

PPN9-Tokyo

The 9th International Conference on the
PPN Chipped and Ground Stone Industries
of the Near East

Programme and Abstracts

Nov. 12–16, 2019

PPN9-Tokyo: Time Table

November 2019

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| 10:20 | | | | | |
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| 15:00 | 3 papers 60 min | 3 papers 60 min | 3 papers 60 min | Move to INTERMEDIATHEQUE | |
| 15:20 | | | | | |
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Preface

The 9th International Conference of the Pre-Pottery Neolithic Chipped and Ground Stone Industries of the Near East (PPN9) is hosted at the University Museum at the University of Tokyo from November 12 to 16, 2019. This international meeting series, originally launched as a small workshop for Neolithic chipped stone industries alone in Berlin in 1993, has since enjoyed significant scientific development among the Near Eastern Neolithic specialists in a friendly atmosphere. In addition, it has seen considerable expansion in research scope, incorporating grinding-ground stone and other stone industries, as well as more general issues necessary to understand the Neolithic phenomenon of the Near East, over the last quarter century. It is our great honor to host this important meeting for the first time in the Far East, a remote region from our research fields but with a solid research community on this subject. We cordially welcome all participants, our friends old and new.

Following the previous meetings, the PPN9-Tokyo aims to provide a forum to combine the latest studies of Near Eastern Neolithic lithics. Proposed presentations from any research discipline and approach—in the form of field reports, material analyses, and theoretical considerations, among others—were accepted, as long as they are concerned with exploiting the analytical potentials of the lithic industries to advance our better understanding of the Near Eastern Neolithic in human history.

A unique point of this conference is that—partly reflecting a general research trend—the geographic location of the venue, and the organizers' interest, an emphasis is placed on regional perspectives to explore the Near Eastern Neolithic developments from the East. We fully understand that the Neolithisation in the regions surrounding the Near East, a supposed "origin" of the Neolithic, should not be viewed as a result of simple dispersals or cultural diffusions in many cases. The increasing research has shown significance in the contributions of the local indigenous communities and interaction with the new, incoming socio-economies. Understanding these processes would shed new light on identifying the Neolithisation practices of the "core" regions in the Near East. Thus, research presentations from the East at the PPN9-Tokyo—including the Iranian Zagros, the Caucasus, and Central Asia, a region whose Neolithic archaeological records have been far less understood compared with that of the West—are most welcome by the organizers.

The PPN9-Tokyo was made possible with numerous institutional and individual supports, without which not only the research presentations but also additional events during the conference would not have been realized. Among too many collaborators to name, the organizers wish to recognize the following sponsors: Resona Foundation for Asia and Oceania, the KAJIMA FOUNDATION, the MEXT-aided PaleoAsia Project, and the University Museum of the University of Tokyo.

Yoshihiro Nishiaki

PPN9-Tokyo Organizing Committee

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Tuesday 12

Drilling tools and perforated items at cultural crossroads

Talia Yashuv and Leore Grosman

The Hebrew University of Jerusalem

The appearance of new perforating tool types during the Natufian, and their increasing frequencies during the Neolithic, suggests the introduction of new perforating techniques. Some have proposed that the Neolithic saw the introduction of faster drilling, with more complex rotational technologies, such as the bow-drill and pump-drill. Here, we present evidence for the intensive use of drilling technology and its associated crafts at the Late Natufian site of Nahal Ein-Gev II (NEG II). We show that fast drilling probably began in the Natufian and that its knowledge fostered the manufacture of additional technologies and artefacts. Moreover, we wish to highlight how the introduction of this new technology reflects the significant changes between the Epipaleolithic and the Neolithic.

The studied assemblage includes a sample of flint perforators and complete perforated stone tools from NEG II. The site, set on the banks of Ein-Gev wadi, east of the Sea of Galilee, is a sedentary village with architecture and a large cemetery, assigned to a single cultural entity of the Late Natufian. One of the aspects that typifies the lithic assemblage is the exceptionally high frequencies of flint perforators. In parallel, groups of new perforated items, mainly disc beads and limestone tools, are manufactured on site.

The research methodology is based on 3D scans and morphological analysis using software developed at *The Computational Archaeology Laboratory, The Hebrew University of Jerusalem*. The 3D data is processed to examine and compare the morphology of the complete artefacts. The scanned holes are analyzed as negative 3D models to study the drilling technology and the nature of the perforated objects' use.

The analysis of the flint perforators shows homogeneity in borer shape, in contradiction with the shape of awls. This regularity of borers may be associated with hafting flint bits in a faster mechanical drill. Perforated tool analysis shows that the traces of bidirectional drilling were uniquely preserved, meaning these biconic holes were not widened by further modification or heavily used. Furthermore, the shape of the holes shows various degrees of asymmetry. We suggest that it indicates the possible use of two drilling systems; manual and mechanical. In general, the results support a possible function for the new Natufian perforated stone tools, which is similar to those involved in textile manufacture.

Our results reveal information regarding the development of drilling technology at a critical state of cultural and economic transformations. Its importance lies for showing how the new technology evolved and how it was applied. Particularly, the relation of fast drilling to the introduction of new crafts connects it to the social process of becoming specialized-based economies. Finally, the development of fast drilling also has a role in the appearance of later rotational technologies, applied in various domains.

Lithic tools involved in stone bead-making during the Pre-Pottery Neolithic: a beads' perspective

Hala Alarashi

Université Côte d'Azur, CNRS, CEPAM

The gradual increase in number, diversity and complexity of stone beads during the Pre-Pottery Neolithic (PPN) indicates constant improvements in skills, work organization and tools. Based on macro- and microscopic observations of beads, and on experimental replications, I will propose a list of lithic tools that were most likely employed in bead-making. Concretely, the manufacturing stages of the most recurrent types in the PPN stone bead assemblages will be addressed along with the potential lithic tools (blades, hammers, anvils, burins, burins spalls, drills, grinding stones, polishers, etc.) used for each stage.

According to the availability of data, I will discuss my proposition through: a) the occurrence of such tools at the studied sites; b) their functions as determined by microwear and functional analyses; c) the evidence of bead production at the studied sites; d) and through ethnoarchaeological examples.

By assessing the diversity of lithic tools involved in stone bead-making, this paper aims to highlight the complexity of stone bead crafts, and so since the beginning of the Neolithic in the Near East. It questions the access to and acquisition of tools – the concept of “tool kit” –, and the emergence of highly qualified and specialized stone bead-makers by the end of the Pre-Pottery Neolithic. Finally, by presenting this beads' perspective of tools, my goal is to engage the reflection further than the drilling issues; within the integral framework of the *chaîne opératoire*. I thereby aspire to reevaluate the importance of stone bead production within the techno-symbolic system of the Neolithic communities in the Near East.

The Stone beads of Nahal Hemar Cave

Daniella E. Bar-Yosef Mayer*, Iris Groman-Yoaroslavski and Naomi Porat

*Tel Aviv University

The PPNB site of Nahal Hemar Cave in the Judean Desert yielded superbly preserved organic remains as well as numerous unique finds such as stone masks and a complete sickle (Bar-Yosef and Alon 1988). Among the various remains were also many beads, made of wood, plaster, shell and stone. The 32 stone beads discussed here were identified as made of an assortment of stones and minerals, including amazonite and turquoise. The nearest source of turquoise is at Serabit el-Hadem in Sinai, and the nearest known source of amazonite is in Wadi Tbeik in the northern Arabian Peninsula. Two items made of carnelian, most likely originated at another distant source based on a detailed technological study that compared it to similar items from the northern Levant. Thus the stone beads testify to the broad geographic range of ties that the occupiers of the cave had with many different groups throughout the Levant.

Reference

Bar-Yosef, O. and D. Alon, 1988. Nahal Hemar Cave. *'Atiqot* 18.

Morpho-metric analysis of arrowheads from Motza and continuity and change in PPNB assemblages

Hamoudi Khalaily*, Kobi Vardi, Avshalom Karasik, Omry Barzilai

*Israel Antiquities Authority

Arrowheads are one of the diagnostic artefact tool types that allow us to attribute the related lithic assemblages to particular phases of the Neolithic based on the stylistic features of each arrowhead as well as the frequency with which they appear within the assemblage. During the ongoing major excavations at Motza, thousands of arrow-heads were found in both the Middle and Final phases of the Pre-Pottery Neolithic B period (MPPNB and FPPN, respectively). Aside from the typological and technological study of these items, the arrowheads are systematically scanned using three-dimensional (3D) technology for morpho-metric analysis. A sample of 500 arrowheads (MPPNB and FPPNB, or what we can also define as the PPNC) and from the previous excavations (E PPNB) were selected for further morpho-metric analysis.

The aims of this current analysis are: a) to examine these tools using multivariate statistical analysis and geometrical-morphological techniques in order to establish their differences in shape, size, and design, and b) to examine their variability over time from the earliest phase of the PPNB to its final phase, and to define those transitional types not only in terms of their form but also in terms of the morpho-metric measurements..

The data obtained from these analyses can allow us to re-examine the type-base division of PPNB arrowheads currently under discussion. An emphasis has been placed on the question of whether there is technological continuity between the M-LPPNB and FPPNB, and to evaluate those ascribed to the FPPNB and their similarity or dissimilarity to arrowheads originating in the earliest phases of the Pottery Neolithic period.

Weapons or hunting tools? Evaluating the role of Pre-Pottery Neolithic B projectile points

Omry Barzilai* and Hila May

*Israel Antiquities Authority

The transition from hunting-gathering to early farming communities in the Near East is often referred in literature as "the Neolithic revolution". This transition was accompanied by the appearance of new lithic technologies as well as introduction of new tools which are associated with agriculture and sedentism (i.e. sickle blades, adzes and axes). One of the 'new' tools that supposedly contradicts the changes in the way of life, is the projectile point that replaced microlithic points of the Epipaleolithic cultures.

Technological studies have raised an interesting phenomenon related to changes in the size of the Neolithic projectile points in time. The early projectile points, dated to the Pre-Pottery Neolithic A period, are small and coexist with microlithic points whereas the points characterizing the Pre-Pottery Neolithic B (PPNB) are larger and wider and display a variety of types. Moreover, in the PPNB period, great emphasis is made on raw material selection, specifically on glossy pinkish-purple materials. Investments are made in shaping the formal design by employing pressure flaking. With the transition to the Pottery Neolithic period the projectiles are small-sized again, although typologically the same types continue to exist.

Nevertheless, the reasons for these changes remained an enigma: are they functional? cultural? or related to other reasons? Examination of characteristics of the material culture of the Pre-Pottery Neolithic B suggests that the reasons for enlarging the dimensions are not necessarily related to subsistence economy but rather to social ones, and in some cases could be related to warfare.

Arrows and archery during the PPNB, an experimental approach: points production and use

Frédéric Abbès* and Fiona Pichon

*CNRS, UMR 5133 Maison de l'Orient et de la Méditerranée

Hunting is a complex activity involving fundamental social and symbolic aspects. Ethnography shows that, in many societies, the hunter is socially valued and that some hunts, according to the technique used and the type of prey sought, are also recognized, even ritualized, by the community. This practice may also reflect a social distinction between men and women or/and between social and cultural groups. Until now, prehistorians have rarely discussed these aspects of hunting. This is due to the difficulty of interpreting archaeological data as well as to the history of research that favored other types of approach to prehistoric societies.

During the neolithisation, fauna remains demonstrate the exploitation and consumption of various animal species and show sometimes strategies implemented for their acquisition (periodic huntings, gathering of entire herds). But, these last one leave few traces, as well the values and the rules that regulate this activity are often invisible to the archaeologist. Some indications, such as the apparition and superproduction of points since the 10th millenium, the deposit of bucrania and scapula of aurochs and the artistic representations of the hunter, are showing a new conception of the hunting, more symbolic with the affirmation of a masculine entity. Changes in the way of perceive the wild world express also in the multiplication of animal representations. This raises the question of the status of hunting in these Neolithic societies, whose economic and social organization is gradually be based on agriculture. It is indeed at the moment when hunting is no longer the fundamental element of the survival of prehistoric groups that its status seems to evolve and that, paradoxically, it seems to be magnified by artistic representations and a particular care in the production of the arrows.

In this communication, we adress this problematic with an unprecedented approach for the near-eastern Neolithic : the function of arrowheads. We will present the first results of an innovative programm of experimental archery, specifically dedicated to a type of arrowhead: the Byblos point. By identifying the production and transformations methods, hafting modes and diagnostics usewear traces of hunting activity (impact traces), this framework will refine the technical and functional interpretation of archeological arrowheads and, in term, permit to better understand the social and symbolic meanings of the hunting.

The flint daggers from LPPNB Ba`ja

Hans Georg K. Gebel*, Christoph Purschwitz, Denis Stefanisko and Marion Benz

*Free University of Berlin; ex oriente

The pressure-flaked and denticulated flint daggers from Ba`ja represent a most distinguished and rarely attested class of artefacts, allowing significant insights into specialized procurement and technologies, demand networks, hierarchies, symbolic behaviour, and other. They are distinguished for their raw material from the eastern steppes, their non-local and highly specialized production, their primary contexts as –most probably unused– grave goods, and for their traces of intentional breakage related to burial rites. A preliminary replicative study confirms a technological know-how not attested with the site's household levels in flint technologies. The presentation of the Ba`ja daggers includes the related current discussion in our Household and Death in Ba`ja – Project on LPPNB hierarchies and identities, on symbolic properties and (ex-) commodification.

The heat treatment of flint in the Early Pre-Pottery Neolithic B site of Motza (Judean Hills, Israel)

Dmitry Yegorov*, Ofer Marder, Hamoudi Khalaily and Steven A. Rosen

*Ben-Gurion University of the Negev

Unaided eye observations of the lithic assemblage from the Early Pre-Pottery Neolithic B (EPPNB, 8,600-8,200 cal. BC) layer of Motza in the Judean Hills (Israel) have revealed a large number of flint artifacts. Some of these items show visual features usually associated with intentional heat treatment. Controlled thermal annealing of siliceous rocks is an ancient pyrotechnology known in different parts of the world. It was frequently employed during the initial stages of a reduction sequence for the improvement of raw material knapping properties. However, the observations of the assemblage from Motza indicate that heat treatment was carried out during different stages of reduction sequence (e.g., heating of cobbles, cores, and blanks). Due to the presence of visual heat treatment features among different debitage groups, it may be assumed that at least some of the heat treatment events were performed on the site.

On the one hand, annealing of flint cobbles and cores was probably intended for the improvement of quality of raw material, aiming to optimize its utilization during the all stages of knapping process. On the other hand, heating of blanks was probably intended to facilitate pressure retouch during the final stages of tool modification, also ultimately leading to visual changes in the final appearance of the artifact, perhaps rendering the artifacts more attractive.

Auroch horns in Natufian occupational context at Ein Qashish South, Jezreel Valley, Israel: implications for the understanding of site function and symbolic behavior of the last hunters-gatherers in the Levant

Alla Yaroshevich*, Elizabeta Boaretto, Noam Greenbaum,
Yoel Roskin, Naomi Porat and Valentina Caracuta

*Israel Antiquities Authority

It is widely accepted that certain aspects of the lifestyle defining the first agricultural communities of the early Neolithic in the Levant have their roots in the Natufian the final Epipaleolithic culture of complex foragers. Natufian novelties include establishment of sedentary settlements, certain technological inventions as well as flourishing of symbolic expressions.

The recently excavated stratified site Ein Qashish South, Jezreel Valley, yielded three layers of Natufian occupation overlaying Middle and Early Epipaleolithic deposits. Intriguingly enough, Natufian layers revealed no signs of substantial settlements such as known from neighboring contemporary sites located on Mt. Carmel. Instead, well-defined spatially differentiated features were unearthed, among them stone arrangements incorporating complete auroch horns, associated with the earliest Natufian layer at the site. The flint assemblage associated with this layer includes lunates with bifacial (Helwan) and abrupt retouch. This feature is of importance considering the radiocarbon dates indicating co-existence of the earliest Natufian occupation at Ein Qashish South with the neighboring Raqefet and el-Wad Terrace – two sites defined by different technological traditions.

The auroch horns from Ein Qashish South, accompanied by differently shaped lunates alongside the radiocarbon dates that suggest co-existence with the neighboring base camps, raise intriguing new hypotheses regarding the function of the site. Presumably short-term activities were involved that related to auroch hunting and associated rituals performed by different social groups. These new hypotheses are aligned with previous finds of a symbolic nature connecting the Natufian hunter-gatherers with the first farming communities of the succeeding Neolithic, the period in which the auroch or bull occupied an important position.

The Natufian: burials as a cultural marker

Leore Grosman* and Anna Belfer-Cohen

*The Hebrew University of Jerusalem

We wish to provide an updated overview of the Natufian burial practices from its earliest phases to the latest. Special emphasis will be given to the architectural elements of constructing the graves, grave goods, positioning of the burial, etc. as we believe that all those characteristics indicate the role of burials as markers of the profound social change which took place during the Natufian. Indeed, burials can be considered as the best proxy for the profound changes in the lifeways and economy that took place in the Natufian, reflecting aspects of both ritual and mundane behaviours, as well as portraying particularities of specific Natufian groups, a feature that was hard to discern in preceding local cultural entities.

Detailed examples will be presented from the burial grounds uncovered at Hayonim and Hilazon Tachtit caves as well as at the open-air site of Nahal Ein Gev II. Those three sites encompass the entire Natufian time-span, enabling observations vis a vis the typical, overall, Natufian features as well as the changes that occurred with time and differing circumstances. The detailed study of Natufian burial-grounds provides yet another venue for exploring the transformations that took place during the ca. 3,500 years of the Natufian existence, nowadays considered an integral part of the long-durée Neolitization processes and all that it entails.

Preliminary results from a functional analysis of Natufian chipped stone tools from Shubayqa 1, Jordan

Anne Jörgensen-Lindahl

University of Copenhagen

The Epipalaeolithic-Neolithic transition in southwest Asia has been investigated intensively for many decennia. Archaeologists have sought to identify the underlying reasons that caused the shift from hunting and gathering to agriculture, and have put forward environmental, demographic, social and cognitive factors. More recently, scholars have increasingly focused on the role of food, especially feasting, as a possible contributor to the socio-economic transformations that characterized the transition from the Natufian to the PPNB.

Chipped stone artefacts have been studied extensively during these periods, and micro-wear analysis has proven a powerful tool for determining their function, subsequently defining activities and contact materials. The micro-wear studies carried out so far have greatly contributed to our knowledge about this transition. However, most micro-wear analyses were concerned with a rather narrow range of tool-types, mainly focusing on sickle-blades. This has resulted in a gap in our understanding of the full range of performed activities, as well as of which resources were being exploited. Consequently, many steps in the *chaîne opératoire* of past behaviours are still unclear.

In this presentation, I will argue that the incorporation of a larger variety of tool-types into micro-wear studies would be helpful in the investigation of the Epipalaeolithic-Neolithic transition. From a better understanding of the variety of activities carried out and what different materials were being exploited throughout the transitional period, temporal changes within the process may be detected. Such changes may in turn be used both for the reconstruction of various *chaîne opératoires*, but also for the study of the driving factors behind this socio-economic shift. As an initial contribution, the results of a micro-wear analysis of late Natufian chipped stone tools from Shubayqa 1 (14,400 – 11,600 cal B.P.), Jordan, will be presented and discussed.

On the edge of sedentism at the northwestern Negev dune-fields and subsistence strategies during the Middle to Late Epipaleolithic: the Ashalim chipped stone assemblages

Lotan Edeltin*, Ofer Marder and Jacob Vardi

*Ben-Gurion University of the Negev

A multi-cultural site was discovered on a 4 m high and 100 m wide linear dune at Ashalim site in the northwestern Negev. During the Late Pleistocene, sands from Sinai and the Nile delta were deposited in the northwestern Negev, due to long-term aeolian activity generated by the Cyprus low cyclonic systems. This deposition resulted in the formation of seasonal standing water bodies caused by sand blocking wadi beds, which enabled flowing of winter rains into seasonal water bodies as is documented at the northwestern Negev site of Ashalim.

Techno-typological analyses of eight chipped stone assemblages, systematically collected from this dune system, indicate that the site was occupied during three phases of the Middle to Late Epipaleolithic period: the Geometric Kebaran, the Late Natufian and the Harifian. The thin accumulations as well as tool-type frequencies, often dominated by microliths, suggest short-term, task-specific occupations in direct proximity to seasonal water bodies at Ashalim site. Similar sites are known from other localities in the Negev and Northern Sinai. This reflects the importance of this region to different Epipaleolithic hunters-gatherers who exploited it on a seasonal basis. Meanwhile, in the Mediterranean zone, semi-sedentary/sedentary communities had been established.

The lithic industries of Nahal Efe and the PPNB of the Negev

Ferran Borrell* and Jacob Vardi

*Spanish National Research Council (IMF-CSIC)

The long-term Israeli-Spanish research project at Nahal Efe is focused on the study of the Neolithic developments in the Negev desert during the Pre-Pottery Neolithic (10th–7th millennia cal. BC). This is a region with a particular evolution that differed from the mainstream Neolithization processes observed in the neighbouring core regions (Mediterranean region and Transjordan). The project is also aimed at refining our understandings of social interaction between the foragers of the Negev and the neighbouring farming communities and, secondly, at reconstructing human-environment interaction in the southern Levantine arid regions. In order to achieve the goals of the project, we have focused on the extensive excavation of what has revealed to be one of the largest and best preserved PPNB sites in the Negev, thus providing a range of new data on the evolution of cultural dynamics during the 9th to 8th millennia cal. BC transition in the region.

The site, which extends for over 2000 square metres, is located in the northern Negev highlands, close to the Mediterranean Judean hills and only 10 km south of the well-known cultic-cave of Nahal Hemar. The main occupation of the site can be dated in the Middle PPNB, around the first half of the 8th millennium cal. BC. This occupation corresponds to a cluster of relatively large sub-circular stone buildings located on different levels at the top of the hillside. To date we have excavated two buildings (Unit 1 and 2), part of a third (Unit 6) and delimited three more (Units 3, 4 and 5), constituting a residential area unique in the region. In addition, several more circular structures (more than twenty) are partly visible on the surface.

The excavation of the habitation units excavated has so far yielded a relatively abundant chipped lithic assemblage as well as other stone tools such as basins, bowls, and shaft straighteners. The representation of fauna is limited, while botanic remains are well preserved and abundant, thus allowing refined radiometric dating of the Neolithic settlement.

In this paper, we present the preliminary results of the study of the chipped lithic assemblage from the 2015–2018 seasons, corresponding to the Middle PPNB occupations of the site, dating to the first quarter of the 8th millennium cal. BC. The techno-typological examination of the abundant chipped industry allows full characterization of stone tool production and use at the residential site of Nahal Efe. In addition, the presence of a notable component of bidirectional blades and cores at the site provides interesting insights into the chronology and nature of the diffusion and adoption of this technology in the southernmost arid margins of the Southern Levant.

Investigations at Naḥal Roded 110: a Late Neolithic ritual site in the southern Negev

Michal Birkenfeld*, Liora Kolska Horwitz and Uzi Avner

*Israel Antiquities Authority

In the southern Negev, about 370 mountain localities (called ‘Rodedian’ sites) have been identified and surveyed. These sites contain unique finds (cal low stone-built installations and cells, standing stones, perforated stones and stone bowls) and have been previously attributed to the Early and Late Neolithic. One such site, Naḥal Roded 110, situated about 6 km north-west of the city of Eilat, was excavated in December 2017. The site covers about 150 m² and lies at an elevation of 420 m asl within a small, igneous rock embayment. First surveyed in 2004, flint and ritual stone objects were found on the surface, and a collapsed structure and hearth identified. Excavations were conducted to assess the site’s chronology, material culture, organic remains and spatial layout to elucidate site function and paleoclimate.

The excavation at Naḥal Roded 110 has yielded many surprises: a large ashy deposit, indicating numerous, repetitive occurrences of pyro-activities, extensive evidence for on-site flint knapping, remarkable preservation of organic remains and an abundant faunal assemblage, exclusively comprised of birds of prey. Four 14C samples as well as OSL dating confirm the attribution of the site to the Late PPNB. This conforms well to the lithic assemblage’s technological properties. These as well as the remarkable faunal assemblage and other site elements will be presented in this talk. Clearly, Naḥal Roded 110 contains physical and non-physical elements that are unique, even when compared to coeval desert sites. The discoveries emphasize the enormous potential of further investigations at this and other Neolithic sites in the region.

A Late PPNB lithic assemblage associated to kite hunters from Jibal al-Khashabiyeh, southeastern Jordan

Rémy Crassard*, Juan Antonio Sánchez Priego, Wael Abu-Azizeh and Mohammad Tarawneh

*CNRS, USR 3141 'CEFAS', Kuwait City

Since 2014, the South Eastern Badia Archaeological Project has been surveying and excavating numerous Neolithic sites. These sites are specifically related to the use of the eight desert kites laying on Jibal al-Khashabiyeh. A series of dwelling structures have been systematically found in association with the mega-traps. Beyond the excavation of three kites, three occupational sites have been excavated: F15, F19 and P52, all dated to approx. 7000 cal. BC (Late PPNB).

While F15 was too disturbed to perform a more detailed field work than just a sounding, the site of F19 was excavated in its entirety: the subterranean circular mono-cellular structure yielded an abundant lithic corpus, with a wide range of other artefact categories and a good amount of well-preserved faunal remains. From 2016, the still-ongoing excavation in P52 site has been revealing more complex multi-cellular structures with an amazing amount of gazelle bones, the most likely remains of communal mega-trapping seasons made with the desert kites. The material culture is rich and varied at the three sites, with a particular titanic amount of lithics at P52.

The comparative studies of samples from these assemblages show compelling closed similarities in terms of typology, technology and of general proportions of classes within each lithic series. Although bidirectional cores and blades are rare but present, unidirectional blades and to a lesser extent bladelets represent the main production with a substantial bifacial production of thick elongated foliates. The local raw material, a good quality chert that is present everywhere over dozens of square kilometers is almost exclusively used; local Bedouins call this region today Ardh as-Suwan: the land of the flint. Projectile points are frequent, although often made out of exogenous fine-grained cherts. Other retouched tools are rare if not absent and only few burins have been discovered. With the association to F15 site's assemblage and to other studied surface sites in the surroundings, we suggest that this highly homogenous lithic tradition constitutes a new lithic technocomplex that we call the Ghassanian. Our discoveries, in stratified and well-dated contexts present particular components (blade production modalities, arrowheads, bifacial pieces, etc.) that can be related to the material culture as a whole including other artefacts (ornaments, symbolic products, osseous technology, grounding and percussive stones, etc.), architecture, and hunting economy related to the desert kites. This PPN9 conference in Tokyo will be a good opportunity to debate and compare this lithic material with all participants and to evaluate the pertinence of our proposition.

Wadi Sharma 1 and the Hijaz PPNB: new insight into the Neolithization in NW Arabia

Sumio Fujii
Kanazawa University

Wadi Sharma 1 is a small-scale settlement site on the north bank of a narrow valley plain that leads to the northeast coast of the Red Sea. Our recent excavations revealed a linear settlement composed of some sixty masonry structures of various sizes and plans. The flint assemblage from the structural complex is characterized by the predominance of Amuq type points and the substantial absence of the naviform core-and blade technology. A dozen C-14 dates converge on the second half of the 8th millennium calBC, corroborating that the settlement dates back to the Late PPNB.

This paper reviews the results of excavations at the key site and discusses the Neolithization in NW Arabia in a local context. Another four sites newly found in the same region provide additional data for the discussion. To begin with, Musayyin yielded a bladelet-oriented flint assemblage centering on el-Khiam and Helwan types points together with round to oval, semi-subterranean structures, which suggests that the Hijaz PPNB potentially dates back to its Middle or even Early phase. This makes sense in view of increasing relevant research data from southern Jordanian Badia and northern Arabia. Meanwhile, what immediately followed Wadi Sharma 1 is al-'Aynah, where a flint assemblage similar to that from the key site was attested together with two C-14 dates suggestive of a Final PPNB date. These findings suggest that overall, the Neolithization in the NW part of the dry sub-continent can be understood within the chronological framework of the southern Levant, especially its surrounding drylands including the al-Jafr Basin, southern Jordan. The occurrence of *flint bowlets* from Wadi Sharma 1 and al-'Aynah also illustrates that the Hijaz PPNB was incorporated into the trade network in the contemporary southern Levant. The same is also true of its aftermath. The findings of linear-settlement-shaped open sanctuaries also called *pseudo-settlements* at Wadi Ghubai 11 and 13 indicates that the subsequent Neolithization in NW Arabia also advanced hand-in-hand with the marginal drylands to the north.

Wednesday 13

PPNA and PPNB lithic industries at Kharaysin (Jordan)

Juan José Ibáñez, Ferran Borrell and Ignacio Clemente

Spanish National Research Council (IMF-CSIC)

The recent archaeological fieldwork at the large Pre-Pottery Neolithic site of Kharaysin (Zarqa Valley, North Jordan) has revealed one PPNA and three PPNB architectural phases. Phase 1 is dated to the end of the 10th and the beginning of the 9th millennia cal. BC, corresponding to the PPNA occupation of the site, with oval sunken dwellings with mud and lime plastered floors. Phase 2, attributed to the late Early PPNB, is dated in the second half of the 9th millennium cal. BC. At that time architectural structures consisted of contiguous houses sharing intermediate walls, rectangular rooms with rounded corners, plastered floors and walls, and central round fireplaces. In Phase 3, corresponding to the Middle PPNB and dated to the beginning of the 8th millennium cal. BC, rectangular houses were arranged parallel to one another, with internal divisions, plastered floors and burials inside the houses. Phase 4, dated at the end of the 8th millennium cal. BC, during the Late PPNB, has been detected in a test sounding in the upper part of the site.

In this paper, we present the preliminary results of the techno-typological analysis of the abundant chipped industry recovered at the site. In this sense, the long and almost unique (for the Southern Levant) occupational sequence at Kharaysin allows full characterization of stone tool production and use during the PPNA to PPNB transition, thus providing interesting insights into the evolution of lithic production during this still poorly understood period in the region. In addition, the results shed light on the chronology of the dissemination of bidirectional blade technology to the Southern Levant.

A new Early Pre-Pottery Neolithic B site at Nesher-Ramla Quarry, Israel

Micka Ullman

The Hebrew University of Jerusalem

A small PPNB site (ca. 10 m² and 5 m deep) was discovered in a karstic sink-hole in 2015. Located close to the border between the coastal plain and the central hills, systematic excavations at the Nesher-Ramla Quarry site revealed abundant finds, all relating to a single Neolithic phase. They include chipped flint and limestone, ground stone, faunal (including micro-faunal), bone tool, sea shell and bead, baked clay, botanical (including fava beans, lentils) and anthracological assemblages. A partial human skull was also found. Some of the stratified sediments displayed clear evidence for exposure to high temperatures; micro-morphological analyses indicated that they are associated with in situ pyro-technological activities probably focused on lime plaster production. C14 dating of short-lived botanical remains indicate occupation only during the Early PPNB, about 10,400 cal BP.

The results expand our documentation of the EPPNB in the Southern Levant, including sites such as Kfar HaHoresh and Motza. Though limited in scope, the diverse archaeological finds recovered from Nesher-Ramla Quarry add new dimension to our understanding of the period, as the material culture remains appear to reflect a unique combination of activities that include domestic, industrial and probable symbolic affinities.

Different strokes for different folks? Comparing the flaked-stone assemblages from the Neolithic sites of 'Ain Ghazal and Wadi Shu'eib

Theresa M. Barket
California State University

While broad similarities exist in core technology and common tool types considered typical of the Neolithic of the Southern Levant, most researchers recognize some amount of variation in lithic assemblages. How much variation is recognized and how it is interpreted, however, differs significantly, and, because evidence from flaked-stone assemblages continues to play a key role in interpretations of social organization and interaction, it remains important to continue to carry out detailed site-level analyses. Unfortunately, few comprehensive studies come from the larger settlements with long occupation spans that are likely to be informative about patterns of long-term social and economic change. It is clear, however, from the detailed research at the long-occupied site of 'Ain Ghazal, Jordan that changes in the flaked-stone assemblage track with alterations in subsistence, settlement size, and settlement configuration. Whether similar patterns are present at other sites with long occupation spans (2,000 years of continuous occupation) has not been fully examined. Therefore, this study aims to address some of these gaps in our knowledge by expanding on the initial research done on the flaked-stone assemblage from the site of Wadi Shu'eib (Simmons et al. 2001), a large Neolithic settlement in Jordan occupied from the Middle Pre-Pottery Neolithic B to the Pottery Neolithic. Specifically, this paper presents the results of a technological analysis of the core assemblage, a sample of the flake and blade debitage, and some additional analysis on the tool assemblage including consideration of blank choice and evidence of recycling and reuse. The results are then compared to what is known for 'Ain Ghazal, to identify sources of variation in the socioeconomic changes of each site through time. Finally, it situates the results of this comparative research with what is known from other contemporary Neolithic settlements.

Intra-site variability in the Pre-Pottery Neolithic B site of Yiftahel: lithic techno-typological analyses

Avraham Levy

Ben-Gurion University of the Negev

During the 2007–2008 salvage excavations at the Pre-Pottery Neolithic B (PPNB) site of Yiftahel (Lower Galilee) new segments of the village were excavated. In Area G (to the south) and Area I (to the north) exposed were several buildings with plastered floors and rich lithic assemblages featuring products of the bidirectional technology.

Lithic assemblages from two buildings were selected in order to examine the intra-site variability in the village: building 501 in Area I and building 200 in Area G. By analyzing the chipped stone assemblages within these structures, we attempt to determine the function of the buildings and to examine the internal social organization of Yiftahel during the PPNB.

Preliminary results of this study show that there are chronological and social differences between the two buildings. Building 501 and building 200 are related to two different phases of the PPNB sequence at Yiftahel. This is based on the appearance of the arrowhead points in building 501 and building 200. Jericho and Amuq pointes are dominated in buildings 501 and Byblos point are dominated in building 200. this may imply that building 200 related to later phase in the PPNB sequence at Yiftahel. Another result of this study is the difference between the activities that were conducted inside the two buildings. The rich lithic assemblage of building 501 is a result of intensive knapping that may signify a chipped stone workshop where bi-directional blades were produced. The flint assemblages in building 200 is less dense and bi-directional blades and arrowheads are not common. This, and the higher number of burnt flint artifacts compared to building 501 may suggest that the assemblage represents domestic activities.

Nahal Yarmuth 38: a new PPNB and PN site in central Israel

Anna Eirikh-Rose*, Katia Zutovski, Hai Ashkenazi and Avi Gopher

*Israel Antiquities Authority

The recently uncovered Neolithic site of Nahal Yarmuth 38 located in the inner part of central Israel between Jerusalem and Tel Aviv. Extensive salvage excavations carried out there in 2017–2018 exposed a total of c. 700 m². The stratigraphy consisted of a Pre-Pottery Neolithic B (PPNB) layer at on bedrock/virgin soil and a Pottery Neolithic (PN) layer on top.

The PPNB layer consists of a unique series of rectilinear structures with plastered floors beneath which, multiple interments were found. According to the finds it can be assigned to the Middle PPNB (MPPNB).

Five square (5–6,5 m long) structures with lime plastered floors were exposed with up to five phases of floor repair were detected. Remains of red and black paint were found on some of floors, but no clear patterns could be charted. A plastered ‘tunnel like’ feature of yet unclear purpose was found in Structure V. The floors were generally ‘clean, with almost no finds on them apart from single flint items and, rarely, a (late, post-floor) burial.

Some 40 individuals were excavated in the PPNB layer, mainly under the plastered floors, in pits, some of which have shown signs of opening and closing. All individuals were in flexed or semi-flexed position, except for one single burial of a child in a sitting position. The majority of the skeletal remains were found in primary burials of a single adult individual. Three multiple burials included one with two adults in flexed position facing each other and two with adults and a child and/or a newborn. Grave good were found in a few of the burials.

The PPNB layer yielded rich assemblage including knapped flint items, groundstone tools and a few bone tools, as well as faunal remains and hundreds of marine shells. The lithic assemblage includes typical MPPNB arrowheads and sickle blades, but no bidirectional cores were noted and no bifacial tools. Other finds include a variety of bone and stone beads and pendants, worked marine shells, a single anthropomorphic stone imagery item and a broken gaming board.

The Pottery Neolithic (PN) layer is assigned to Lodian/Jericho IX culture. This layer was uncovered only in the western part of the excavation. The architecture of this layer consists on only two stone walls of two different phases and their use is not clear. PN stone surfaces composed of small and medium-sized stones were exposed. In some cases, it was possible to identify a rectangular outline to these stone surfaces, probably the infrastructures of a floor for a built feature, may be built of mud bricks. Several burnt mud bricks were exposed. One primary burial in flexed position can be clearly associated with the PN layer. The PN assemblages consist of typical pottery vessels, flint artifacts and faunal remains. A fragment of a clay figurine was also uncovered.

**Aspects of techno-typological change in sickle blades from the PPNB to the EBA:
a socio-economic view based on Ha-Goshrim, Nahal Zehora II, Ein Zippori, and
Nahal Yarmuth 38, Israel**

Katia Zutovski
Tel Aviv University

During the time span between the Pre-Pottery Neolithic (PPN) and the Early Bronze Age (EBA) far-reaching changes of tremendous significance took place in the southern Levant. These, beginning with the Neolithic Revolution, encompass the domestication of plants and animals and the beginning of a food production-based economy, a shift of settlement patterns and an established rural landscape, at some point in this time, the beginning of pastoralism of mobile herders in the peripheral areas, an array of new technologies including the appearance of pottery and later metallurgy, and finally the Urban Revolution – i.e., the foundation of cities in the beginning of the EBA.

The analyses of technology, typology and function of stone tools (including raw material procurement strategies and preferences) from these periods has the potential to reflect these changes and highlight aspects of subsistence economy, crafts and craft specializations, gender relations, social organization, perceptions and discourse.

This study is part of a doctoral thesis focusing on changes between the Neolithic Revolution and the Urban Revolution in the southern Levant, from a lithic perspective. Here I will present insights from the sickle blades analysis. The main goal is to find out what are the implications of changes in sickle blade traits identified and defined through a techno-typological analysis along the studied sequence. This goal was achieved in four steps:

1. Detailed techno-typological and raw material analysis of sickle blade assemblages from the sites of Ha-Goshrim, Nahal Zehora II, Ein Zippori, and Nahal Yarmuth 38, Israel, spanning from the PPNB to the EBA. This analysis was fortified by published accounts from other sites within this time span.
2. The 'traits model' - sickle blades' attributes examined (e.g., properties of the working edges, backs, ends, and many more) were chronologically plotted revealing trends of change through time. For instance a tendency of deep denticulation which begins in the PPNC, reaches a peak in the PN Yarmukian, and then gradually declines towards the EBA.
3. In searching for possible explanations to the identified techno-typological changes, a multi-disciplinary approach was applied. Production and specialization requirements were tested; functional aspects of hafting and harvest efficiency derived from published accounts on archaeological sickles were consulted, as well as use-wear analyzes, harvest and threshing experiments, and ethnographic studies; botanical remains were considered too; and finally cultural and perceptual aspects as reflected in the material culture of each period. All these were plotted against the identified changes in sickle blades characteristics.
4. Evaluation of the results and formulation of the likely implications of the techno-typological and raw material changes in sickle blades.

I believe that a multi-disciplinary approach encompassing a broad array of lines of research can contribute to a better understanding of the role of lithics in Neolithic, Chalcolithic, and EBA societies, and to disclose the way in which lithics reflect socio-economic and cultural changes.

Entangled in lime: a contextual materialistic examination of the multi layered plaster floors at PPNB Nahal Yarmuth 38

Dana Ackerfeld*, Anna Eirikh-Rose, Hai Ashkenazi, Katia Zutovski and Avi Gopher

*Tel Aviv University

The PPNB of the Southern Levant is known for its exploratory and extensive use of plasters, especially lime plaster. Human societies of the PPNB went through dramatic changes in their lifestyle and moved into an agriculture-based producing economy and large sedentary settlements. The use of plaster in known form PPNB sites throughout the area, mostly from buildings' floors, but also from other architectural features (walls, niches, pits, etc.). Alongside architectural applications, plaster was the raw material used for plastered skulls, figurines and sculptures, 'white ware' vessels, beads, and more. Plaster as a material with its specific physical characteristics was a well-known element in the life of these early farming communities.

Human activities have taken place, above the floors themselves, which were sometimes painted, burnished and often re-plastered. Most interesting is the fact that beneath the floors were cached objects, most commonly burials. Plaster floors may have gained an important role in both human's life and death.

This research follows studies examining material culture as a whole and its connections to people via an entanglement and Actor Network Theory perspectives¹⁾. It aims at a definition of the type and quality of relationships people had with plaster as a material, and the symbolic (and ideological) make up it contained. After collecting and analyzing available data concerning plaster floors of the southern Levant PPNB, this presentation will focus on the higher resolution provided by the case of Nahal Yarmuth 38 excavations.

Nahal Yarmuth is a PPNB-PN site in central Israel that was salvage excavated between 2017–2018. The PPNB layers of the site exposed five square structures with white plaster floors and multiple re-plastering events. Burials of single individuals or groups were found mostly beneath the floors and in single cases above the floor. The site enabled to examine the plaster-entanglement in human life (and death?). The amount of burials, their variability and the absence of the expected material culture of a residential site may perhaps suggest that Nahal Yarmuth 38, and sites like Kfar HaHoresh²⁾ should be assigned to a new category – one that encapsulates the entanglement of humans and stone, humans and lime, pyrotechnology, life, and death.

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Household-level lithic production and knowledge transfer at LPPNB Ba'ja, southern Levant: first results

Christoph Purschwitz
Free University of Berlin

The end of the late PPNB in the Southern Levant is marked by the general decline and eventual abandonment of formalized bidirectional blade core technology. At the same time less formalized to non-formalized core reduction and tool production strategies receiving became more and more important within the lithic household economies. This presentation summarizes the first results of our research on household-level lithic production and knowledge transfer at LPPNB Ba'ja which is embedded within the current Household and Death in Ba'ja – Project (2018–2021). Dumps of lithic household-level production context from various excavation areas have been included in the study and were analysed for their typo-technological composition. Identified core reduction and stone tool production technologies were checked for their intra-site distribution and diachronic developments in order to investigate how technical knowledge was transferred at Neolithic Ba'ja. As well we analysed knapping accidents to explore the skill level spectrum, which can be found among various contexts and used technologies, and is used to obtain information on the relevance of lithic production in the daily household practice.

The lithic assemblage of Eh-Sayyeh and the PPNC of northern Jordan

Dörte Rokitta-Krumnow
German Archaeological Institute

The Neolithic site of eh-Sayyeh in Northern Jordan, located c. 25 km northeast of Amman, has been first investigated in the early 1990s. New excavations by the German Archaeological Institute and the Hashemite University/Yarmouk University have been undertaken between 2013 and 2015 and revealed a site of ca. 11 ha in size, probably with shifting settlement. The site is situated at the confluence of the small Wadi adh-Dhulayl and the year-round water-bearing Wadi Zarqa. The main phase of occupation dates to the first half of the 7th millennium BC.

Eh-Sayyeh sheds new light on the understanding of the final phase of the Early Neolithic (so-called PPNC) and the transition to the Late Neolithic (Yarmoukian) along with the early appearance of ceramics and the development and changes of the lithic industry. The paper summarizes the development of the chipped lithic industry in comparison with other contemporaneous sites in the southern Levant.

The Final Pre-Pottery Neolithic B mega site of Motza (Judean Mountains)

Jacob Vardi* and Hamoudi Khalaily

*Israel Antiquities Authority

During the past year, large-scale excavations have been carried at the site of Motza in the Judean Mountains, west of Jerusalem. The site extends over an area of about 30–40 ha of which 1.5 have been excavated during 2018–2018. Most the architectural complexes revealed to date are attributed to the Final Pre-Pottery Neolithic B phase (hereafter FPPNB, roughly 7100–6600 cal BC), a period previously unknown in the Judean hills. Middle-Late PPNB (MPPNB, 8000–7100 cal BC), Pottery Neolithic, Chalcolithic, and other protohistoric periods were also uncovered, but extend over a smaller area.

Several MPPNB structures were uncovered in various locations of the site. They have a squared plan and they are sometimes divided into smaller rooms. In all of these cases, the central room has a plastered floor with evidence for re-plastering. The MPPNB structures also include plastered installations, some of which cut the plaster floors. Most of These plastered floors were red painted.

With respect to the FPPNB, the compounds include several habitation units. Passageways between houses and between the compounds were uncovered, some paved with cobbles and earth. The architectural units include rectangular rooms, small square or rectangular cells, and narrow corridors resembling features reported from sites in Transjordan.

The lithic assemblage includes thousands of arrowheads, mainly medium size Amuq points, denticulated sickle blades, and bifacial knives and axes. The ground stone assemblage includes thousands of stone rings or bracelets, some of them directly related to the burials of the PPNB (see below).

The fauna from the site is dominated by domesticate caprine, forming two thirds of the identified specimens, followed by cattle, and wild and domesticated pigs. Other specimens of wild game appear, but in lesser quantities.

The botanical remains include numerous charcoal remains of *Amygdalus*, *Quercus* and *Pinus*. Seeds were found in two silos and on plastered floors. Most of the seeds from one of the pits were identified as *Lens culinaris* (lentils). Five radiometric dates from seeds and from a bone yielded results that fit into the time frame of the FPPNB, i.e. the end of the 8th millennium and the first third of the 7th millennium BCE.

A profusion of burials was uncovered at the site. They are usually in flexed position. The preservation of the burials is good and there is a good identification of age and sex. Burials of children and juveniles were found also. Most of the burials include one individual and as although some can be described as burials of groups. One fifth of the burials include ornaments, among them bracelets.

It seems that the site of Motza was not abandoned during the MPPNB and that the FPPNB settlement might have been evolved from the previous occupation. The salvage excavations at Motza have uncovered one of the largest mega-sites of the PPNB period, and its discovery changes previous conceptions about the evolution of the PPNB period in the southern Levant.

The elusive Neolithic occupation of 'En Asur, central Israel

Lena Brailovsky* and Dina Shalem

*Israel Antiquities Authority

The site of 'En Asur ('En Asawir) is located in the northern Sharon Plain at the outlet of Nahal 'Iron. It was excavated in a series of small to medium-scaled salvage excavations during the last 30 years. The renewed mega-salvage excavation project at the site is on-going since January 2017 on behalf of the IAA (during which approximately 41.5 ha. of land will be excavated).

The main strata exposed are: the remains of a vast urban Early Bronze Age Ib settlement; A small Early Bronze Ia settlement; Remains of a Late Chalcolithic (Ghassulian culture) occupation; a large Late Pottery Neolithic/Early Chalcolithic village (a phase plausibly related to Late Wadi Rabah culture), extending over 35-40 ha.; and sporadic finds of Early Pottery Neolithic (Yarmukian and Jericho IX cultures) and Final and Early Pre-Pottery Neolithic.

The Late pottery Neolithic village consists of at least three occupational phases –1.5 m. in depth– and includes: rectangular stone-based structures, stone paved floors, a wide range of installations, on-site burials of adults and infants, and a large assemblages of pottery, flint and fauna. The earlier occupations –the Early Pottery Neolithic and the Pre-Pottery Neolithic– are more modest in size and density, and therefore the nature of these earlier layers remains for the time being unclear.

In our talk we will present the flint assemblages of the different Neolithic layers, focusing on the various technologies and formal tool types. Our results will be analyzed compared with those from the past excavations at the site. Via the presented data we hope to portray a clearer picture of the nature of the earlier occupations at the site.

Architectural planning and geometric regularities in Natufian and PPN architecture: case studies from the southern and northern Levant

Gil Haklay* and Avi Gopher

*Israel Antiquities Authority; Tel Aviv University

We argue that the roots of architectural planning are well planted in prehistoric times, and that in the Levant, the fundamentals of architectural planning have developed since the Late Epipaleolithic (Natufian) and during the Early Neolithic period. In this lecture we will present evidence for architectural planning principles and methods (such as the use of geometry, the formulation of floor plans as an external planning device, and the standardization of measurement units) identified through formal analysis of architectural remains in key sites (such as Eynan, Göbekli Tepe and Çayönü) dated to these periods. Architectural formal analysis studies the forms of built spaces and is used to trace back aspects of architectural planning processes by discerning geometric regularities and identifying the spatial principles and compositional laws governing the generation of the structure's form. Together, these case studies form a quest into the origins and history of architecture from the perspective of architectural planning. Viewed as an example of Neolithic dynamics of cultural changes, these cases suggest that architectural transformations during these formative times (the transition to rectangular architecture included) were top-down process, based on theoretical knowledge, carried out by specialists and ultimately derived from a change in man-world (culture-nature) relationship and a new perception of the environment.

Building Göbekli Tepe: new insights and results

Moritz Kinzel

University of Copenhagen

Göbekli Tepe in Southeastern Turkey has challenged our view on the Neolithic period since Klaus Schmidt has re-discovered the site back in 1994. Since then the architecture was a focus of attention, but mainly because of the decorated T-shaped pillars and their interpretation as ‘temples’. The current building archaeological research in the framework of the DFG-funded long-term research project “The Prehistoric Societies of Upper Mesopotamia and their Subsistence” continues the work by D. Kurapkat and K. Piesker, but aims to re-assess the architecture in general to gain a better understanding of the built environment. The work of the last three years of research aims was to complete the existing documentation where possible, to do additional 3D-recordings, and to execute some targeted cleaning as well as small-scale excavations to clarify contexts. The contribution will present first results and will offer some new insights into the building stratigraphy and biography of Göbekli Tepe’s architecture, incl. building processes, repair and maintenance activities as well as its destruction.

The cultural distinction between plant domestication and crop evolution: comments on the archaeological process and resolution

Avi Gopher*, Shahal Abbo and Simcha Lev-Yadun

*Tel Aviv University

The pace of plant domestication is widely debated in plant domestication research in the Near East. The two debated views are: 1). A protracted (millennia long), process (part of the protracted-autonomous model), and 2). A short (within the resolution of Near Eastern Neolithic chronology, i.e., $\pm 50/100$ years) event (part of the core area-one event model).

We introduced a distinction between plant domestication and crop evolution under domestication (Abbo et al. 2014). This distinction is based on agronomic and genetic considerations, namely crucial (simply inherited) traits [without which cultivation cannot be profitable] vs. traits with similar variability in the wild genepools as well as among domesticated cultivars [that have by definition evolved under (post) domestication]. We consider this distinction fundamental in contributing parsimony to the core area-one event domestication model for several reasons. First, it enables a better distinction between genuine (crucial) Domestication Syndrome traits and those that evolved post domestication and hence are irrelevant to domestication episodes, and; Second, it secures a higher resolution in plant domestication research – i.e., a distinction between aspects of short, episodic domestication events and the long processes of crop evolution that continue to this very day.

Archaeological sites are the major reservoir of direct data/evidence on plant domestication and archaeology, has grown into a fine resolution discipline by high resolution field work and analyses (of sites and finds), and by using high precision radiometric absolute dating (e.g., C-14). This enables accurate dating of finds in sites relevant to plant domestication. Accurate, high resolution chronologies also enable reconstructing how archaeological finds (materials, ideas as well as domesticates) spread through the geography within the Levant and beyond, assisted by DNA polymorphism (variation) patterns among wild progenitors' populations and crop cultivars.

It is surprising and not easily understood why archaeologists (and to a certain extent archaeobotanists) studying plant domestication of the Near East turn their back to these achievements by lowering their resolution and blurring even quite evident and accepted cultural processes and distinctions. Consequently, past histories, that of plant domestication included, are viewed as fluid, pliable, easily led chrono-geographical patterns. This is a contra-productive path since it is not only scientifically unacceptable, but also surrenders the potential contribution of high resolution plant domestication research to both the conscience of modern world conservation efforts and to present day crop plants economy. This presentation will discuss and attempt explaining these trends in plant domestication research in the Near East.

Agriculture and life style: a paleodemography study of Pre-Pottery and Pottery Neolithic farming populations in the southern Levant

Vered Eshed* and Avi Gopher

*Israel Antiquities Authority

In the southern Levant, one of the earliest farming communities was established. This involved profound changes in mobility, social organization, economy, technology, and the demography of the populations.

This study presents the demographic characteristics of the early farming communities in the Levant (the Pre-Pottery Neolithic populations comparing with the Pottery Neolithic populations).

This study is the first to present a demographic profile of the Pottery Neolithic (PN) population. Mortality curves and various demographic parameters (e.g., life expectancy at birth, female and male Mean Ages at Death [MAAD], sex ratio and child/adult ratio) are reconstructed. These are compared to a large sample of the preceding Pre-Pottery Neolithic (PPNB and PPNC) populations from the Mediterranean zone of Israel and the Trans Jordanian Plateau.

The results indicate demographic differences regarding sex and age between the PN and PPNB and PPNC populations, with the PN showing a high percentage of deaths between the ages of 30–50; low percentages of survivors beyond the age of 50, and higher rates of females reaching old (post 40 years) age.

The demographic dynamic between the PPN and PN populations are the result of a long process of adjustment while the new agricultural/economic system was taking shape and fully established.

Social turmoil: 'Us and Others' in the Pre-Pottery Neolithic

Anna Belfer-Cohen and Nigel Goring-Morris

The Hebrew University of Jerusalem

Social 'connectivity' through time is currently considered as one of the major drivers of cultural transmission and cultural evolution. Within this framework, the interactions within and between groups are impacted by individuals' distinction of social relationships.

We will focus on changes in a major aspect of social perceptions, namely that of the 'other' and 'stranger' as reflected in the archaeological record, taking place during the final Pleistocene-early Holocene, with an emphasis on the Pre-Pottery Neolithic, in the Levant. These changes would have occurred due to the plasticity of cognitive mechanisms, in response to the growing demands on behaviour changes during the transformation then taking place along the trajectory of human social evolution, from mobile, extractive life-ways to sedentary, productive existence.

The concepts of 'other' and 'stranger' have previously received little attention in archaeological discourse, yet they are fundamental in the perception of social standing. The property of 'otherness' is defined by one's perception and is inherent to one's view of the world around oneself; when shared by a group it becomes a social cognitive construct. While perceiving of a person (or a group) as 'other' does not preclude social interactions, the cognitive boundary will remain. In contrast, allocating one the status of a 'stranger' is a socially-defined state that is potentially transient. We posit that 'others' and 'strangers' can be approached from contextual archaeological data pertaining to the Early Neolithic, with inferences regarding the evolution of the structure of human societies.

Under 'Palaeolithic' conditions (i.e., with sparse populations spread over extensive territories) there were only 'us' and 'others', since all people with whom one had any kind of interaction belonged (by default) to the same reproductive network and were known, even if they did not belong within the same basic social unit.

Through time, and most obviously on the eve of the Neolithic, there was an increase in global population and group size and a reduction in territory size – both linked to life-ways changes (e.g., economic modes, sedentism) and associated demographic changes. The larger groups (communities) could have served as a viable genetic pool nearly on its own, without the need to meet members of other groups on a regular basis. Encounters with individuals that did not belong to the same group were less crucial for survival, and thus neither preplanned nor repetitive. Concurrently, we witness a broadening of pan-regional 'connectivity', motivated by needs and/or demands for commodities, knowledge and expertise, which fostered contacts with far-flung groups. The members of those groups were not part of the mating system remembered from previous encounters or introduced by older members of the group. They were 'strangers'.

The cognitive, cultural and social processes involved in the maintenance and distinction between 'others' and 'strangers' can be defined as 'self-domestication', part of the overall internal and external domestication processes that took place on the eve and during the course of the Neolithic era.

Thursday 14

A lithic perspective on the Neolithisation of Egypt

Noriyuki Shirai
Waseda University

The beginning and development of food production in the Old World in the Early-Middle Holocene are now often called Neolithisation even without reference to lithic technological change. When the expansion of the Neolithisation phenomena within and beyond Southwest Asia is discussed, scholars working in Southwest Asia have not shown much interest in Egypt that is connected to Southwest Asia by the land bridge of Sinai. On the other hand, scholars working in Egypt have tended to stress that the life and culture of people in Egypt were fairly different from those in Southwest Asia, despite the arrival of Southwest Asian domesticates in Egypt. Late or no appearance of Southwest Asian domesticates in different parts of Egypt has sometimes been described as conservative local people's 'resistance' to foreign food resources, but how these domesticates were introduced to Egypt in the end has not been explained convincingly.

Previous studies on the diffusion of food production from Southwest Asia to Egypt have focused on the botanical and faunal remains of Southwest Asian domesticates as the sole evidence for the occurrence of food production, but neglected other material remains which indicate the beginning and development of food production. Given the poor preservation of botanical and faunal remains at many Early–Middle Holocene sites in Egypt, more attention must be paid to durable material evidence for the transmission of the technical know-how of food production from Southwest Asia to Egypt.

This paper will present a detailed picture of various stone tools of the Fayum Neolithic, which is known for Egypt's earliest domesticated cereal remains dated to the mid-5th millennium BC. It will discuss the local development and external influence seen in the lithic technology in the Fayum, and mention the possibility that the technical know-how of food production was brought to the Fayum much earlier than the mid-5th millennium BC and that people in the Fayum have exerted considerable effort to make food production feasible under difficult environmental conditions with the aid of stone tools over a millennium since the 6th millennium BC.

**Go west: new discoveries concerning the PPNB in the Eastern Desert of Egypt
between the Sinai and the Nile Valley**

Yann Tristant*, François Briois and Béatrix Midant-Reynes

*Macquarie University

Research conducted over the last ten years in the Wadi Araba (Eastern Desert of Egypt), as part of an archaeological survey project of the Institut français d'archéologie orientale (Cairo) in collaboration with Macquarie University (Sydney), has allowed the discovery of new Holocene sites. The presence of prehistoric stations containing flint tools including arrow heads and blades was reported in the 1950s, but this documentation has disappeared. The main site, located in Bir Buerat, has been revisited and other unpublished stations have been discovered in the vicinity of water wells that are dry today. The new surveys and sondages carried out in 2018 provide a rich and unique lithic documentation including several facies that we propose to present here. The main novelty is the discovery of two lithic facies with bipolar blade technology and projectile points of PPNB tradition. This documentation raises the question of the interactions between the Nile valley and the Levant during the Holocene era.

What are the differences between the Mesolithic and Neolithic sites in Armenia?

A comparison of the chipped stone tools from Lernagog and Masis Blur

Makoto Arimura*, Kristine Martirosyan-Olshansky, Artur Petrosyan and Boris Gasparyan

*Tokai University

In order to study the Neolithisation of the South Caucasus, it is essential to compare the Mesolithic sites with those of the Aratashen-Shulaveri-Shomutepe culture (South Caucasian Neolithic culture). In particular, chipped stones that are commonly found in any site can be used as important comparative material to investigate the relationship between the two groups of sites. The purpose of this study is to compare the lithic assemblages of Lernagog, a Mesolithic site in Armenia, with those of Masis Blur, an Aratashen-Shulaveri-Shomutepe culture site in Armenia, to understand the similarities and differences between the lithic industries in the two cultures, and to examine the relationship between the two cultures.

The materials analysed in this study are chipped stones obtained from the excavation of the Lernagog and the Masis Blur sites. Lernagog is an open-air site, located in the northwestern edge of the Ararat Basin, on the riverside terraces along the Mastara River, and is a site of the early seventh millennium BCE. Masis Blur is located in an alluvial area in the northern part of the Ararat Plain and dates from the sixth millennium BCE.

As a result of the analysis, the following points were clarified. First, as common features between the two lithic assemblages, it is confirmed that the main raw material was local obsidian, a blade-based industry, and the formal tools were mostly burins. On the other hand, the existence of stone tools characteristic of each lithic assemblage (microliths and Kml tools from Lernagog and transverse arrowheads from Masis Blur) and the difference in the blade production method can be pointed out as dissimilarities. In particular, the latter is a significant difference between the two sites. At Lernagog, small blades or bladelets were produced by direct percussion or pressure flaking, while at Masis Blur larger blades were produced by using different techniques (direct percussion, indirect percussion, and pressure flaking). The differences between the two sites seem to be more pronounced in terms of the manufacturing of whole lithic tools.

Neolithic chipped stone industry of Mentesh Tepe, (Middle Kura Valley, Azerbaijan): technological markers and relations to eastern Anatolia

Laurence Astruc*, Denis Guilbeau, Bernard Gratuze, Bertille Lyonnet and Farhad Guliyev

*CNRS

In recent years, several excavations of open-air settlements brought new light on the ancient Neolithic of the Southern Caucasus. Mentesh Tepe is one of them. The mound is the easternmost of a series of sites discovered in the Middle Kura valley, in the western part of Azerbaijan. The first occupation on virgin soil is Neolithic. The later sequence lacks of continuity and includes Chalcolithic and Early Bronze Age layers. The Neolithic period starts circa 5900/5800 and is over by ca. 5650/5600 cal BC. The architecture is characterized by above-ground or dug-in round buildings, sometimes associated and snow-men like, separated by open spaces. The latter comprise structures such as silos and working spaces. A large mass-grave gives information on the population of the village and the material culture on shared technical practices and activities. Architecture and pottery relate the site to the Shulaveri-Shomutepe culture (SSC) located in eastern Georgia, western Azerbaijan and central Armenia. In the same way, lithic technology shows that the inhabitants of the village shared traditions with other sites belonging to the same cultural entity but Mentesh also presents specific features.

Spatial analysis of Neolithic chipped and ground stone artifacts at Hacı Elamxanlı Tepe in the southern Caucasus

Seiji Kadowaki
Nagoya University

Recently increasing archaeological records in the southern Caucasus indicate a sudden appearance of agro-pastoral settlements in the region at the beginning of the 8th millennium cal BP, and Hacı Elamxanlı Tepe, west Azerbaijan, represents one of such early Neolithic settlements. Lithic artifacts from the site include sickle elements hafted with bitumen as well as large and numerous milling tools, indicating that cereal harvesting and processing were practiced frequently with well-developed tool-kits already at this early agro-pastoral settlement in the region.

This study aims to clarify how lithic production and use-behaviors were spatially organized in the settlement and analyzes spatial distributions of chipped and ground stone artifacts in the excavated areas. The excavation area is a 10 m x 10 m square located near the center of the site-mound. The excavation recovered four architectural levels over 1.5 m-thick deposits, and each of the levels includes one architectural unit, defined as the snowman-shaped building, and external space around the buildings. The external space is also divided by mud-brick walls.

This study examines various interior and exterior spaces defined by mud-brick walls as spatial units to analyze spatial distributions of lithic artifacts. According to the spatial units, I examine densities of several key categories of lithic artifacts, such as raw material types (e.g., obsidian vs. flint), tool types (e.g., milling tools), and debitage types (e.g., cores and core trimming elements). The results of the spatial analyses will be discussed from viewpoints of refuse management behaviors and the use of space for different activities. Such discussions can also provide implications for issues of seasonal transhumance and manufacturers of obsidian blades.

Pre-agricultural plant and animal management and the emergence of a low-level, food-producing society in the southern Caspian basin during the early Holocene

Hassan Fazeli Nashli* and Michael W. Gregg

*University of Tehran

This paper presents evidence for the pre-agricultural management of wild plant and animal resources in the southern Caspian basin. Findings from our 2017 excavations at Komishani Tappeh in northern Iran demonstrate that Epipalaeolithic foragers were targeting sheep, goats and water birds, collecting wild oats and wild barley, and using ground stone tools as early as 9200 cal. BC; while later 'Neolithic' inhabitants of the site continued to rely on the same suite of wild resources for at least 400 years beyond the first appearance and adoption of small flint blades and pressure-flaked, single-platform cores circa 8600 cal. BC. Two radiocarbon assays from aceramic Neolithic contexts at Komishani Tappeh fall between 8600 and 8200 cal BC, making it the oldest Neolithic site in the Caspian basin and one of the earliest Neolithic sites in Iran. Palynological evidence obtained from a lagoon nearby the site suggests that there was a relatively benign impact of the Younger Dryas in this region, with the persistence of diverse range of deciduous trees indicating climatic conditions favourable for human predation on a broad range of plant and animal food resources. Botanical and faunal evidence recovered from Komishani Tappeh also indicates the process of Neolithization in the southern Caspian basin was a gradual, low-cost adaptation to new ways of life, with no immediate abandonment of hunting and gathering, nor a climatic trigger event for the emergence of food-production.

A brand new thing: bladelet production techniques and methods in Caspian Mesolithic and Neolithic chipped stone industries

Mozhgan Jayez* and Hamed Vahdati Nasab

*Iranian Centre for Archaeological Research

Pressure technique in microblade production has long been recognized in Neolithic chipped stone assemblages of southeastern Caspian Sea, mostly from Kamarband Cave; but core preparation methods and reduction sequences has only been introduced as “bullet cores” or more precisely prismatic cores. By differentiating between “production techniques” and “production methods”, a distinction between microblade production methods becomes clear in chipped stone assemblages from Mesolithic to Neolithic and later periods, mostly from cave sites of Komishan, Kamarband, hotu and Ali Tappeh (Altappeh). Bifacial preparation of microblade cores is only apparent in assemblages later than Mesolithic in Caspian sites. Bifacially prepared, or narrow-faced cores, introduced in Far East assemblages as “Yubetsu” and “Horoko” techniques, has been widely recognized in lithic industries from southern Siberia, northern China, Japan, and the New World Arctic and as west as Tajikistan and Uzbekistan and is considered as a fossil index in tracing cultural relationships between these regions since 1930s. This research introduces the techniques observed in preparing variants of narrow-faced cores, mainly in Komishan cave assemblage in southeast of Caspian Sea, which is the type site of Caspian Mesolithic and Neolithic, and its explanation regarding the transfer of either technical knowledge or displacement of populations at the end of the Pleistocene and during the Early Holocene.

The development of early Neolithic chipped stone industries in the northern Zagros: the Palegawra and Karim Shahr assemblages

Douglas Baird
University of Liverpool

This paper considers changes from the Zarzian to the Early Neolithic in the northern Zagros by a comparison of chipped stone assemblages from renewed excavations of University of Liverpool at Palegawra and Karim Shahr.

The paper considers implication of major changes in raw material procurement, production technology, including the emergence of early forms of pressure debitage, nature and degree of the use of microliths and changes in other tool types. These are considered in relation to the nature of the sites concerned and consequent implications for our understanding of changes associated with the Epipalaeolithic- Neolithic transition in the northern Zagros.

Lithic pathways between the Zagros and S-Caucasus (and beyond)

Judith Thomalsky

Deutsches Archäologisches Institut, Teheran

The evolution of lithic industry of the early prehistoric period of the Iranian highland can be described as a local tradition that derives from a “Zagros Neolithic”. Indeed, its primary character –the bullet core/bladelet industry– significantly differs from the PPN naviforme core/large blade industry of the western Fertile Crescent. Any other tradition that may have influenced the Neolithic industries of Iran cannot be drawn clearly yet though we should consider some (more or less determined distinctive) traditions further east. As for the advanced Neolithic and Chalcolithic, one can demonstrate a somewhat “congruent” technological evolution towards larger blades throughout the Iranian plateau. On the other hand, several distinctive local and/or short-term phenomena in terms of lithic technology, typology and innovation, indicate a rather complex pattern of lithic evolution that requires further going discussion.

This contribution will firstly give a general overview about the Neolithic and early chalcolithic industries of Iran inclusive possible successors and derivatives, influencers, and by-products of prehistoric networks. Secondly, a special focus is laid on the characterization of lithic industries of NW-Iran that can be regarded as an agile, intermediate transitional zone between the plains of Northern Mesopotamian and the Iranian plateau, and the highlands of the Zagros range and the Caucasus. For the latter, recent investigations gathered new data that will further affect our picture of the lithic industries of Iran as well.

Re-investigating Neolithic transition in the central Zagros as seen from recent excavations at Asiab and Ganj Dareh

Hojjat Darabi* and Tobias Richter

*Razi University

The Neolithic transition is usually characterized by gradual cultural co-evolution from the late Epipaleolithic into the early Neolithic when subsistence strategies, nature of settlement and social and ritual structures were changing. Across the Near East, these transitional developments have chronologically been placed within the so-called PPNA. Nevertheless, judging from various lines of evidence, cultural diversity is attested at this vast regional scale from western through eastern territories, i.e. from Levantine corridor to the Zagros mountains, though some common elements are also visible. In this respect, the Zagros region is entirely assumed to be an "eco-cultural zone" that witnessed rather different trajectories. Previous investigations in the 1960–70s have shown a gap of occupation between late Epipaleolithic and early Neolithic time in the central Zagros though it has been somehow bridged by later work at the sites of Chogha Golan and Sheikh-e Abad. Furthermore, some of the previously excavated sites had not been published in great detail leaving various questions unanswered. In this regard, a new Iranian-Danish project was initiated to obtain a better understanding of the role played by the central Zagros in the Neolithisation process during the late Pleistocene and early Holocene. To date, the sites of Asiab and Ganj Dareh have been re-excavated by the project. Additionally, a reconnaissance survey was carried out in the Kermanshah region in 2018 to identify new Epipaleolithic and Neolithic sites. Although some analyses are still underway we have revisited these two sites in terms of stratigraphy, chronology, subsistence strategy and nature of occupation. Based on our new evidence, Asiab (c. 9600–9300 cal. BC) was established when the cold, dry Younger Dryas came to an end and climate and environment had improved. However, the site seems to have been occupied by hunter-gatherer communities as a non-residential settlement or ritual center in the Transitional Neolithic. This is shown by the discovery of a large communal structure at the site. Ganj Dareh (c. 8200–7600 cal. BC) suggests a sedentary life style that is shown by solid structures, storage facilities and food production. The site's occupants took an early step toward herding and domesticating goats in southwest Asia. Evidence gained from recent excavations at these two sites shed new lights on the transition to the Neolithic period.

The chipped stone industries from the new excavations at Asiab and Ganj Dareh: dating, comparisons and insights

Tobias Richter* and Hojjat Darabi

*University of Copenhagen

Asiab and Ganj Dareh were some of the first Neolithic sites to be explored in the central Zagros and hold a special place in our understanding of the emergence of early Neolithic societies in this region. Both sites produced substantial chipped stone industries that are currently curated at various institutions around the world, chiefly the National Museum of Iran. The Ganj Dareh assemblage, in particular, has been studied in greater detail. However, we lack a detailed understanding of both sites due to the lack of final publications of the early excavations. New excavations at both Asiab (2016) and Ganj Dareh (2017 & 2018) have produced substantial collections of chipped stone artefacts, which can now be contextualized in the framework of our recent excavations. They provide us with an overview of the evolution of chipped stone traditions and economy during the earliest phases of the Neolithic in the central Zagros. In this paper we present our initial analysis of the chipped stone material from both sites, discuss their technology and typology, and compare them with other site inventories near and far.

Towards the understanding of the Early Neolithic in the Zagros Mountains: results of new investigations in the Ilam province, Iran

Bogdana Milić*, Barbara Horejs and Lily Niakan

*OREA, Austrian Academy of Sciences

This paper aims to offer an overview of the new Early Neolithic occupations documented in the scope of recent interdisciplinary investigations of the Austro-Iranian team in the Central Zagros (Iran), by focusing on chipped stone production. A systematic survey of the previously unexplored micro-region in the Zagros highlands in the Ilam province attested to certain settling patterns in the Sirvan and neighbouring Chardavol Valley. Material studies and topographic settings of investigated locations provided an insight into the existence of the Pre-Pottery Neolithic horizon in this area, whereas the technological and typological analysis of chipped stone collections contributed to a further attribution of the material to earlier and later phases of the Neolithic.

Based on the locations where prehistoric activities have been recorded in the Sirvan Valley, the hill-flanks alongside the river basin appear to be the best candidates for settling during the Neolithic according to numerous find scatters on terraces and natural plateaus around the height of c. 900 m. On the contrary, the flood lands of the Sirvan River were not used in the earlier prehistory for longer periods, except in the case of already existing natural mounds as geological elevations in the valley. On the other hand, the pilot survey in the adjacent Chardavol Valley focused on the investigation of the tell site of Chogha Khaki, the so far only long-term occupied Neolithic site in the broader survey area, and its direct vicinity, which indicated a different pattern of the landscape use.

The focus of this paper is the presentation of the chipped stone assemblages recovered from the site of Chogha Khaki and other rather smaller scatters from the Sirvan Valley. However, the results will be discussed in a broader context, by looking at the early appearances of pressure technique and the distribution of typologically characteristic tools such as projectile points and backed bladelets, in order to address this part of the Central Zagros highlands in a more general picture related to patterns of the Neolithisation processes in the Near East.

Lithic use-wear analysis from the Early Neolithic site of Chogha Golan in western Iran

Mohsen Zeidi*, Jimmy Linton and Nicholas J. Conard

*University of Tübingen

Prehistoric stone tools are one of the most important resources for the study of early technology among human populations. Functional interpretations by using microscopic use-wear analysis during the last decades have been used as an important method to detect evidence of prehistoric human technology. Despite technological and functional perspectives on use-wear studies, archaeologists use these data to reconstruct prehistoric economic systems and interpret prehistoric living activities.

Chogha Golan is situated in a semiarid region, in the foothills of the Zagros Mountains. The site is exclusively an Aceramic Neolithic tell site occupied between 11,700–9600 cal. BP and consists of 11 Archaeological Horizons (AH), each containing abundant chipped lithics, organic and inorganic remains, represent a key site for investigating the early Neolithic of the region and provides an extraordinary case study to examine human behavioral adaptations linked to an emerging agricultural economy and village life in the foothills of the Zagros Mountains. Ongoing lithic analyses provide insight into raw material procurement and continuity of cultural traditions between the Epipaleolithic and early Neolithic of the Zagros region. The main characteristics of the lithic assemblages at the site are rather constant throughout the sequence. The locally available chert always dominates and lithic knappers at Chogha Golan produced mainly bladelet by pressure flaking technique using unidirectional cores for making different standardized tool types.

This paper aims to present the results of the use-wear analysis of chipped lithics from the early Neolithic site of Chogha Golan. A random selection of microscopic traces of wear from 60 stone tool implements from all Archaeological Horizons is studied, in order to reach conclusions about how stone tools were used. The article describes the used material and applied motions with each tool type. Finally, a conclusion which contributes to the Neolithic activities and settlements' economy at the site.

Returning to hunting and re-microlithization during the Mushki phase in Fars, the southern Zagros

Masashi Abe*, Saiji Arai and Morteza Khanipour

*The Tokyo National Research Institute for Cultural Properties

Hormangan is a Pottery Neolithic site, which is located in the Bavanat River basin in the north-eastern Fars, southern Zagros. This site was excavated by one of the authors in 2016. The site is less than 0.5 ha in size and its artificial deposits are very shallow, less than 1m in thickness. The excavation revealed two phases: the early phase and late phase. In the late phase, rectangular buildings built of *chineh* were constructed, while no remains of buildings were discovered from the early phase. Only ash lenses and hearths were excavated from the early phase, suggesting the site was used as a camp site during the early phase.

There are no clear differences in the material culture between the two phases. Both phases yielded Mushki type pottery shards. The radiocarbon dating revealed that the early phase dates to the period between ca. 6400 BCE and ca. 6200 BCE and the late phase dates to the period between ca. 6200 BCE and ca. 6000 BCE.

As the sample excavated from the early phase is small in number, this paper analyzes only animal bones and lithic assemblages excavated from the late phase of Hormangan. The analyses shows that the hunting of wild animals such as gazelles and onagers became important again and re-microlithization (radical increase of bladelets, backed bladelets, lunates and trapezes) occurred in the late phase (the late Mushki phase) (6200 BCE–6000 BCE) although recent studies reveal that herding of domestic animals and cereal cultivation had already been introduced and became the major activities for subsistence in the Aceramic Neolithic in Fars. It can be concluded that these changes occurred during the late Mushki phase were probably caused by the 8.2 ka event.

**A PPNA settlement in the upper Tigris basin (southeastern Anatolia):
Gusir Höyük**

Çiler Altınbilek-Algöl*, Semra Balcı, Damase Mouralis and Necmi Karul

*Istanbul University

Gusir Höyük is one of the PPNA settlements located in the 40 km south of Siirt, 2 km west of Ormanardı Village in Eruh County (Southeastern Turkey). The results of the excavation have shown that the settlement dates to the Pre-Pottery Neolithic Period, mainly to the PPNA horizon. The radiocarbon dates supported this observation and dated the site between 9977±48 BP (KIA44178 GSR 4) and 9590±45 BP (KIA44180 GSR 6).

The raw material the assemblage is composed of flint (91%) and obsidian (9%). According to numerous amounts of flake and blade cores, flint assemblage was evidently worked at the site while obsidian was brought to the settlement as an import material after being knapped elsewhere and were probably worked locally into different tools as the existence of very small-size debris suggests.

The tool types consist of points, perforators, scrapers, retouched blades and flakes. Point types are of importance as a chronological indicator and there is a good variety of the Nemrik points in the settlements.

Change and continuity in the lithic industry of Hasankeyf Höyük: a PPNA hunter-gatherer site on the upper Tigris

Osamu Maeda
University of Tsukuba

Recent archaeological investigations of the PPNA period in the upper Tigris valley in southeast Anatolia have shed new light on the local PPNA culture in this region, which had previously only insufficiently been known. While some archaeological evidence, such as the establishment of sedentary villages, the construction of round subterranean buildings and symbolic depiction of geometric and animal motifs, demonstrate a certain link between the upper Tigris and the Jazirah/Levant to the west, the regional differences between these two areas in, for instance, subsistence economy and burial customs, have become clear. Equally, the lithic industries in the upper Tigris valley show a distinct local character and, in particular, the new evidence from Hasankeyf Höyük excavated since 2011 provides us with a detail information in order to consider change and continuity in the flint and obsidian artefacts through a good sequence of for about 500 years. Although I have already presented elsewhere the general characteristics and the chronological trend in the use of chipped stone artefacts at this site (Maeda 2018), the additional evidence made available in the last couple of years, as well as the new results of radiocarbon dates, confirms and expands our understanding of the lithic industry on the upper Tigris in the later half of the 10th millennium cal BC. The results of the study demonstrate several points as summarised below.

- 1) The chronological sequence of the lithic industry of Hasankeyf Höyük from the bottom of the cultural deposit to the uppermost level of the mound shows continuous tradition observed in the use of raw materials, the blade production by percussion and the use of microliths and other characteristic formal tools.
- 2) Some change is also observed in the uppermost phase of the sequence, at around 9200 cal. BC, as represented by the appearance of Nemrik points, the increase of end-scrapers and the use of heat treatment of flint.
- 3) However, Nemrik points at Hasankeyf Höyük indicate their local development within a hunter-gatherer lithic tradition rather than an introduction of new 'Neolithic' culture from elsewhere.
- 4) Such continuity and change are characteristic of the PPNA lithic industry in the upper Tigris valley, which shows many differences from that in the north Levant and north Mesopotamia.

Reference

Maeda, O. 2018 Lithic analysis and the transition to the Neolithic in the upper Tigris valley: recent excavations at Hasankeyf Höyük. *Antiquity* 92 (361): 56-73.

The chipped stones of Göbekli Tepe: new insights into the PPNA and PPNB

Jonas Schlindwein
University of Cologne

Göbekli Tepe with its monumental architecture and rich decorations is an outstanding archaeological site. In the last three years research on chipped stones continued in the framework of the DFG funded long-term research project “The Prehistoric Societies of Upper Mesopotamia and their Subsistence”. This contribution aims to present first results of three chipped stone assemblages of Göbekli Tepe which have been analysed in the course of an ongoing Ph.D., based on technological, typological and statistical studies. The construction of two shelters, one covering the main excavation area and the other covering an area in the Northwest of the site, offer new insights into the chipped stone industries of Göbekli Tepe. In both cases complete stratigraphic sequences from top soil to bedrock were uncovered. Under the NW shelter a PPNA assemblage from a sealed deposit located under a structure between bedrock and limestone floor was identified representing one of the earliest activities in this area. In the main excavation area construction works entailed the excavation of the remaining sediments in PPNB rectilinear room 16 north of building D. Both assemblages offer unique diachronic insights into the chipped stone industries of Göbekli Tepe because all loci were dry sieved and floated to ensure the maximum retrieval of artefacts. Overall results of the so called “sediment block” analysis located within building D will also be discussed. The “sediment block” was recorded in fine-scale to serve as a reference for the up to 4.5 m thick deposit fill in building D. All sediment was dry sieved and floated offering a unique opportunity to study the chipped stone assemblage. However, due to the high amount of recovered chipped stones (approximately 115,000 pieces) only a selection of chronologically relevant projectile points and microliths have been analysed in detail. Furthermore, a comparison of all three assemblages will shed new light on (post-) depositional processes at the site.

Friday 15

The symbolic meaning of the Neolithic manuports: the examples from Nemrik 9, northern Iraq, and Ayakagytma 'The Site', Uzbekistan

Karol Szymczak
University of Warsaw

The article presents a special kind of the archaeological finds called the manuports, coming from two exemplary early Neolithic sites from the Near East "Nemrik 9", and Central Asia "Ayakagytma 'The Site'". Manuports are the natural, usually stone objects of extraordinary shapes. Some of them have anthropomorphous forms. During the prehistoric times they were collected and brought to the dwelling places, without any serious modifications. Most of them were most probably treated as the symbols, but today we can only speculate as to their actual meaning. Perhaps, they had different significance than the material symbolic items produced on purpose, as in the prehistoric times they were found only accidentally, and their interpretation was secondary to the fact of picking them up. It is possible to identify a few categories in this group of finds: schematic anthropomorphous figurines, elements of faces, self-bored/adder stones, other naturally perforated pieces, stones of odd shapes. Collecting the manuports is as old as the humankind, and, in some forms, lasts to the present day.

The stone rings from Motza

Ianir Milevski, Hamoudi Khalaily and Jacob Vardi

Israel Antiquities Authority

The current salvage excavations at the site of Motza, near Jerusalem, have exposed a huge site dated to the Middle/Late and Terminal PPNB (PPNC). Furthermore, a Late Pottery Neolithic (late Wadi Rabah or Early Chalcolithic) extended occupation existed at the site. Among the numerous finds stone rings –also labelled bracelets– were found. These artifacts are made mostly of limestone and are of two main types: 1) most of them are plain rings, some of them with perforations in their extremes and rounded sections, and 2) few are grooved rings with flat rectangles curved corners in section.

Stone rings have been reported from Pre-Pottery Neolithic assemblages in Jordan, mainly from 'Ain Ghazal and Baj'a, but also in the Mediterranean coastal plain at Ashkelon. These rings represent a specialized production involving limestone and sandstone among the main lithic materials. although some of them were also made of ivory as in the case of Ein Zippori (Lower Galilee). Grooved rings, were found in Anatolian sites dated to the Late Neolithic.

At Motza around 200 rings were found –until today– in three of a total of eight areas of excavation. In this lecture we will address not only the typological questions but also the suggested *chaîne opératoires* for the manufacture of these rings in the light of other components of the groundstone assemblage at the site.

Initial use-wear analysis of ground stone from two Natufian-PPN sites in the Qa' Shubayqa of eastern Jordan: ground stone and changing foodways

Patrick Nørskov Pedersen

University of Copenhagen

The research presented here is part of the research project “*Changing Foodways*” at the Centre for the Study of Early Agricultural Societies (CSEAS), University of Copenhagen – A project that examines how humans changed their ways of procuring, processing, cooking and eating food as they went from being mobile hunter-gatherers to sedentary agriculturalists.

In this talk I will present some preliminary results from my part of the project, which concern the role of ground stone tools, in particular grinding tools, in processing foodstuff before consumption. Specifically, I examine the grinding tools from two sites, one site belonging to the Natufian period and one from the late/final Natufian-PPNA, both located in the Qa' Shubayqa of Eastern Jordan. The Natufian period is often thought to represent the last hunter-gatherer societies in southwest Asia and thus this data provides us with an unique insight into how food processing strategies changed at this crucial time in the past, at the dawn of agriculture.

This presentation introduces some of the research I have completed so far as part of my PhD project. Here I address the question of *change* by examining changes observed in grinding tools and technology at both the macroscopic and microscopic level. I examine how movements involved in operating tools, so-called *gestures*, change and how this is expressed macroscopically in morphological changes of the used surfaces of tools. This is then paired with microscopic use-wear analysis of these same surfaces. I provide some suggestions as to what these tools were used for, and more general insights into the role of these tools in food production, processing and preparation, during the transition from the Natufian to the PPNA in southwest Asia. I argue that the general morphological changes we observe, may be a result of initial shaping but most importantly were the result of changing gestures. There appears to be a shift from grinding with circular movements, resulting in circular or oval basin surfaces on tools from the Natufian to reciprocal movements resulting in sloped elliptically shaped surfaces on tools from the PPNA and changes in the size of these face and of upper tools at the Shubayqa sites. I discuss whether this is reflected in the microscopic use-wear observed on the tools, and consequently if this may be the result of a change of the matter processed or in desired end-products or whether microscopic use-wear is independent of these morphological changes. This tells us something about how food technologies, or *foodways*, involve bodies, tools and activities and how production, from initial procurement to subsequent processing, and to the final act of consumption was organized at this time.

**Flaking or grinding as preform ground stone reduction techniques:
habits of stone tool production in prehistoric Cyprus**

Andrew McCarthy
University of Edinburgh

The site of Prasteio-*Mesorotsos* in the southwest of Cyprus has evidence for continuous inhabitation from the pre-pottery Neolithic into historical periods. The longevity of occupation provides an opportunity to interrogate changing techniques of stone tool production at a single site and identify chronological differences in technology and crafting habits. The ground stone tool assemblage from Mesorotsos, including partially worked and re-worked tools, shows that ground stone tool crafting typically included a series of stages of grinding as a way to preform tools for final production. Contrasting this, the newly excavated site of Makounta-*Voules-Mersinoudhia* (Chalcolithic and Early/Middle Bronze Age), in the northwest of Cyprus, shows a different ground stone tool craft tradition, challenging the idea that the evidence from Mesorotsos is purely chronological, rather there may be regional or site-specific trends. Unlike at Mesorotsos, Voules-Mersinoudhia shows a high rate of flaking as a technique of ground stone tool preform reduction or reworking. In other words, the people at Mesorotsos were grinders and the people at Voules-Mersinoudhia were flakers. These inter-site differences in craft techniques will be considered in the context of chronology and regionality on the island.

Blade technology at Ais Yorkis, social and cultural associations

Carole McCartney

University of Cyprus

The PPNB site of Ayis Georkis in western Cyprus is unique in terms of its location and circular 'platform' constructions, yet shares elements of material culture, namely, a diversity of incised green stone (picrolite) objects and ornaments, imported obsidian and the presence of cattle in the faunal assemblage, being at least superficially aligned with the sites of Shillourokambos and Akanthou. Though the cultivation of domesticated cereals and legumes was clearly important, the large faunal assemblage shows a preference for hunted deer, which together with a ground stone assemblage dominated by large serving vessels and platter fragments have been interpreted in terms of feasting. Generally, the PPN sites of Cyprus show a significant degree of variability. Accordingly, whether the site of Ayis Georkis represents a singular community, or was a place for a number of communities to gather, make exchanges of food, exotics and information (as occurred the wider Levant) is addressed through the analysis of blade-making practices. A detailed analysis of the blade characteristics and production *chaînes opératoires* used at Ayis Georkis is documented in order to assess the degree of shared know-how with other PPNB sites on the island. Consideration of blade types belonging to all stages of preparation, blade production, maintenance and error correction is weighed against evidence gained by refitting. This data is used to evaluate similarities, indicating social cohesion between Cypriot sites, or differences, implying more varied mainland origins and/or more isolated communities on Cyprus, defining the Neolithisation process in terms of dynamic human migrations and social practice.

Big data! Obsidian in the Levant

Elizabeth Healey*, Stuart Campbell and Osamu Maeda

University of Manchester

Data on the use and provenance of obsidian found in the (wider) Levant has been transformed in the past few years as non-destructive and portable analytical instruments become more readily available. It is now possible to provenance entire or almost entire assemblages, so that the variety and size of data sets has increased immensely. While the interpretation of closed data sets from individual sites will remain important, it is increasingly practical to look at large scale patterns of changes. To work with these sets of 'big data' we need to use a wider range of analytical tools as well as exploring new interpretations of the diffusion of obsidian. Simpler models are being replaced by other approaches such as least cost path and connectivity analysis, richness and diversity indexes and various forms of network analysis.

In our paper we add to this debate, building on large data sets from our analysis of three sites of Neolithic date in different parts of the Levant and comparing them with data from other sites. It demonstrates that the picture is more complex than we originally envisaged and that source complexes are used in more subtle ways.

Several factors probably contribute to this. Change over time is, undoubtedly, one factor although this can manifest itself on both small and large timescales. There are also regional variations but they need to be considered within the wider networks through which obsidian was distributed. The ways in which obsidian was obtained from the sources to supply the networks of distribution in some cases will also be an important consideration. Furthermore, obsidian distribution and use did not take place in isolation from other materials, but formed part of wider cultural change and contact.

Hasankeyf Höyük: preliminary results of the geochemical sourcing of obsidian from a southeastern Anatolian PPNA site

Rose Moir*, Tristan Carter and Osamu Maeda

*McMaster University

In this study we analyzed 270 obsidian artifacts from Hasankeyf Höyük, a Pre-Pottery Neolithic A [PPNA] site of the 10th millennium cal BC, located on the Upper Tigris River in Southeastern Anatolia. This assemblage came from the infill deposits of three circular stone-based structures (specifically 1, 3, and 8), and is techno-typologically similar to contemporaneous sites in the region, such as Körtik Tepe and Gusir Höyük. Our aim was to determine the specific volcanic sources that were being utilized by this community; by doing this, we intended to define their context within the supra-regional circulation of obsidian in the Near East. The artifacts were analyzed whole and non-destructively using Energy Dispersive X-Ray Fluorescence [EDXRF] spectrometry at the McMaster XRF Lab. Our results showed that a majority (94%) of the obsidian that was analyzed was procured from Nemrut Dağ, which produces a distinctive dark translucent green peralkaline obsidian. The remaining 6% of the characterized assemblage consisted of artifacts knapped from Bingöl A, Bingöl B, and Muş obsidian, as well as a single piece with elevated rubidium (Rb) values associated with the ‘Group 3d’ source of unknown location. The results suggest that while broad comparisons can quickly be made between the chipped stone traditions of Hasankeyf Höyük and other Upper Tigris sites, significant distinctions can also be distinguished. Therefore, although it is apparent that these communities were procuring their obsidian from the Lake Van region sources, we note that the amounts of particular sources used to make stone tools are quite different. Particularly Körtik Tepe, where only 13% of the characterized assemblage was made of Nemrut Dağ. Our preliminary conclusion is that while common knapping traditions between these communities is likely a reflection of the establishment of social relations (via intermarriage, for example), the differences in particular raw materials suggests independent practices with regard to obsidian procurement, i.e., likely a direct access model. The next step will be to integrate the raw material data with the techno-typological information in order to detail source specific consumption practices, together with GIS modeling of potential routes taken to the sources. The final data will be incorporated into a wider consideration of obsidian use and practices in the Pre-Pottery Neolithic A.

Late Neolithic Çatalhöyük: lithic procurement, production and use in a pan-regional perspective

Heeli C. Schechter

The Hebrew University of Jerusalem

Obsidian is the material of choice for making chipped stone tools at Çatalhöyük. The site is located approximately 200 km from the Cappadocian sources, close enough for consistent regular supply of raw material. In the Late Neolithic levels of the site, most of the obsidian, about 75%, originates from Nenezi Dağ while the rest comes from Göllü Dağ – two Cappadocian sources separated by merely 7 km. Occasional rare artefacts originating in Eastern Anatolian sources were also found, illuminating long-distance relationships with eastern regions. The dominant production technology at the Late Neolithic levels at Çatalhöyük, accounting for over half of the obsidian assemblage, is pressure-flaking, designed to produce blades and bladelets. Cores were brought to the site ready-made, while production by pressure and maintenance by percussion were performed on-site. The produced laminar items were used as-is or shaped into tools by retouching. Retouching was also performed on-site, in habitation areas, by pressure or percussion. The tool variety is very consistent and repetitive, including mostly different ad-hoc appropriations of the blades and bladelets, along with wedges, scrapers, perforators and points. These characteristics, including the source ratios, the production technology and tool type variety are very different from what was observed in earlier levels at the site and represent a major shift in chipped stone related practices. A south-eastward-facing network of regional relationships is reflected in the appearance and use of the pressure technology, obsidian from eastern sources, specific tool types, and more.

Tepecik Çiftlik (Turkey) and the exploitation of Cappadocian obsidian during the 7th millennium: preliminary results

Denis Guilbeau

Ministère de la Culture, France

During the 7th millennium, most of the published information we have about the exploitation of Cappadocian obsidian comes from Çatalhöyük, which is about 150 km away from the outcrops, and come from sites situated in the Fertile Crescent, even at a higher distance. Therefore, the mound of Tepecik Çiftlik, situated in the Melendiz plain, a few kilometres away from the Göllüdağ and Nenezidağ obsidian sources is a key-site to understand the evolution of the lithic traditions and the organization of the obsidian distribution. In this site, besides a handful flint artefacts, the lithic industry is entirely made of obsidian and is extremely abundant. For instance, the short and limited 2018' excavation yielded more than 100 kg of chipped stones.

The study of this industry is ongoing, but already several features emerge. This raw material was used for several productions in different *chaînes opératoires*, including very highly skilled ones. The bulk of the industry consisted of flakes and debris, but finished products retouched and used as tools are not rare. The production of flakes is dominant. Some were linked to blade knapping *chaînes opératoires*, but the majority corresponds to the primary production of flakes. The debitage of bipolar blades is well attested. The presence of numerous upsilons –including a few ones up to 140 mm long– indicate that it corresponds at least partly to a predetermined-epsilon knapping. The blades are comparatively rare, but some are no longer recognizable because they were transformed in pointed arrowheads (or spearheads) by an invasive, sometime covering, pressure retouch. Other blade knappings are documented, like unipolar irregular blades. Pressure blades are extremely rare.

The organization of these different *chaînes opératoires* is to be specified in the following years. We can already underline that those devoted to the productions of blades are not complete, for instance blade cores are extremely rare. Among the toolkit, pointed arrowheads and spearheads dominate. They are either shaped from bipolar blades or flakes. Scrapers are numerous, including very regular round ones. There are also marginal productions of very specific products, like mirrors.

The extreme abundance of obsidian and the frequency of waste and flakes related to the shaping of cores in comparison with tools indicate that the knappers produced blanks not only to supply the needs of the settlement itself, but also for other settlements. Tepecik had probably an important role in the exploitation and the distribution of this raw material during this period.

**The exceptional chipped stones and pottery assemblage from the "BY space"
at Tepecik Çiftlik (Cappadocia, Turkey, ca 6000 cal BC):
a techno-functional study**

*Alice Vinet, Denis Guilbeau and Martin Godon

*University Paris 1 Panthéon Sorbonne

Tepecik Çiftlik is a site located in a small and circumscribed plain in Cappadocia (Turkey), a few kilometers away from the obsidian sources of Göllü Dağ and Nenezidağ. The mound was inhabited from the Late PPNB to the Early Chalcolithic, from the beginning of the 7th millennium to the beginning of the 6th millennium. The site comprises several levels of occupation with associated houses and open areas.

This communication focuses on an exceptional space uncovered in 2015. The BY space is part of a larger house occupied during the transition between the Late Neolithic and the Early Chalcolithic and is dated to ca. 6100–5900 cal. BC. Many exceptional artefacts were found *in situ* on the floor, mainly highly decorated pottery and large chipped stones. The BY space was interpreted as a storage area as empty silos were found inside the room. However, our analysis shows that it was a sealed deposit. The objects were placed on the floor and the access to the room condemned. Indeed, the pots are complete, the bases are broken because the roof collapsed. If the manufacture and the style are similar to the contemporaneous productions found on site, these pots stand out by their exceptional plastic decorations. Underneath the pots, 25 lithic pieces were found. All but one are on obsidian: seven nodules of good quality, one *débris*, four unretouched large blades, one unretouched flake, nine retouched large blades, two arrowheads and one foliate. These artefacts correspond to different *chaînes opératoires*. For instance, several flakes correspond to a high-skilled production of very large blanks. The nodules are almost not flaked at all, besides a few removals to test their quality. The use-wear analysis was conducted on 17 pieces. All of them were used for a wide variety of activities: cutting and scraping hide (fresh and dry, sometimes with additives), scraping and sawing bone (fresh and dry), sawing whittling and debarking wood, harvesting plants like reeds. The data suggests that this cluster could correspond to a toolkit used in daily activities, making us rethink the function of the BY space.

Integrating the processes of sedentism atop the Central Anatolian Plateau in light of the Cappadocia Prehistoric Survey (CAPs)

*Nurcan Kayacan, Güneş Duru, Mihriban Özbaşaran and Nigel Goring-Morris

*Istanbul University

Initiated in 2015 the Cappadocia Prehistoric Survey (CAPs) was conducted for three seasons (2016–2018) with a view to exploring evidence for the initial long-term settlement of the region atop the central Anatolian plateau at the end of and following the Last Glacial Maximum. The survey focused on the entire Melendiz Çay catchment area, centering in particular around the early Holocene ‘megasite’ of Aşıklı Höyük (Özbaşaran 2012; Özbaşaran et al. 2018).

Encompassing a total area of ca. 25 x 25 km, the systematic, stratified survey was designed to examine the varied volcanic landscapes comprising the region. These included riverine settings, wetlands, alluvial valleys, lava flows, rolling plains, cliffs and prominent hills, as well as the foothills of the major hills/mountains in the east and south of the area. Previously documented sites were also revisited, such as Çakılbaşı (Gülçur 1995), Acıyer (Balkan-Atlı 1998) and Musular (Özbaşaran et al. 2012).

The survey documented only sparse evidence for earlier periods - occasional Middle Palaeolithic Levallois material in reworked contexts, as well as a possible (late?) Upper Palaeolithic occupation from a volcanic cave. Evidence for microlithic Epipalaeolithic/Early Neolithic occupations included the in situ wetland settlement of Balıklı (to be described separately), as well as small possible observation points in prominent locations overlooking the rolling plains; preliminary observations indicate that these may correspond to the lower levels of Aşıklı.

Introducing Balıklı: an early Holocene settlement in Cappadocia

Nigel Goring-Morris*, Güneş Duru, Mihriban Özbaşaran,
Müge Ergun, Natalie Munro, Mary Stiner and Nurcan Kayacan

*the Hebrew University of Jerusalem

The early Holocene site of Balıklı was discovered during a brief reconnaissance visit ahead of the Cappadocia Prehistoric Survey (CAPs) in the summer of 2015. Extending over ca. 0.5 ha the settlement is located on a slight rise within a formerly extensive wetland area of marshes and springs by the headwaters of the Karasu Çay at the northern end of the Gülağaç basin, a major northern tributary of the Melendiz Çay. Balıklı is located 13 km northeast of the major settlement of Aşıklı Höyük, and 7 km west of Nenezi Dağ.

On visiting the site in 2016 it transpired that illicit mechanically excavated pits had damaged the site. However, the sections provided revealed that the *in situ* deposits reached depths of 80–180cm, and that extensive architectural remains of *kerpic*, wattle and daub and other constructed features and pits were present, together with abundant and varied small finds.

Two weeks of systematic excavations were conducted at Balıklı during in 2018, when two areas were investigated adjacent to two of the pits. Preliminary results indicate that the site probably represents an intense but relatively brief settlement. One semi-subterranean oval structure had been repeatedly rebuilt through the entire occupation sequence, apparently having been constructed above a series of (foundation?) pits containing burials, grave-goods and a cache in an adjacent pit. Throughout the occupation levels rich and varied chipped stone, groundstone, bone tool, faunal and botanical assemblages, as well as symbolically-charged items, were recovered.

We will provide an overview of the initial results obtained at Balıklı and place them within the context of broader early Holocene developments atop the central Anatolian plateau, and will especially focus on comparing the abundant lithic assemblage from Balıklı with respect to those from the initial, lower levels at Aşıklı Höyük and sites elsewhere in Turkey.

Lecture at the INTERMEDIATHEQUE

Friday 15, 17:30-18:30

A Levantine view of the Jomon culture of the Japanese Archipelago

Yoshihiro Nishiaki
The University of Tokyo

The Jomon culture represents a group of archaeological entities of foraging societies in prehistoric Japan, dated from a period between the 16th millennium BC and the 3rd century AD at maximum, differing by region in this 3000-km-long archipelago. Primarily based on a hunting and gathering economy, with some horticulture of millet, beans, and other plants, the communities of this culture established sedentary settlements in the terminal Pleistocene, quite early in world prehistory. They also developed complex social structures that in other parts of Eurasia are often interpreted as hallmarks of the Neolithic culture. In addition, production of elaborate pottery and polished stone tools, also considered to characterize Neolithic society, was part of the daily activities of this culture.

To highlight the distinct features of the Jomon as a culture of prehistoric foragers in Eurasia, this presentation provides a comparison of its archaeological records with those of the Natufian and the early Neolithic cultures of the Levant. Since they are situated in the temperate zone at almost the same northern latitude (35.7° in Tokyo and 35.5° in Latakia) but at opposite ends of the Asian continent, their comparison would contribute to understanding how the terminal Pleistocene and early Holocene foragers adapted to changing environments at a global scale. Indeed, a number of similarities recognized over this period in the cultural development between the foragers of the Japanese Archipelago and the Levant require explanation beyond a local history. Importantly, this comparative analysis can only be possible through archaeological data from these two regions, which are the two best available in Asia because they are the subjects of the most intensive archaeological research.

Poster Presentation

The lithic assemblages of Nahal Yarmuth 38: a new PPNB site in central Israel

Dana Ackerfeld*, Anna Eirikh-Rose, Hai Ashkenazi, Katia Zutovski and Avi Gopher

*Tel Aviv University

Excavation at Nahal Yarmuth 38, a small Neolithic site in central Israel, exposed rich MPPNB strata. Five rectangular structures with multi-layered plaster floors, under which many burials were found.

The PPNB flint assemblage studied so far and presented here comprises two major components:

- a. A 'Hollywood' industry made of high quality colorful raw materials, that contains an extraordinarily high number of tools, many of which were shaped on blades knapped off bidirectional (Naviform) cores. Cores and evidence for on-site knapping of such blades or shaping such tools are evidently missing. Sickles are by far the most prevalent tool type, arrowheads are dominated by Byblos and Jericho points while Amuq points appear in small numbers. Other tool groups present include awls and borers, burins and scrapers. Notably, the assemblage yielded no bifacial tools.
- b. A parallel, possibly locally made industry using different (local?) raw materials and shows a totally different character. A fully represented *Chaîne Opératoire* is present including raw material blocks, cores, CTEs, primary elements, blanks, and tools. This is more of an *ad-hoc* industry, flake dominated and with a few informal ('non-Hollywood') tools made mostly on flakes.

The first industry was possibly imported to the site. The missing stages of the *Chaîne Opératoire*, mostly the lack of any sign for raw materials and cores, the very low or actually missing CTEs that may be relevant to the production of the blades on which most of the tools are shaped, and the fact that shaped tools appear in an exceptionally high percentage – all suggest that this assemblage does not represent an on-site knapped industry. This further suggests that the site was not a common active occupation site and that the tools were perhaps brought from settlement/occupation sites as finished flint items. The purpose of having such an assemblage at a site like Nahal Yarmuth 38 is to be investigated but, we may say at this point that single blades and tools (sickle blades and arrowheads) were deposited on the otherwise quite 'clean' plastered floors, or in graves. The selection of tool types brought to Nahal Yarmuth 38 still needs an explanation too, as it is most probably not an accidental collection but rather one that is intrinsically related to the activities carried out at the site. The second industry could represent an *ad-hoc* production sustaining the needs of visitors to the site.

Shells from Nahal Yarmuth 38

Heeli C. Schechter*, Katia Zutovski, Anna Eirikh-Rose, Hai Ashkenazi and Avi Gopher

*The Hebrew University of Jerusalem

The site of Nahal Yarmut 38, located in the Judean lowlands of Israel, includes strata from the PPNB, featuring a unique series of rectilinear structures with plastered floors and multiple intramural interments, and a partially overlapping Pottery Neolithic layer. An exceptionally large shell assemblage was found at the site and is currently under study. Preliminary observations were performed on the entire assemblage while stratigraphic separation and accurate counts are on the way.

Shells originating in land, freshwater and marine environments were found at the site, here we concentrate on the marine shell assemblage. The taxonomic makeup of the assemblage is dominated by Mediterranean bivalves – namely *Glycymeris* sps., *Acanthocardia tuberculata* and *Cerastoderma glaucum*, with the occasional *Donax trunculus*. The gastropods include several Mediterranean specimens of *Hexaplex trunculus*, *Semicassis granulata*, *Columbella rustica*, *Tritia gibbosula*, *Naria spurca* and possibly others. A small, possibly Red Sea, *Cypraeidae* was also noticed.

The frequency of worked shells is very low, which is the common in Neolithic sites. The style of products also seems to be of the common types – a cassid lip, several *Tritia gibbosula* perforated on the right side of the aperture, *Naria spurca* with a grooved perforation on the seam between the dorsum and the aperture base, and more. One *Glycymeris* also has remnants of orange-red pigment inside.

The most striking aspect of the shell assemblage from Nahal Yatmut 38 is its sheer size, with land, freshwater and marine shells probably numbering in the thousands. The assemblage is large both in itself as well as compared to the size of the site, the excavated volume, and in comparison to other material culture categories such as chipped stone. Additionally, in at least two cases, marine shells were found in association with human burials. This exceptionally large marine shell assemblage and some of its depositional patterns presumably reflect a special attitude towards shells and highlights their unique roll at the site.

Diachronic change in raw material procurement and use during the Upper Palaeolithic and Early Neolithic of the southern Levant

Hannah Parow-Souchon and Christoph Purschwitz

Lithic raw material analysis is as of yet an undervalued aspect of lithic studies in the Near East, yet holds many interpretative avenues to understand mobility, economy and social organisation of past societies. This case study focuses on the diachronic comparison of Upper Palaeolithic to Early Neolithic lithic raw material acquisition and use in the Greater Petra Area, Southern Jordan. It particularly aims at tracing and understanding differences in chert procurement and use of groups that differ in lithic tradition and socio-economic setting yet share the same lithological environment. The assemblages of nine Upper Palaeolithic to Early Neolithic sites are classified according to the raw material classification system developed for Neolithic Basta and the used sources are identified via classical pedestrian survey. A minimal distance analysis (MDA) via least cost isochrones is used to determine the effective walking distance to the identified sources. These results are then tested with multivariate statistics (canonical correspondence analysis) for the validity of hypothesised diachronic trends. Significant differences in between Upper Palaeolithic and Neolithic as well as Middle and Late PPNB chert procurement distances could be proven. A further difference in chert acquisition effort for bidirectional blade production and non-bidirectional blade production could be proven within the sample of PPNB sites. Altogether only for the specialised and sophisticated *chaînes opératoires* of the Early Ahmarian narrow-fronted concept and the bidirectional blade production of the PPNB specific investment to procure high-quality raw materials can be observed. Least-effort considerations are the determinant for the other Upper Palaeolithic cultures as well as for the household level production during the PPNB. A consistent need-based behaviour thus can be reconstructed to shape human chert-acquisition behaviour.

**Traces and function: the case of "ergot" blades and proximal notched blades,
EPPNB Dja'de el-Mughara (northern Levant)**

Fiona Pichon

CSIC, Institut Milà i Fontanals, Barcelone
CNRS, UMR 5133 Maison de l'Orient et de la Méditerranée.

'Ergot blades' and 'notched proximal blades' are two new typological tools that appeared during the 9th millennium in the Levantine area of the Near East. Their particularities are having two lateral notches –located on one edge of the blade (ergot blade)– or proximal – both opposite to one of the end of the blade (notched proximal blade). While these tools have only been the subject of functional study very punctually, it has often been argued that these notched corresponded to a hafting system to use them as a knife.

In this poster, we present the technological and functional analysis of these tools coming from the Neolithic site of Dja'de el-Mughara, located in the northern Levant (Syria) and occupied during the 9th millennium (Early PPNB). Results obtained demonstrate that these types of tools are really complex, reflecting the new concerns of the first agricultural societies during the so-called Neolithization process.

Practical and symbolic obsidian function(s) in PPNB societies: interpretative insights through a revision of technological and traceological approaches

Maria Rosa Iovino

Italian Institute of Human Paleontology

Early and Middle PPNB phases are characterized by broad-spectrum subsistence patterns, an increase of the ungulate domestication process, changes in chipped stone technology and, since the end of Early PPNB, a wider movement of people and goods. Obsidian economic exploitation and technological experimentation, due to the push from interaction/networks and growing social complexity, evolved and spread through the so-called Pre-Pottery Neolithic B phase.

Obsidian, a natural volcanic glass, is a hard, reflective, brittle, amorphous matter that can provide very sharp edges when broken and knapped and can also be used to perform other tasks.

Obsidian, due to its peculiar matter structure, required experimentation and the development of specific knapping know-how. The pursuit of its best quality outcrops is testified by the raw material workshops found near specific volcanoes like the central Anatolian ones.

The pressure technology to produce obsidian items, attested since the X-IX millennium BC from sites located in Upper Mesopotamia, developed and became a more common reduction core trend during PPNB, even if scholars have often observed recognizable regional differences in the blade/bladelet *debitage*.

The development of a more schematic and standardized lithic technology has been interpreted as the result of cognitive interaction, acquisition and detection/reinterpretation of useful techniques, from which were generated greater innovations and processes of change. In this contribution, also based on a revision of previously published data by other authors on Early and Middle PPNB identification methods of rituals, I will look to incorporate and discuss data from lithics (technology, traceology) and from the site's context in order to reveal potential unrecorded symbolic practices and their tie-in with mythologies.

Innovation, adaptation or development? The non-tool use of obsidian in the PPN

Elizabeth Healey and Stuart Campbell

University of Manchester

The exploitation of obsidian to make tools has a long history and shows a marked increase during the PPNB. It is also at about this time that some communities start to use obsidian in other ways, although the reasons are not immediately obvious.

The initial repertoire of the objects that are made is limited, consisting mainly of small decorative items and occasionally some inlays in composite objects. Prior to this, ornamental items, especially beads and pendants, had been made of other novel and exotic materials including shell and stone and the subsequent addition of obsidian to the raw materials chosen may simply have been part of this pattern. On the other hand, unlike the other materials, obsidian was also used as a tool-stone and perhaps its use for the manufacture of beads and other things in the PPN was to establish it as something special – a response to its increased popularity, as well as making statements of identity and affiliation or may be even status. Its shiny appearance and its transformation into distinctive objects may have helped it stand apart from similar objects made of other materials.

These and other questions are part of a much wider multidisciplinary investigation of obsidian use by us and others, and while we do not claim to have answers, the purpose of this poster is to demonstrate the potential value of including objects made of exotic stone in our studies of lithics in the Near East, rather than always treating them as a separate category. As well as summarising what we know about such objects in the PPN, we will highlight some of the aspects that we want to investigate in more detail. Our aim is to look beyond them as ‘different’ objects, while at the same time acknowledging that they might have had a particular, distinctive role. Our study sets out to explore how things like the choice of a particular raw material, its provenance, the methods and skills used in the manufacture of such items compare to other aspects of lithic technology. The objects could not have existed in isolation and ultimately we need to incorporate them, in an informed way, into our investigations and interpretations of the use of obsidian and of the pre-pottery Neolithic more generally.

A new site in the volcanic Cappadocia (Anatolia): Kayırlı-Değirmenyolu

Semra Balcı and Çiler Altınbilek-Algöl

Istanbul University

Kayırlı-Değirmenyolu is located in the town of Kayırlı which is on the north of Göllüdağ, on the northwest of the central district of Niğde. The area was a subject to research as a part of the “Niğde Prehistoric Survey Project” and compelled attention with its remarkable obsidian chipped stones. Among the obsidian chipped stones, numerous cores and knapping debris besides tools of various forms (scrapers and pressure retouched oval points ...) bearing the characteristics of the Neolithic Period, as well as stone, bone and grinding stones were observed. The absence of pottery dates the settlement to Pre-Pottery Neolithic. Excavations were started in July 2019 and significant results were obtained.

During the surveys in the region in previous years, field surveys were conducted on the designated routes between Kayırlı, Kömürcü and Erikli Dere, which are known to have the largest obsidian veins of Göllüdağ. Since Değirmenyolu was within the boundaries of Kayırlı Town, it remained outside these routes. During the research, various natural obsidian sources, obsidian workshops and camp sites were found. In addition, it is known that Göllüdağ obsidian sources are used extensively throughout the period both in and outside the region. It is thought that Kayırlı-Değirmenyolu is an important Neolithic site due to its location and its extensive obsidian findings and will provide important informations about the circulation of obsidian raw materials.

Results of the pilot study on the computer modelling of the spread of pressure technique from the Near East to Aegean

Bogdana Milić*, Adrian Timpson, Barbara Horejs and Mark G. Thomas

OREA, Austrian Academy of Sciences

This poster presentation delivers the first outcomes of the pilot study concerning the computer modelling done for the spread of pressure technique from the Near East to Aegean, integrating the data from a long sequence from the 10th until the 7th mill. BC. The project, which was primarily designed to collect and present large datasets available from the published studies and first-hand analyses of the Neolithic chipped stones, aims to trace routes of the Neolithic spread based on the circulation and diffusion of lithic technologies, using pressure technique for blade making as the main marker.

The first results regard two cultural and chronological levels – the early appearance and distribution of pressure technique in the Pre-Pottery Neolithic of the Near East (10th–8th mill. BC), and the spread of the technique outside of the Near East, with the end of the PPN and beginning of the PN into western Anatolia and Aegean alongside the first farmers (7th mill. BC).

The study follows the data based on presences and absences of pressure technique in archaeological sites with a strong correlation with the radiocarbon dates. Additionally, obsidian proportions from the sites of interest in the Aegean basin during the 7th mill. BC are taken into account, as it appears that the circulation of raw materials possibly triggered an inter-site distribution of pressure technique and its rapid spread after the introduction of the Neolithic in this region. This case study offers a basis for testing similar models for understanding borders in the use of different chipped stone technologies in the Near East during the PPN, which is currently a study in progress.

The project combines different methodological approaches in archaeology and computer modelling, with the hypotheses on the demographic and cultural processes shaping the spatiotemporal distribution of the modes of pressure technique used in blade production. The range of modelling techniques are tested in the project, among which the main ones are Generalised Linear Models (GLMs) and Bayesian network analysis. Finally, the Phylogenetic Comparative Method will be used to estimate parameters of the mode and tempo of pressure technique development using a range of hypothesized phylogenetic relationships of early Anatolian farming populations, based on other material culture data.

Regional variability of obsidian pressure blade technology in the Neolithic of the South Caucasus

Fumika Ikeyama, Farhad Guliyev and Yoshihiro Nishiaki

The University of Tokyo

This paper examines local variations in obsidian pressure blade technology with a view to better understand the Neolithization process in the South Caucasus. Obsidian pressure blade production has been considered an important technological element of the South Caucasian Neolithic, supposedly reflecting links with the Neolithic of Anatolia and Upper Mesopotamia to the south. Thus, archaeological records of this technology should provide important insights into the Neolithization process of the region, which is believed to have started a few millennia later than in, despite with close ties with the Fertile Crescent. However, scarcity of detailed technological analysis has prevented it from placing the South Caucasian tradition(s) in a supra-regional context of the West Asian Neolithic. Moreover, regional variations within the South Caucasus have not been elucidated.

To shed new light on this topic, this paper presents a case study of obsidian blade technology at the site of Göytepe, one of the earliest Neolithic settlements in the Middle Kura Valley (early-to-mid 6th millennium B.C.E.), west Azerbaijan. The first step was to identify "pressure blades" properly. In addition to empirical criteria applicable for examination with the naked eye, this study employed metric criteria in identification. The microscopic investigation of distinctive fracture wings visible on the ventral surface of obsidian products, along with a replication study, allowed a more precise identification of pressure blades and reconstruction of their production processes at this site. As a second step, a comparison of the reconstructed processes with those inferred from the literature on the related sites in different regions was made. This revealed a regional variability in the pressure blank production technology in the South Caucasian Neolithic, especially between the north and the south flanks of the Lesser Caucasus Mountains, represented by sites like Göytepe and those on the Araxes Valley, Armenia, respectively. To sum up, the findings indicate a regionally varied process of Neolithization in the South Caucasus, negating a simple view that regards an import of the Neolithic technological package from the south to the north.

The Mesolithic and Neolithic flaked stone assemblages from Damjili Cave, west Azerbaijan

Yoshihiro Nishiaki*, Azad Zeynalov, Mansur Mansurov and Ejder Babazade

*The University of Tokyo

Stratigraphic excavations in the last decade in Azerbaijan, Armenia, and Georgia show that the Neolithic society emerged in the southern Caucasus at the beginning of the sixth millennium BC, almost simultaneously on both the northern and southern sides of the Lesser Caucasus Mountains. However, the relationship between the new society, supposedly established with influences from the Neolithic cultures of southwest Asia, and the indigenous hunter-gatherer society has remained unclear due to the lack of known Mesolithic sites of the late seventh millennium BC. Our excavations at Damjili Cave in 2016–2019 yielded cultural layers of the late Mesolithic, which are precisely the type of evidence needed for this research. Moreover, they revealed the early Neolithic levels as well, having provided the first opportunity to examine the Mesolithic-Neolithic interface in the southern Caucasus at a single site. In this paper, we report our comparable analyses of the lithic assemblages of these periods. The results, supplemented by data from the early Neolithic sites of Hacı Elamxanlı Tepe and Göytepe, show both continuities and discontinuities over the Mesolithic-Neolithic interface period. Given the near-absence of a gap in radiocarbon chronology, the transition/replacement is considered to have been a very rapid cultural process involving contributions from both local and incoming societies.

Late Neolithic in the Shahrizor Plain, Iraqi Kurdistan: a new evidence from Shakar Tepe, the excavations in 2019

Takahiro Odaka*, Osamu Maeda, Kazuya Shimogama, Yuichi S. Hayakawa,
Yoshihiro Nishiaki, Nawshirwan A. Mohammed and Kamal Rasheed

*Kanazawa University

The Shahrizor Plain is an intermontane valley located in the eastern part of the Sulaymaniyah Governorate, Iraqi Kurdistan, where its local prehistory is gradually coming into view through various ongoing investigations during the last decade. However, archaeologists have struggled to explain an apparent hiatus existing in the local Late Neolithic settlements between the end of the seventh and the middle of the sixth millennium cal. BC. To fill this gap, we started a new field project at Shakar Tepe in September 2019.

The excavations of the first season resulted in revealing the prehistoric deposit with more than 5 meters in thickness lying on the virgin soil. Most parts are likely to belong to the Late Neolithic period, although the Ubaid layer was also identified in the uppermost level of the excavated trench. The preliminary typological observation of the ceramic assemblage suggests that the Late Neolithic occupation can be divided into at least two phases. The earlier assemblage, which may be dated to the late seventh millennium cal. BC exclusively consists of coarse plant-tempered wares, while the later one demonstrates some varieties, such as “Hassuna-like” fine incised wares and fine burnished wares, which are probably dated to the end of the seventh millennium cal. BC.

The lithic industry shows fundamental difference from the tradition of the Mlefatian industry, which is characterized by the production of bladelets by pressure technique using bullet shape cores and typical to the Neolithic sites along the Zagros foothill. Instead, it is characterized by a unique type of very large and crude blades made of local chert.

This new evidence possibly fills a part of the chronological gap in the local archaeological records and implies the existence of the discrete material culture in this region, which has never been clear so far.

**Technological variability during the early Pottery Neolithic of the Levant:
a view from Tel Izhaki, a recently discovered early PN site in the Jezreel Valley,
Israel**

Alla Yaroshevich*, Dan Kirzner, Edwin van den Brink, Elizabeta Boaretto and Noam Greenbaum

*Israel Antiquities Authority

The only recently excavated early Pottery Neolithic site of Tel Izhaki yielded a relatively small but variable assemblage of flint artefacts. The assemblage exhibits continuity with the Pre-Pottery Neolithic period, expressed in bipolar removal of blades and the presence of particular PPN tool types, such as large arrowheads. In addition, alongside the Yarmukian component dominating the assemblage, a substantial number of artefacts characteristic of the Lodian (Jericho IX) culture was found. The phenomenon of Yarmukian artefacts being present alongside Lodian (Jericho IX) items, also characterizes the pottery assemblage retrieved from the site.

The find contexts –semi-subterranean structures and stony pavements– leave little room to explain this phenomenon as a mixture of chronologically different deposits. In this respect the close proximity of Tel Izhaki to several other early Pottery Neolithic sites recently excavated in Jezreel Valley and its close surroundings is of importance. These sites show various combinations of Yarmukian and Lodian (Jericho IX) elements in both the flint and pottery assemblages, the presence or absence of stone-built, rectilinear dwellings, anthropomorphic figurines etc. Notably, most of these sites also show a well-defined, Pre-Pottery Neolithic context. All in all, the early Pottery Neolithic sites in the Jezreel Valley reveal a rather variable and complex picture regarding the variability of the associated material culture and the settlement type/site function.

Investigation of ground stone function in Hormangan, a Neolithic site in the south of Iran

Morteza Khanipour* and Sepideh Jamshidi Yeganeh

*The University of Tehran

Usually, ground stones were found beside the other material culture in prehistory sites, often they were studied as tools for preparing and production of food. However, ground stone tools are mostly considered in relation to the emergence of agriculture as they were seemingly produced and applied for food preparation. Thus, they are usually known as the popular prehistoric implements, especially since the Neolithic beginning onward. In addition to subsistence and food processing, special analysis, social structure and the women's roles in the past could also be paid attention by the consideration of ground stone tools. Through archaeological surveys conducted in the Bavanat River Basin, in Fars province, Neolithic pottery was recovered from the Hormangan site. An excavation was conducted at the Hormangan site, in order to establish the absolute and relative chronologies of the Neolithic era in the Bavanat region. The excavation sought to understand cultural characteristics, investigate subsistence strategy according to studies based on vegetal and bone finds and regional and intraregional interactions. Excavations showed that there were two phases of settlement at this site. The older phase, with its lack of structures as well as the presence of numerous ovens and ash dispersion, demonstrates nomadism and the lack of sedentary occupation. On these deposits, the stratiform architecture, including numerous rooms and spaces, was identified. By comparing the findings of this site with the sites of the Kur river basin and experiments on wood charcoal and bone samples, the Both phases are related to the second half of the 7th millennium BC. In Hormangan site that was excavated, various ground stone found includes Grinding slabs, Hand stones, and pestles. The purpose of the current study firstly is typology and classification of ground stones in Hormangan site, then propose a different function for these artifacts. These tools made of Limestone that has minimum scrubbing and erosion for grinding plant. The lower part of the ground stone is amorphous that shows they keep in the ground and the surface is flat or slightly concave that categorized in flat grinding slabs. Hand stones are rubbles that were used for knock or fragment that caused the signs of a stroke on the surface. The remarkable point is that on the surface of one of the grinding stone and two hand stones trace of reddish ochre is visible, also this color clearly shown on the floor and walls of two building room. FTIR and XRF analysis have been done on some color samples from grinding stones, hand stone and the painted walls that show they have used the similar origin of reddish ochre. According to these results, it is possible to suggest at least dual function of ground stone include food production and preparing ochre for painting purpose for the stone artifacts that were found in Hormangan site.

The evolution of basalt bowls from the Late Pottery Neolithic to the Chalcolithic period in the southern Levant

Ianir Milevski

Israel Antiquities Authority

Basalt bowls are a notorious component of the lithic assemblages in the Late Pottery Neolithic and Chalcolithic periods of the southern Levant. They were studied on different levels, technologically and typologically. Basalt sources for the vessels, distribution patterns and symbolic components in them were analyzed as well.

In this presentation we will analyze all these components in order to establish the evolution in shape, decoration and patterns of production and distribution against the social and economic changes of the southern Levantine Neolithic and Chalcolithic cultures. This evolution will be combine with that of the flint and pottery assemblages to found if the evolution of these artifacts is related to chronological, regional or other parameters and considerations.

LPPNB building stones: craft and cognition

Hans Georg K. Gebel
Free University of Berlin; ex oriente

Among the PPN stone craft studies, the procurement, fabrication and recycling of building stones is a rather neglected chapter, despite these products represent an essential sector of Neolithic life and stone working and life, with skill spheres strongly related to the ground stone and other heavy-duty tool production. By the example of LPPNB's Basta and Ba'ja building stones, made from certain qualities of sand and limestones, the various sectors and traits of Neolithic building stone "engineering" (including earthquake pre-caution) are discussed, offering a holistic approach which includes the behavioural and cognitive aspects behind its technological and socio-economic matters.

In terms of empiric evidence, the preferences and opportunism in off-site mining, favoured banked stone qualities, intended breakage sizes and shapes, and initial dressing is discussed with reference to technological and minimum work-input strategies and pragmatism; e.g., "cleavage pragmatism" is a characteristic of the Ba'ja and Basta building stones. There seems to exist a rough dimensional building stone understanding (*sensu* the observable trapezoid-planoconvex horizontal sections and specific size ranges) in Greater Petra Area's LPPNB, the latter certainly also influencing the choice of suitable quarrying areas. In terms of "primary production", most of the building stone raw material is selected from parts of slabs with parallel surfaces, skillfully split from banked bedrock layers during initial mining operations. It can't be excluded that sorts of thermal quarrying was known.

On-site, masons applied clear strategies to finally rectify the faces and edges of building stones while no such is attested, of course, for the final flaking removing disturbing extensions of the stones' in-wall parts before they were set into walls. Split, semi-finished and completely finished (rare!) faces are attested with building stones; flaking attests angle ranges around 90° and the use of hard hammers, which is extremely demanding for the tough Disi sandstone qualities.

Linear setting styles are characteristic for LPPNB stone courses, showing similar heights of horizontally neighbouring stones; vertically neighbouring courses very often show alternating heights. Stone flakes were used for wedging joints between stone courses. It is most likely that aesthetical standards existed for wall faces in the built LPPNB environments. However, quite a number of walls, buttresses, and other architectural features including their repairs and vertical extensions may show *ad hoc* or opportunistic stone selection and wall construction; walls with considerable shares of field stones were constructed, too.

Not only building stones were split and pre-shaped at the near-site quarrying areas: Flagstones, lintels, pavement stones, the thin cover stones for burials, and very thin blanks for paletts or the discs transformed into sandstone rings, and other, were products arriving from the quarries, too.

The role of LPPNB building stone recycling is a most difficult subject, as also subjects related to preservation are. The stones' various resistibility, the duration of use abrasion of exposed stone faces, slow-energy impacts like slope pressure, and other, do not easily allow to conclude on stone or wall biographies – especially if they contain recycled stones.

Gender-based division of labour between household members: an investigation from Tell el-Kerkh, northwest Syria

Sari Jammo* and Akira Tsuneki

*The University of Tokyo

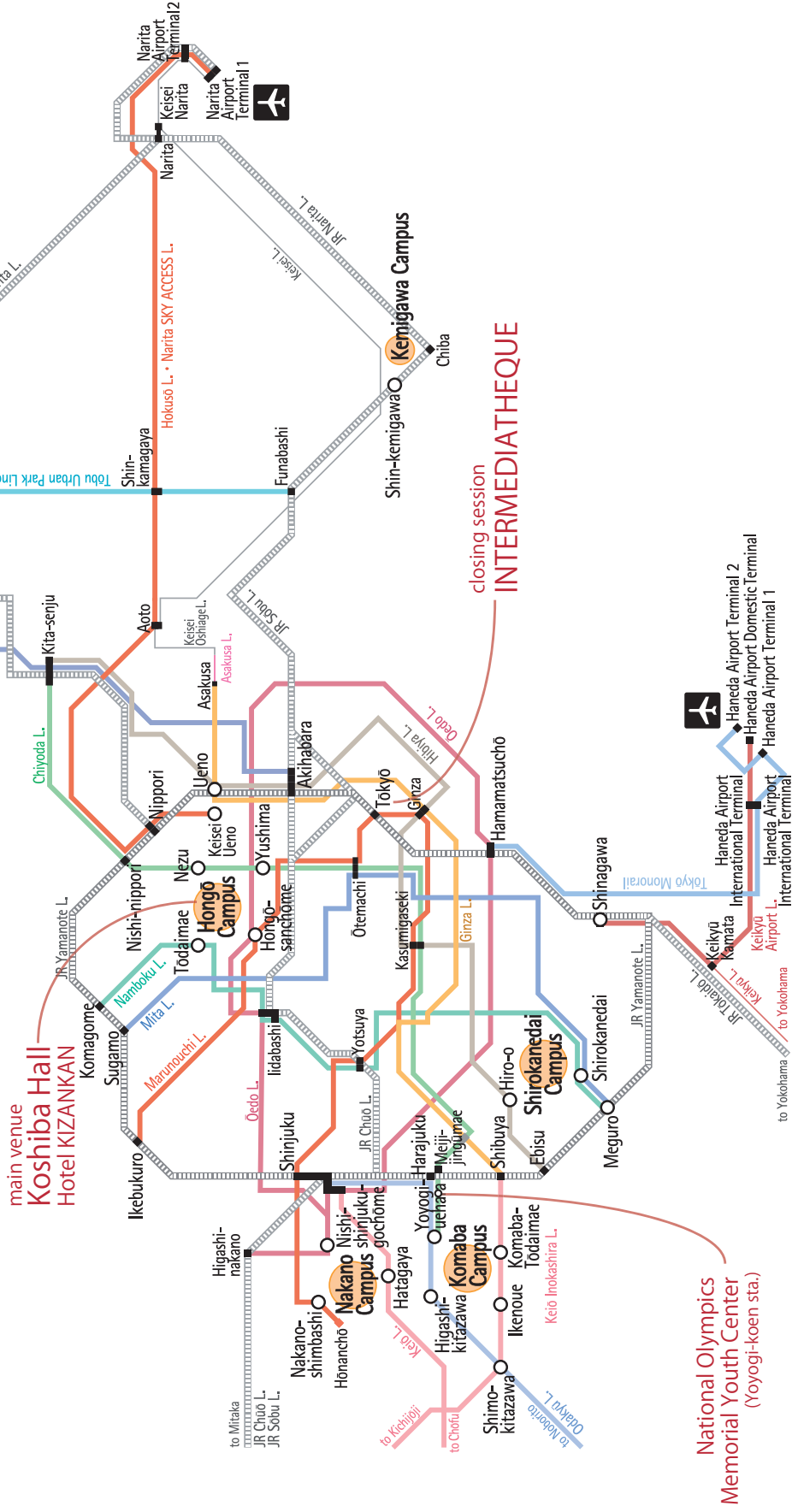
Tell el-Kerkh is a large complex site consist of three neighboring artificial mounds located in northwestern Syria, in the Rouj Basin, Idlib governorate Excavations from 1997 to 2010 have revealed a long sequence of occupation extends from the PPNB to the Byzantine periods. The most impressive discovery at the site was the outdoor communal Pottery Neolithic cemetery in the central area. The cemetery was confirmed within layers 4–6 of the Rouj 2c phase, dated between 6400–6200 cal. BC, and revealed 244 individuals, which suggests the continuous use of the cemetery over some hundreds of years. The cemetery provided us with plenty of information about the economic system, funeral practices, craft specialization and the concept of ownership, all of which indicate the existence of a complicated society. About 60 individuals were accompanied with various kinds of grave goods bearing adorned, symbolic economic and labor significant. This presentation will discuss two remarkable burials accompanied by a significant number of objects. The first is a middle adult male accompanied by an assemblage of chipped stone objects, tools and what seems to be personal belonging. It is suggested that the presence of the grave goods denotes that the tomb owner was engaged in flint knapping. The second is an adult female accompanied by a number of bone implements such as caprine metacarpal and number of bone awls and other objects. It was supposed upon on the various objects discovered with her that she tended to engage in weaving. The presence of only two of 244 individuals uncovered from the cemetery produced these kinds of grave goods bring into a question about the identity of these two individuals. Most likely, they were skilled craftsmen at Kerkh society. If this is the case, it can be asserted that there was a gender-based division of labour in the Kerkh Pottery Neolithic society.

Access Map

○ Nearest Station (Walk or bus)

■ Junctions

See campus maps for bus/walking routes from nearest stations.



How to get to the conference venue (Koshiba Hall) / Hotel KIZANKAN

Koshiba Hall (Faculty of Science, Building 1)

Hongo campus, The University of Tokyo, Hongo 7-3-1, Bunkyo-ku, Tokyo

Hotel KIZANKAN

Hongo 4-37-20, Bunkyo-ku, Tokyo: Tel: 03-3812-1211

The nearest metro stations:

- Hongo-sanchome (M22, Marunouchi metro line / E08, Oedo line) for Koshiba Hall / Hotel KIZANKAN
- Todaimae (N12, Namboku metro line) for Koshiba Hall
- Nezu (C14, Chiyoda metro line) for Koshiba Hall

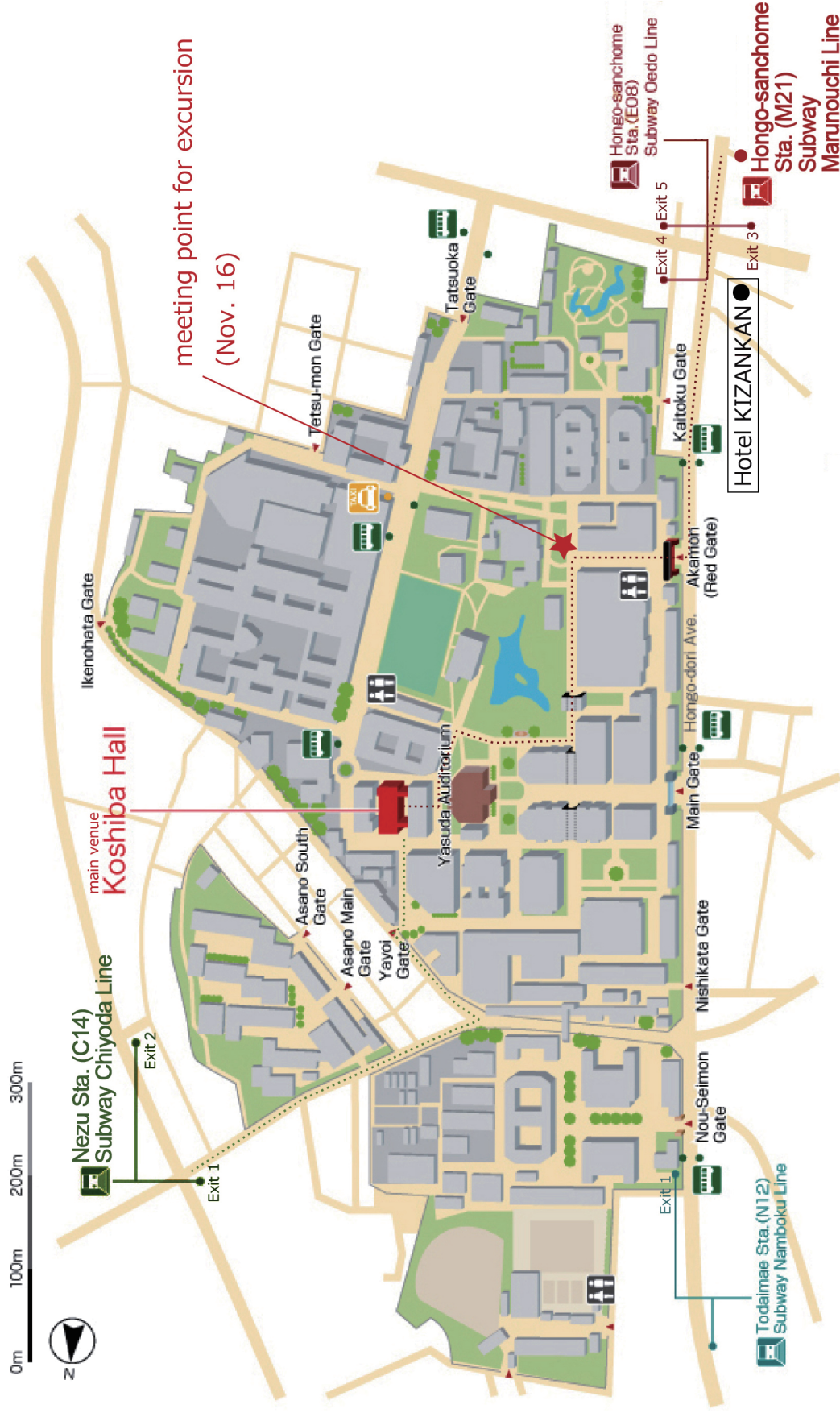
Access from Narita Airport (60 km away):

1. Train & taxi:
Take the Keisei Skyliner train to Keisei-Ueno station (2,400 JPY) and get a taxi to the hotel/Koshiba Hall (about 1,500 yen).
2. Train & metro (subway):
Take the JR Narita Express train to Tokyo station (3,000 JPY) and change for Marunouchi metro line (bound for Ikebukuro) to Hongo-sanchome station.
3. Airport bus & metro (subway):
Take an airport bus to Tokyo station (1,000~2,800 JPY) and change for Marunouchi metro line (bound for Ikebukuro) to Hongo-sanchome station.

Access from Haneda Airport (20 km away):

1. Monorail, JR train & metro (subway):
Take the Tokyo Monorail to Hamamatsucho station, change for the JR Yamanote line train to Tokyo station and change for Marunouchi metro line (bound for Ikebukuro) to Hongo-sanchome station.
2. Keikyu train, JR train & metro (subway)
Take the Keikyu line train to Shinagawa station, change for the JR Yamanote line train to Tokyo station and change for Marunouchi metro line (bound for Ikebukuro) to Hongo-sanchome station.

* Notice for travel on Sunday 16, November: the JR Yamanote line (between Osaki-Tokyo-Ueno stations) and JR Keihin-Tohoku line (between Shinagawa-Tamachi) will be suspended due to planed engineering work.



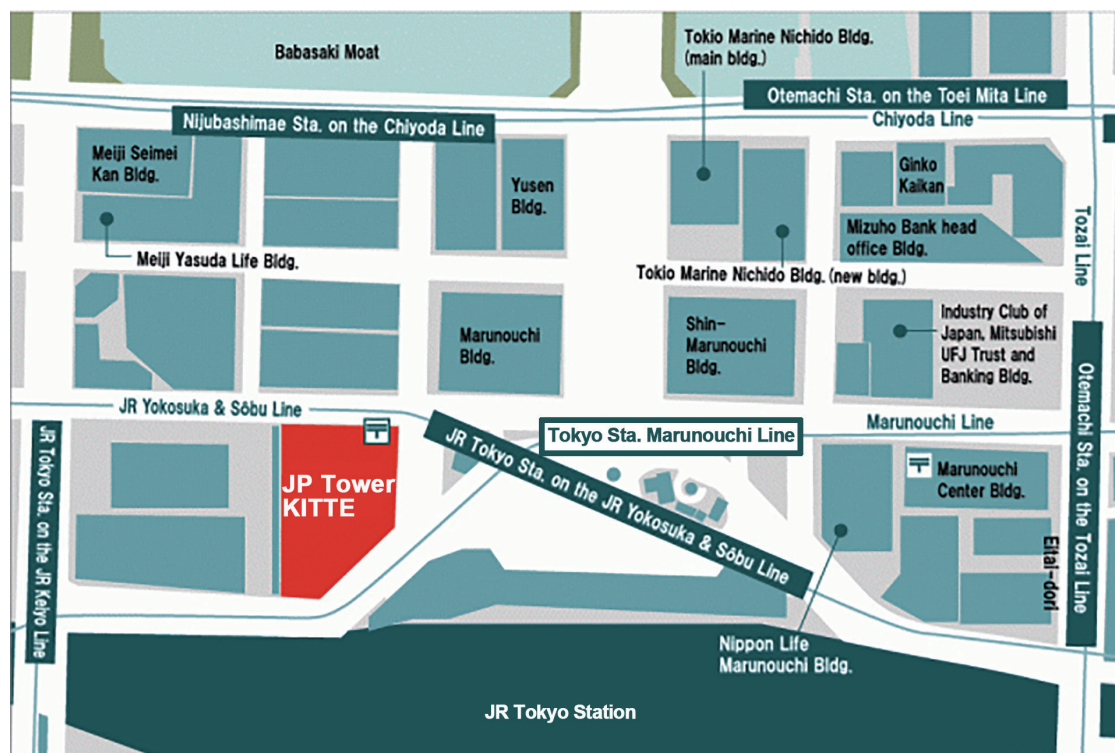
INTERMEDIATHEQUE (IMT, in JP Tower KITTE building)

Address: KITTE 2-3F, Marunouchi 2-7-2, Chiyoda-ku, Tokyo

<http://www.intermediatheque.jp/en>

Travel from the Koshiba Hall to the IMT (Friday 15, afternoon)

Take Marunouchi metro line from Hongo-sanchome station to Tokyo station. Take the south exit to the underground passage directly connected to the entrance of the KITTE. The entrance of the IMT is located on the second floor.





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