



Seminar for Arabian Studies 2017

Poster Abstracts

Bin Ḥimd House: a case study of a merchant's house in Old Jiddah

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Jiddah, the largest Hijazi coastal city, is the last bastion of the region's historic architecture. Houses in Old Jiddah (al-Balad), have a variety of sizes and designs. It is an area of many cultures as it was inhabited by people of many different backgrounds for centuries. The Hajj season played an important role in its diversity. People of Jiddah worked in different occupations, however, the majority were either fishermen or merchants. This poster explores al-Balad's merchants' houses by focusing on Bin Ḥimd house in the neighbourhood of al-Maḏlūm. Although it is one of the largest houses in the city, Bin Ḥimd rarely attracts researchers' attention. It is often overshadowed by houses with strategic locations; such as Bayt Ba'ishan in the neighbourhood of Ḥārat al-Shām and Bayt Naṣīf in Ḥārat al-Yaman. Bin Ḥimd house is particularly interesting as it is composed of three properties linked together for an extended family. This poster illustrates it from several perspectives; historically, architecturally and socially. Unlike many houses in the old town, Bin Ḥimd was never let after the family left it in the 1970s, hence, it has remained unchanged. Understanding this house paves the way to comprehending the variety in the city's architectural heritage, especially with reference to merchants' houses.

Keywords: Jiddah, Hijaz, domestic architecture, Red Sea houses, merchants

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Remembering the oasis in the pre-oil age: traditional agricultural practices at Hīlī oasis, al-'Ayn

Fatema Abdullah Al Hammadi, Madya Hamdan Al Mehairbi & Timothy Power

with

Maitha Salman Al Zaabi, Julien Charbonnier, Khuloud Ibrahim Al Hammadi, Peter Sheehan, Omar Salem Al Kaabi, Mohamed Mater Al Dhaheri, Jawaher Khamis Al Mansoori, Mahra Khaled Al Azizi, Noura Mohamed Al Marzooqi & Thanwa Saleem Al Menhali

Al-'Ain Oasis Mapping Project was set up in 2014 as a collaboration between Zayed University and the Tourism and Culture Authority Abu Dhabi. It aims to explore the origin and development of the historic oasis landscape. The project this year focused on Hīlī Oasis and, in addition undertook survey and excavation work as discussed

as a paper in the Seminar, and it also included an oral history component. We hoped that by interviewing surviving members of the last generation to live and work in the oasis, we might better understand its pre-oil irrigation system and traditional agricultural practices. We were fortunate to enlist the help of Maitha al-Zaabi (National Archive) to deliver training in oral history and Julien Charbonnier (CNRS) to help formulate relevant research questions. This poster presents the results of our interviews and provide a historic context for the pre-oil oasis agrosystem and its modern transformation.

Shell ornaments from Wādī Sharmah 1, a Pre-Pottery Neolithic B settlement along the east coast of the Red Sea

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Wādī Sharmah 1 is the first fully-excavated Pre-Pottery Neolithic B (PPNB) settlement in the Arabian Peninsula. The excavations, that took place over four seasons from 2013 to 2015, revealed some sixty round-to-rectangular masonry structures, where a total of ninety shell ornaments were recovered together with various chipped and ground stone artefacts. This poster presents the archaeological implications of shell products in a broader context. What most attracted our attention is the frequency of Mediterranean *nassa* mud snail shells (*Nassarius gibbosulus*), that account for 14.4% of all the shell ornaments. This percentage is much higher than those of contemporary settlements in southern Jordan and the southern Sinai, suggesting the possibility that the Mediterranean shells were directly traded along the east coast of the Red Sea. The occurrence of a late PPNB flint assemblage represented by 'Amūq-type points and a flint 'Bowlet' also indicates close ties with the southern Levant. This perspective is highly important in tracing the 'Neolithization' process in north-western Arabia and deserves intensive discussion.

Documenting the traditional architecture of Khatba' village

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Saudi Arabia is known of its diversity of culture, environment and architecture. Khatba' village is in a valley that located in the south-west of Saudi Arabia in a mountainous area. Accordingly, this environment determines the building materials, which are stone and local wood. This poster focuses on the building features and material that respect the environmental, social, religious and security factors of the design. However, these factors are different from one region to another in the south-west province because of changes in climatic and geographical conditions in a hilly region. The poster documents the traditional architecture of this village including the main architectural features and materials used to increase the awareness and interest of local people about the importance of maintaining their heritage and culture, as there has been no previous documentation about its architecture.

Keywords: Khatba' village, traditional architecture, architectural features, building materials, documentation

Exploitation of marine resources from the paleo-lagoon of Ruways 1 (Holocene), Sultanate of Oman

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Ruways 1 is a shell-midden facing the Arabian Sea with dates ranging from the end of the seventh to the fifth millennium BC. The occurrence of tombs, hearths, postholes and net-sinkers revealed that the site was settled by humans all along the chronological sequence. The stratigraphy is made of several levels of shells intersected by dense layers composed of vertebrae of small-sized fishes and of natural aeolian sandy layers. The study of the fish remains (NISP: 4465) provided seventeen families of fishes. Most of them were mullets, sardines and sea breams, weighing between 20 to 120 g. These species, along with catfish, highlight the presence of a palaeo-lagoon and a mangrove near the site. The shellfish taxa identified (e.g. *Terebralia palustris*, *Lunella coronata*) also confirm that a lagoon and a mangrove were probably present. Located on an Early Holocene fluvio-deltaic cemented gravel formation, Ruways 1 appears to be an ancient fishing-station, surrounded by different types of environments, directly accessible and exploitable. Among the fishing gear now discovered, a very big hook was found, which surprisingly is not linked to the capture of the various fishes observed in the assemblage. The inhabitants of RWY-1 focused on the mangrove/lagoon fauna for their subsistence but could also have occasionally exploited open sea waters. This study sheds light on the subsistence strategies implemented by Neolithic populations of Arabian Peninsula in constraint and arid environments.

Keywords: mangrove, lagoon, fishing artefacts, mid-Holocene, eastern Oman coast

Islamic pottery from the archaeological site of Dūmat al-Jandal

Simona Berardino (University of Naples, L'Orientale)

In the framework of the 2015 and 2016 excavation campaigns carried out by the Saudi-Italian-French archaeological project at Dūmat al-Jandal, an initial typological study of the ceramic corpus of the Islamic era has been proposed. The corpus is based on pottery collected from the excavation of the urban area (sectors A–B) inside and outside Mārid castle, the ancient acropolis of the historical core of the caravan oasis.

The analysis, which offers a wide field of investigation, will help us to understand a site of strategic importance better, as its stratigraphy covers the entire Islamic era, from the Ridda wars (AD 632–633) until the eighteenth century. The proposed interpretation of the ceramic data will help to provide a key to the history of peripheral territories of the Islamic world, knowledge of which is incomplete. Attention will be given to the proto-Islamic phase and the early centuries of the Caliphate. Through the study of 4000 fragments (142 typologies, out of a hundred thousand fragments), it has been possible to understand the technical level achieved in ceramic production; its changes over time; the function of urban structures under investigation; and, to more broadly, the socio-economic context of the oasis within the ancient Islamic trade system.

The seals of Sarūq al-Hadīd

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Sar  q al-Had  d, in the Emirate of Dubai, is an exceptional site in many ways, from its location in what is currently the most inhospitable part of the country, to the abundance and variety of material it delivers. Equally far away from the coast that offers opportunities for short- and long-distance transportation of goods, and from the mountainous eastern region that provides water and natural resources, the site has produced, over fifteen years of excavation, thousands of artefacts, mainly dating from the first millennium BC, comprising complete pottery jars, metal weapons and tools, softstone vessels, elaborate gold and precious stone jewellery, and shell ornaments. Some of the most remarkable items found at Sar  q al-Had  d are over fifty stamp and cylinder seals, they constitute by far the largest collection of glyptic items from the Iron Age in the Gulf region. This poster provides an overview of the collection, displaying characteristics of the local culture of the Oman peninsula, as well as influences from the neighbouring regions such as Dilmun, Mesopotamia, Persia and Egypt. They offer a crucial key to enable us to understand the technical and cultural melting pot that is Sar  q al-Had  d.

Holocene archaeological landscapes of the al-Jawf region, Saudi Arabia

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In the framework of the Saudi-Italian-French archaeological project at D  mat al-Jandal, a search path devoted to the interaction between the prehistorical anthropic communities and the palaeo-environment during the Holocene is continuing in the northern al-Jawf region of Saudi Arabia. Based on a GIS platform, it involves remote sensing, field surveys and detailed material culture studies, integrated by a geoarchaeological approach. Two cultural units have been identified, relating to two different palaeo-environments: (1) the hunter-gatherers of A  f  n ('Uf  n, northern al-Naf  d) whose habitat developed around an endorheic basin, and dating to tenth to the eighth millennium BC; (2) semi-nomadic kite builders in a palaeo-*widy  n* system of the H  rrat al-H  rrah (H  dhat al-H  rrah) and the Jabal Nejma (Najmah, both H  rrat formations of northern Arabia), dating from Pre-Pottery Neolithic B to Bronze Age. The study of the lithic material focuses on the A  f  n plain: the collected lithic can be dated, on typological and technological basis, between the seventh millennium BC and the sixth/fifth millennium BC. The purposes of the research project are to discover a pattern relating to the exploitation of hydric resources; and to understand the regional and interregional relationships between communities during the prehistoric humid phase.

Gold metallurgy at Sarūq al-Hadīd, Dubai, UAE, in the context of south Arabian jewellery production techniques

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Sar  q al-Had  d is possibly among the most intriguing prehistoric sites in Arabia. Excavations over subsequent years have unearthed abundant production waste and a diversity of beautifully worked artefacts of copper alloy, iron, gold, stone, shell, bone, wood and pottery. Its location in the active dunes of the eastern extension of the Rub' al-Kh  l  , dune fields in the Emirate of Dubai (UAE) and its abundance of artefacts, especially from the early Iron Age (c.1300–800 BC), provide the possibility for new insight into the nature and development of local Iron Age communities and the production, use and handling of their material culture.

A significant artefact group from Sar  q al-Had  d is a wide range of gold artefacts consisting of ribbons, threads and foils together with a diversity of finished jewellery and a smaller amount of depictive gold artefacts. Many artefacts are produced from granulated gold beads and visual inspections may suggest the use of different gold alloys. This poster presents preliminary archaeometric results on variations in working technologies and in gold compositions, and discusses their stylistic and technological connection to jewellery production in the wider region of south Arabia and the archaeological Near East.

Copper metallurgy at Sar  q al-Had  d, Dubai, UAE: early Iron Age copper technologies in a ritual context

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Sar  q al-Had  d is one of south-eastern Arabia's most important and enigmatic prehistoric sites. Ongoing excavations there have revealed an assemblage of archaeological artefacts, mostly of early Iron Age date (c.1300–800 BC), that is unprecedented in its scale and diversity, including thousands of copper, iron, and gold alloy artefacts and hundreds of tons of copper smelting and refining debris. Intriguingly, this material is dispersed across and within a large area of active dunes of the northern Rub' al-Kh  l   desert in an area that currently lacks almost any identifiable settlement remains or resources that might be useful for primary metal production; and in contexts characterized by pervasive ritual imagery related to a snake cult. The site dramatically challenges existing ideas about the nature and development of local Iron Age communities and the socio-economic use of the expanding desert fringe in the first millennium BC.

This poster presents the results of archaeometric analyses on the copper-based remains from Sar  q al-Had  d focusing on the evidence for primary copper extraction and copper alloy artefact fabrication, incorporating the first documented smelting of sulfidic copper ores in the region, the production of a range of copper alloys with zinc, tin and arsenic; and the long-distance exchange of raw materials, finished artefacts, and possibly technologies, across Arabia and the ancient Near East.

Praising the great healer. An inscribed Kassite eye-stone votive bead from the Early Iron Age grave (LCG-1) at Daba, Sultanate of Oman

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This poster presents the exceptional discovery of an inscribed eye-stone votive bead of the Kassite period found within the Early Iron Age grave LCG-1 excavated at Daba (Dibbā), in the Musandam peninsula of the Sultanate of Oman. The burial ground recently discovered at Daba comprises two large collective graves, partly excavated by the Ministry of Heritage and Culture of Oman, dating primarily to the Early Iron Age (LCG-1 and LCG-2), surrounded by clusters of funerary pits. The graves contained hundreds of individuals, mainly in secondary depositions, accompanied by thousands of valuable objects, such as stone and pottery containers, metal tools and weapons and ornaments in hard stones and precious metals.

The eye-stone, found by sieving loose sediments among the human remains in LCG-1, deserves special attention not only because it informs us about the network of interactions established by the community represented in the Daba graves, but also because it has carved on its surface the southernmost cuneiform inscription discovered to date and the only one found in south-eastern Arabia. The three coarsely incised cuneiform signs formed the name of the Mesopotamian goddess Gula of Isin, a goddess of healing and patroness of physicians who had regenerative powers relating to vegetation and fertility.

Keywords: eye-stone, Kassite period, Gula, cuneiform, Oman

Investigation of the Middle and Late Bronze age chipped stone assemblages from Sarūq al-Hadīd, Dubai, UAE

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This poster presents the preliminary results of the analysis of the chipped stone assemblages from Sarūq al-Hadīd, Dubai, UAE. Excavations at the site have revealed substantial deposits dating from the late Umm an-Nar period to the early Iron Age, with considerable numbers of lithic remains recovered particularly in the Wadi Suq and Late Bronze Age contexts (c.2000–1300 BC). A sizable assemblage of stone artefacts and debitage was recovered (N=9,100), with the deposits of sufficient integrity to allow artefact conjoining. Stone was imported to the site as small chert cobbles derived from colluvial and possibly bedrock deposits. Some of these cobbles were used as hammer-stones to reduce other cores on-site by direct hard-hammer percussion. Most of the cores were opportunistically rotated several times before being discarded. This reduction process resulted in bifacial and multiplatform cores. While blade-like flakes are present, blade making was not a focus of the technology. Larger chert flakes were sometimes smashed into segments on an anvil, but only occasionally retouched by the freehand technique. Some flakes produced on-site were selected for backing, creating small microliths (N=64), presumably for hafting in series as weapon or tool armatures. No evidence for pressure flaking or heat-treatment of raw materials is present in the assemblage. Several unmodified flakes appear to have been used in processing soapstone.

While Neolithic stone tool traditions in south-east Arabia have been the subject of much research and are very well characterized, lithic traditions from the third to the first millennia BC in the region have received little

concerted archaeological attention. By describing the newly identified reduction sequence for the well-stratified second millennium BC lithic assemblage from Sarūq al-Hadīd, the poster makes a fundamental contribution to the description and interpretation of stone tool technology in south-east Arabia and the Arabian Peninsula.

Taymā', a northwest Arabian oasis in the Early Bronze Age

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During the Saudi-German archaeological project at the oasis of Taymā', north-west Arabia, third millennium BC contexts were recently discovered that considerably change our perspective on the settlement history and the role of this site during the Early Bronze Age. Stratified deposits with two distinctive types of ceramics, archaeobotanical and faunal remains, have been identified in the centre of the settlement, all of them dated by ¹⁴C to a period covering most of the third millennium BC. To the same chronological horizon belongs the construction of the oasis's outer wall, resulting in probably the greatest extension of Taymā' in pre-modern times. As suggested by associated pottery finds, it is very probable that there was a contemporary occupation of the large cemetery areas south of the oasis. This evidence calls for a new view on the oasis of Taymā' as a major settlement in the region during the Early Bronze Age, challenging existing definitions of the cultural landscapes of the region in the context of socio-economic and political developments. The interdisciplinary poster presents, for the first time, an overview of the different contexts of this period in relation to the topography of the ancient settlement.

Magnetometer survey of a Hafit monumental complex, al-Khashbah, Sultanate of Oman

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A magnetometer survey carried out as part of the Al-Khashbah Archaeological Survey has revealed the plan of two monumental buildings dating to the third millennium BC and the surrounding landscape. Evidence from excavations confirms that this complex date to the Hafit period, marking it as an important site for the development of social complexity in the interior of northern Oman. The results of two seasons of magnetometer survey, conducted in 2015 and 2017, are instructive in two major ways. The fused magnetograms are a record of the prehistoric cultural landscape immediately surrounding Building I and Building XI. Secondly, the two surveys provide a direct comparison of two different geophysical methods of magnetometer survey: fluxgate gradiometry (2015 survey) and total-field magnetometry (2017 survey), that

can aid analysis of survey results. The surveys took place near the geomagnetic equator where the shallow inclination of the Earth's magnetic field can make archaeological interpretation of magnetic anomalies rather complex. This poster is enhanced by an augmented reality layer that displays the distribution of artefacts recorded during a surface survey.

Keywords: archaeological geophysics, magnetometry, archaeological survey, augmented reality, Hafit period, al-Khashbah, Oman

Ritual faunal offerings from the Early Iron Age grave LCG-2 at Daba in the Musandam peninsula, Sultanate of Oman

Elena Maini (*ArcheoLaBio* – Research Centre for Bioarchaeology) & Alma Mater Studiorum (University of Bologna)

The burial complex recently discovered at Daba (Dibbā) in the Musandam peninsula, part of the Sultanate of Oman, includes two large collective graves dating primarily to the Early Iron Age (LCG-1 and LCG-2). This poster presents the ritual faunal offerings discovered in grave LCG-2. This funerary structure (23 x 6 m) was in use continuously from the end of the Late Bronze Age until the Iron Age III (c.1350–600 BC). The grave included hundreds of individuals, twenty-eight in primary deposition and at least 202 in secondary depositions, accompanied by thousands of valuable objects, such as stone and pottery containers, metal tools and weapons and ornaments in hard stones and precious metals. Numerous animal bones have been found in LCG-2, mainly goat, but also cattle, sheep, dogs, horses and fish and, more rarely, even camelids and pigs. The identification of a preferential use of specific portions, mainly skulls and distal parts of limbs, often discovered in direct relation to human bones, suggests the existence of a funerary ritual involving meat offerings. Further evidence for the use of animal bones is the group of fourteen sheep and goat knuckle-bones (*astragali*) with traces of anthropic modifications found in connection a human bones cluster.

Keywords: zooarchaeology, offerings, funerary, Oman

An analysis of spatial relationship between the Umm an-Nar-type tombs and reuse in Bāt cemetery, al-Zāhirah, Oman

Takehiro Miki (Free University of Berlin), Taichi Kuronuma (Tokyo Metropolitan University) & Yasuhisa Kondo (Research Institute for Humanity and Nature, Kyoto)

Certain surface-exposed archaeological features in Oman have collapsed and then been partly reused for later construction. The long-term process of the entanglement of archaeological features from various periods at Bāt has been examined. Bāt is an information-rich site with the largest preserved cemetery of the Umm an-Nar-type tombs of south-east Arabia (fifty-nine tombs), Hafit-type cairn-tombs, Wadi Suq-type tombs, Iron Age tombs, and stone alignments from prehistoric to historic periods crowd together in one place. Whilst developing an integrated database of archaeological features in Bāt, architectural components of the Umm an-Nar-type tombs were documented but almost all the Umm an-Nar-type tombs had collapsed. This implies that parts of these tombs were moved during the Umm an-Nar period or later. In this poster, we applied statistical methods to clarifying the spatial relationship of the archaeological remains to understand the reuse process. We identified spatial clusters of Umm an-Nar-type tombs, but the spatial autocorrelation of the structural components of these tombs were not clearly observed. We also confirmed that reuse activities of later periods (e.g. building stone alignments) affected the collapse of Umm an-Nar type tombs.

Bronze bowls and funerary practices at Mleiha, Sharjah, UAE

Bruno Overlaet (Royal Museums of Art and History, Brussels)

The monumental 'Tomb of Amud' (dated by inscription) at Mleiha (Mulayḥa), has yielded new information on funerary practices. It was constructed, looted, repaired and re-used during the late pre-Islamic era (PIR). Among the finds is a decorated bronze bowl with unusual representations (mythological creatures, African fauna and so on). Comparison with decorated bowls from the Oman peninsula indicates Iron Age Middle Eastern bowls circulated in the region during the PIR. The construction of the tomb is discussed, as well as its repair and re-use. The finds are used to date these phases within the five hundred years approximately that Mleiha was a key site. The bowl and its iconography is compared to other bowls from the Oman peninsula. Its final decoration is dated to the third century BC although the decorated bowl is considerably older. The bowl sheds new light on the use and importance of such bowls in the region. Its unique iconography raises questions on origin and production. The tomb provides insight in the events at Mleiha during the PIR. The timeframe of the plundering and re-use is significant new information.

Keywords: decorated bronze bowl, PIR, Mleiha, monumental tomb.

Late Islamic period fishing industry in the Gulf: the case of Kharab el-Desht, Failaka Island

Agnieszka Pieńkowska (University of Warsaw) & Marta Mierzejewska (University of Warsaw)

This poster is the first study aiming to present the functioning of a fishing village on Failaka (Faylakā) island. Since 2013, the Kuwaiti–Polish Archaeological Mission has been conducting excavation at Kharab el-Desht (al-Dasht), one of the largest Late Islamic settlements located on the island, as well as underwater research of the surrounding coastal zone. The fishing character of the settlement was determined based on the abundance of finds and features related to fishing and fish processing, including net weights, anchors, hooks, and stoves. In the nearby waters, huge stone fish traps used for catching large quantities of fish were found – much larger than the needs of this single village. In the light of this observation, apart from fishing methods, the study also seeks to examine fish processing and storage practices, as well as possible directions of the fish trade and its extent.

Keywords: fish traps, fishing industry, Gulf Archaeology, Late Islamic period, Failaka Island,

The material culture assemblages from the 2009-2016 excavation seasons in the historical core of Dūmat al-Jandal. A preliminary portrait

Marilena Polosa (Università degli Studi di Napoli 'L'Orientale') & Vincenzo Regine (Università degli Studi di Napoli 'L'Orientale')

This poster aims to introduce a catalogue of small finds from the historical area of Dūmat al-Jandal (trenches 1–9 in sector A, located at the foot and inside of Mārid castle, and trench 10 of sector B, outside the 'Umar ibn al-Khaṭṭāb mosque). The excavation campaigns conducted within the framework of the Saudi-Italian-French archaeological project have brought to light many artefacts of different traditions and typologies, which underlines the continuity of the site from the second half of the first millennium BC to the Islamic period; as well as the functions of and cultural influences on the oasis. The study of these artefacts began with a preliminary typological and comparative catalogue that includes the main classes of

collected materials. Because of different production methods variously used with a wide diversity of daily life, economic-productive and cultic phenomena are in evidence with stone tools (grindstones, pestles, mortars, whetstones), terracotta productions (zoomorphic and anthropomorphic figurines, and incense burners) and personal items such as terracotta pipes and paste vitreous bracelets .

The Late Iron Age grave 58 from the Sināw area (al-Sharqiyyah, Sultanate of Oman): a warrior and its historical context

Fausto Mauro (University of Naples 'L'Orientale')

This poster introduces the so-called warrior grave 58 brought to light during archaeological rescue excavations in the Sināw area, al-Sharqiyyah region, carried out by an Italian team in 2014 within the Sināw-Mahut-Duqm road network development. The rescue excavations were supported and promoted by the Ministry of Heritage and Culture and by the Ministry of Transport and Communications of the Sultanate of Oman.

G58 is a pit-grave with a single male crouched on right flank. The tomb contained a rich array of grave goods, including an iron sword with a distinctive silver and ivory hilt, two iron daggers, one bronze ring, one hemispherical bowl and three groups of organic remains. Furthermore, close to G58, two other pits with a kneeling dromedary buried in each have been excavated (G50 and G59). The burials seem to reflect the prestigious position of the male in G58 in a tribal community and his way of living. In addition, at the current state of the study, the panoply could confirm the contacts among south-eastern Arabia, India and perhaps eastern Africa, during the Late Iron Age.

Human subsistence strategies in prehistoric Arabia: the latest zooarchaeological analysis from Sarūq al-Hadīd

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Recent excavations at Sarūq al-Hadīd (Weeks et al. 2017) have unearthed further faunal material dated to the Wadi Suq, Late Bronze Age and Early Iron Age periods (1800–800 BC). This poster outlines results from the latest analysis of these remains.

Material from all phases is dominated by wild species, primarily Arabian oryx (*Oryx leucoryx*), gazelle (*Gazella* sp.), along with other species of wild mammals, reptiles and birds. Marine resources are abundant in the assemblage, with large amounts of fish, coastal birds and some dugong (*Dugong dugon*) present. Sheep (*Ovis* sp.)/goats (*Capra* sp.) are also found in this assemblage, as are small amounts of cattle (*Bos taurus*). Camels (*Camelus dromedarius*) are also found frequently in the material, the domestic status of which is unclear.

These remains demonstrate extensive exploitation of terrestrial wild animals in the region, some of which have not been identified in other faunal assemblages. Links between the site and the coast are clear in this assemblage. The work presented in this poster provides insight into the human use of the desert interior during the mid-Late Bronze Age and Early Iron Age and how this changes our understanding of subsistence strategies during this period.

Keywords: Wadi Suq period, Bronze Age, Iron Age, Sarūq al-Hadīd, subsistence, zooarchaeology

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Insight into the earliest iron technology in south-eastern Arabia: comparative analysis of the ferrous remains from Sarūq al-Hadīd, Dubai, and Muweilah, Sharjah, UAE

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In south-eastern Arabia, the period from 1300–300 BC is conventionally known as the Iron Age, though the evidence for the use and production of iron in the region at that time is both small scale and rare. However, the recent discovery of Sarūq al-Hadīd in the desert of Dubai has revealed more than 200 kg of remains of Iron Age ferrous and bimetallic artefacts that challenge previous understandings and raise questions about the adoption and use of ferrous metallurgy in Arabia (and the Near East more widely). The settlement of Muweilah (Muwayliḥ), located in Sharjah, is the second Iron Age site after Sarūq al-Hadīd to have produced a significant amount (several kilograms) of ferrous remains, including elements of the production sequence such as artefacts and ironmaking slags and production residues that have not been found at Sarūq al-Hadīd. The present research provides insight into the nature of iron technology in south-eastern Arabia, through the investigation of ferrous artefacts from the two sites: typological analysis, study of fabrication techniques via optical microscopy and X-Ray imaging, assessment of the carbon content of the metal by metallography and insight into provenance through analyses of slag inclusions by SEM-EDS and La-ICP-MS. Preliminary results reveal the dominance of different object typologies at each site, but similarities in the overall quality of the metal, which is generally soft iron or mild steel. Chemical analyses suggest a similar provenance for most of the artefacts from both sites, although the slag inclusions in the Muweilah ferrous artefacts and production residues are characterized by greater compositional variation than seen at Sarūq al-Hadīd, possibly indicating that iron was coming to Muweilah from a larger number of sources.

Spatio-temporal analysis of eastern Arabian coast mangroves dynamics in the Mid-Holocene period (6200-2200 BCE).

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The Ja'alan region (Oman), in the easternmost part of Arabian Peninsula, is one of the driest areas on Earth, however many Neolithic and Bronze age shell-middens show mangroves exploitation in this region. Geomorphological surveys along the Arabian Sea coast sabkhas, as part of NeoArabia project, have been undertaken and located a humid palaeo-ecosystem whose spatial extension was larger during the Mid-Holocene. These coastal forests, highly constrained by salinity levels, upstream fresh water and eustatic

variations, but well adapted to grow in intertidal environments, provided favourable habitats for prehistoric societies, and were rich in wood, shells, fishes and birds. Isotopic oxygen studies in Hoti and Qunf caves showed an abrupt north-south division of the Inter Tropical Convergence Zone (ITCZ) (Fleitmann et al. 2007) and monsoons to the south from 6200 BC, modifying rainfalls and the mangroves dynamic. This work deal with Oman's mangrove history with a triple objective: 1) to evaluate coastal humid systems evolution to reconstruct their paleogeography; 2) to build precise climato-environmental history in the eastern extremity of the Arabian Peninsula at high temporal resolution; 3) to compare the acquired data with the fluctuations of the regional populations in a socioenvironmental perspective. We answer to these objectives using multi-proxy analysis (sedimentological, geochemical and palaeo-ecological data) of Suwayh-C2 and Ruwais-C3 sedimentary cores. The preliminary results show a stable mangrove environment between 6000 BC and 4400 BC and an abrupt transition around 4300 BC. Results of Qūrm (Muscat mangrove) surface micro-cores as a modern analogue also bring us new comprehension of the functioning of fossil-mangroves and decadal variations.

Keywords: Eastern Arabia, mangroves, Mid-Holocene, Neolithic shell-middens

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The Polish sector in Sarūq al-Hadīd, Dubai, UAE: first season of exploration

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The international programme of excavations at Sarūq al-Hadīd, an Iron Age site in Dubai in the UAE, investigated since 2002–2003, was joined in 2016/2017 by a Polish team (Polish Centre of Mediterranean Archaeology University of Warsaw) tasked with the exploration of the north-eastern fringes of the main mound. Layers corresponding to the Iron Age II occupation of the site yielded a body of evidence on metallurgical activities (furnace bodies, slag and copper and gold metal scrap), which took place on the surface of the sand dune, very close in the vicinity. Small finds in the form of a decorated steatite bowl, fragmented pottery, copper arrowheads and two daggers, as well as a set of diverse beads represent the population that visited this presumed one-time cultic site and the craftsmen directly involved in producing copper objects of ritual use. The results of the Polish season corroborate earlier Australian and Dubai Municipality findings, supplying evidence for an analysis of the original landscape in this part of the site. They also contribute new data for an overall reconstruction of site occupation at Sarūq al-Hadīd during the later Iron Age.

Keywords: metal production, furnaces, Iron Age II, beads, re-melting