

IPR XXIII
Vorträge

Bartelheim, Martin and Féaux de la Croix, Jeanne

**Introducing the Guadalquivir to the Jaxartes: on a conceptual date with
RessourceCultures and Eurasian Rivers.**

There are many paths that researchers in the fields of antiquity and contemporary societies have taken in studying water bodies as a basis of social life. In this paper we pursue three goals: firstly, we chart these approaches in the social sciences and outline fields of enquiry that have received less attention. This requires tracing on the one hand, the type of problem - social, material, methodological harboured by particular types of water. On the other, we attend to the politics of science and contemporary social concerns such as climate change that shape research on water bodies.

Further, we examine the usefulness and limits of concepts developed by the SFB 1070 'RessourceCultures' in relation to such large bodies of waters. Our cases encompass archaeological, historical and ethnographic studies of large rivers and their coastal zones in Eurasia. We discuss three propositions in turn: firstly, in what sense such bodies of water can be grasped as a 'resource' that combines material and immaterial aspects. Secondly, we probe the notion of the 'resource-complex' as a way to describe how bodies of water are opened up to human use through a specific combination of knowledge, objects and persons. Lastly, we interrogate the added value of describing societies growing on this basis as 'water societies'.

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Between Sea and Land II: Marine (and Terrestrial) Faunal Resource Use at Tell el-Burak (Lebanon).

Tell el-Burak is located between Sidon and Sarepta in the heart of the Phoenician coast. The zooarchaeological remains from the German-Lebanese excavations at the site provide us with an excellent opportunity to comment on this sea-farer people's maritime resource exploitation with solid data. In this paper, we will discuss the evidence for marine resources use at Tell el-Burak, such as the fish, shellfish and turtle taxa in comparison with our evidence on the use of terrestrial faunal resources.

Living on the coast, what was the relationship of the inhabitants of Tell el-Burak to the resources of the sea at their footstep, especially considering the availability of advanced sea-faring technologies and the incentive for maritime exploration and trade? What was the scale and intensity of marine production at Iron Age Tell-el Burak, in comparison with its neighbors, close and far?

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**Underwater Urban archaeological heritage
A Project for Treviso City (Italy)**

Underwater archaeological heritage can also be into/under our towns. As in the sea, after studying, it can be covered and protected or become a resource for cultural tourism.

In the downtown of Treviso, a city in the northeast of Italy, some years ago, underwater explorations in a channel permitted to find a complex of walls, maybe ruins of medieval mill (XII-XIV AD). During excavation this submerged urban site was perfectly visible from the surface and it became an attractive spot for people asking for more information about it. So the municipality, according with Soprintendenza, decided to study the possibility to keep clean the archaeological area in order to give the opportunity to citizens and tourists to enjoy it.

Now the challenge is to give back this evidence and make it permanently present as an accessible archaeological area: it should become a part of the everyday life of the historic town and a waypoint of a cultural trip through the “water places” of Treviso. Indeed all this town has been shaped by water over the centuries. Rivers and canals have always been used for productive activities and as inside navigation to move people and goods and they still preserve traces of the ancient, long-standing industriousness of the Treviso.

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Dierksmeier, Laura

A Cultural History of Fresh Island Water in Early Modern Spain

The lack of the existential resource of fresh water plagued early modern Spanish island communities. Nevertheless, the burdens of necessity bred creativity in both moments of scarcity (e.g. drought), and excess (e.g. storms and flash floods). This presentation examines specific cases of community cooperation and conflict involving the limited resource of fresh water. Documents from town council meetings, community initiatives, church records, water protection police (alcaldes de agua), and law suits exposes the diverse strategies employed to manage the amount and quality of island water.

Through learned societies, water technologies were introduced to facilitate mills for power production. But advanced technologies were not always superior to local knowledge passed down from generations, such as with sand filtration systems, porous stone desalination techniques, irrigation, and the harvesting of water in its purest form – as snow. The ways in which Spanish island inhabitants managed the limited resource of water reveals not only their ingenuity in moments of distress, but also a distinction between absolute and relative water needs, and the struggle of isolated communities to communicate their needs to those who could help them.

Fantalkin, Alexander

Ashdod-Yam on the Israeli Mediterranean Coast: Ongoing Archaeological Investigation

The first season of excavation at the coastal site of Ashdod-Yam in Israel was reported during the 19th DEGUWA conference.

Two further excavation seasons took place since then, discovering important and significant remains from the Iron Age, the Hellenistic and the Byzantine periods. Likewise, more work has been conducted concerning the identification of the ancient harbours related to the site. In this lecture, I will summarize these advances.

Friedman, Zaraza

The Origin of the Personification and the Attributes of the Rivers of Paradise with Specific Reference to the Rivers of Paradise Depicted in the Mosaic Floor of Church A at Hadrianopoulis, Paphlagonia, Turkey

“And a river went out of Eden to water the garden, and from there it was parted and became into four branches: The name of the first river is Pison: that is it which compasseth the whole land of Havilah, where is gold. The name of the second river is Gihon (Nile): the same is it compasseth the whole land of Cush (Ethiopia). And the name of the third river is Hiddekel (Tigris): that is it which goes toward the east of Assyria. And the fourth river is the Euphrates” (Genesis 2.10-14).

The purpose of this paper is to bring into discussion for the first time the origin and the attributes of the personified Rivers of Paradise depicted in Roman-Byzantine mosaic. Apparently, we may suggest that the personified Rivers of Paradise is associated with the river goddess carrying a jug of water from the royal Palace of Zimrilin at Mari (ca. 2040 – 1870 BCE). The second example comes from a mural in the Temple of Ishtar at Mari, depicting an idealized garden, where the trees are guarded by two river gods. Each god holds a jar with flowing water, symbolically representing four streams flowing from the same source, thus referred to the Biblical Paradise Rivers.

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The personified Rivers of Paradise became a popular motif throughout the centuries, and especially adapted in mosaic pavement decorations, as well as related to varied architectonic structures: the East Church of Theodoria, Cyrenaica; Church A at Hadrianopoulis, Paphlagonia; the Euphrates villa at Zeugma/Belkis; or the God Nile depicted in the mosaic floor of Leontis villa at Beit She'an, Israel.

The present paper will bring into discussion the attributes of the personified Rivers of Paradise and their context within the mosaic theme. The gender of these rivers probably originates from female and male river gods, the symbolism of the flowing waters in Christianity, thus, the Rivers of Paradise also are associated with the four evangelists.

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Palaeoenvironmental evolution of the area between the roman age coastline in front of Ostia and the eastern side of Isola Sacra (Ostia, Italy)

This article presents the results of a stratigraphical study of the territory of Ostia around the mouth of the Tiber during the Roman period. We propose the new archaeological and geoarchaeological researches within a huge programme of Preventive Archaeology promoted by the City of Rome Municipality for the construction of a new bridge on the Tiber (Ponte della Scafa) and its connected road system.

The geoarchaeological analysis and interpretation of the 272 archaeological cores drilled show a different palaeoenvironmental landscape between the territory of Ostia outside the southwest wall of the roman city and the eastern side of Isola Sacra, but with a common denominator: water, from brackish to marine one.

The researches show a larger Tiber bed than the modern one. In 2015 a small tract of an embankment was discovered near Torre Boacciana, a medieval tower built on a roman nucleus identified, by shape and site, with a lighthouse or watch-tower, now distant about 34 meters from the left modern riverside.

In front of the southwestern side of the “Parco Archeologico di Ostia Antica” the geoarchaeological analyses of the cores show, from the bottom to the top a classical marine regression sequence, from a transition to a deep platform silty-clay deposits to beach and fore-dune sands.

In Isola Sacra, where the so-called roman “canal Porto-Ostia” (Salomon et al, 2014) is present, the geoarchaeological analyses of the cores show a lagoon environment used as a navigable link by small boats between Portus and Ostia. Inside this paleoenvironment in the 2011 two shipwrecks were discovered; the vessels wrecked before the first half of the 3rd century AD due to a flood.

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Kamlah, Jens¹ and Orendi, Andrea²**Between Sea and Land I: Coastal Resource Networks at the Phoenician Settlement of Tell el-Burak (Lebanon)**

Tell el-Burak is the center of a German-Lebanese archaeological project which follows the aim to investigate a small coastal settlement in the core of the Phoenician homeland (nowadays Lebanon). The site is located 9 km south of Sidon directly at the coast. Excavations since the year 2001 have revealed the remains of a small settlement (ca. 725-350 BCE) which served as agricultural domain for the nearby central harbor city of Sidon.

Archaeobotanical investigations in the frame of the SFB 1070 have proven that viniculture and olive oil production were the main local resources. However, according to archaeological finds also the Mediterranean Sea was used intensively as a resource. The results of the Tell el-Burak project show, how maritime shipping at the major Phoenician harbor city of Sidon was interconnected with the use of local agricultural resource in the hinterland of the harbor city.

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Loizou, Eugenia

**Bronze Age Harbours in the Aegean
Usage and Exploitation of the Landscape**

This presentation discusses the existence, the infrastructure and the usage of the Bronze Age harbours in the Aegean. Though it is still a matter of debate, whether or not Bronze Age harbours physically existed, there is a plethora of evidence revealing many coastal sites known as “harbour-towns”, installations related to harbours such as shipsheds and theoretical models uncovering possible natural harbours and anchorages in well-protected bays. Moreover, geological investigations in Pylos and comparative studies on Minoan ports on Crete imply technical public works which took advantage of some natural features or altered the natural landscape in favour of economical or military activities.

What is attempted here, is not to present new discoveries related to prehistoric harbours, but to put the archaeological evidence into an environmental frame of study. By studying both the natural characteristics of the landscape of a harbour or port and the environmental transformations a coastal landscape may suffered due to a harbour/port installation, it is anticipated to answer questions about the structures of a harbour, the needs of the maritime community and the ships’ capabilities during the Aegean Bronze Age. In order to approach and interpret the above evidence, iconographical, archaeological and model data are considered and some key-sites as Pylos in Messinia and Kommos in Crete are taken into account as case studies.

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Liphschitz, Nili et al.**The determination of wood species used for construction of the Roman ship found at Trestenik (Gulf of Kastela, Croatia)**

The Roman shipwreck at Trestenik (Gulf of Kastela, Croatia) was discovered at 2006 and excavated during 2012 and 2015. The ship was filled with rocks and scuttled around 200 AD to strengthen the sea wall of a Roman villa near the ancient city of Salona. The ship was built shell first with mortise and tenon plank joinery and frames attached to the shell by wooden pegs from outside-in. The ship was well used before it was scuttled. Frame construction varied throughout the ship. Some frames were floor timber/futtock combinations, alternating with half frames in several positions. The most unique construction feature was the density of the frames and 69 frames were used along the length of only 12 meters. Some frames was so closely spaced that it was difficult to insert a hand between two frames.

Altogether were taken and examined 400 wood samples, including strakes, stringers, sternpost, wales, frames, treenails, tenons, pegs, keel, UMs which were 'floating pieces' and posts.

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The hull of the Kastela was built of 20 different tree species. The keel was made of *Fagus sylvatica*, the stern posts were made of *Fraxinus excelsior*. Most of the treenails were made of *Acer pseudoplatanus* but few of them were of other tree species. All other components were made of various tree species, both conifers and broadleaves. Especially strange is the structure of the futtocks and the fact that each of the examined individual futtocks was made of different tree species. Altogether 13 different tree species were used for the futtocks.

Comparison will be made with other Croatian shipwrecks examined: the Nin boats, the Zaton 2 boat and the Pakostana.

Mainberger, Martin

A neolithic waterscape - archaeological discoveries of the “Beyond Lake Villages” project in the *Westallgäu* region

The archaeological landscapes of Lake Constance and Upper Swabia are famous for their wealth of waterlogged heritage. In contrast, the Westallgäu, which is adjacent to the East, has hitherto remained more or less archaeological terra incognita. This has radically changed with the Beyond Lake Villages (BeLaVi) research project, an internationally designed cooperation of University of Bern (CH), University of Vienna (A), and Landesamt für Denkmalpflege Baden-Württemberg (D). In the area between Eastern Lake Constance and the tributaries of the Danube several Neolithic settlement sites have been newly discovered – permanently submerged below the water tables of small lakes, embedded into peat deposits of moors, but also on hilltop positions. Even more surprising, on-site and off-site data suggest that the time-frame for agricultural activities in the area is much larger than hitherto assumed and covers long periods of the 5th millennium BC.

The respective observations indicate that some of the chronological and economic hypotheses on agricultural landnam in the south-western German pre-alpine forelands cut too short. The post-glacial history of the region has shaped waterscapes rather than landscapes. In such an environment the concept of “cultural landscapes” needs to be complemented by a concept of “limnic” or “aquatic landscapes”. Amongst the multitude of possible uses of water as a resource, in an area crossed by the European Watershed the potential role of traffic is most prominent. The talk presents archaeological and natural scientific data of a project that is based on a long tradition of south-west German archaeological research and now focuses on the understanding of whole regions rather than singular sites.

Negueruela, Iván

The 2016 Archaeological Campaign in the Weck “Nuestra Senora de las Mercedes”. (Atlantic Ocean. Depth: 1.136-1.138 m).

The 2016 campaign has been focused on the mapping of the site and in the recovery of those artifacts that appear expressly cited between the documents of the Mercedes in the Archivo General de Indias (Seville). In particular, we found spoons with the family name “Encinas”, silver plates with the double mark “XX”, or several other objects with the seal of the “Royal Tax”, and, finally, two XVIth century culverins. All of them, expressly cited in the historical documentation.

All these objects (plates of several shapes, spoons and forks of different typologies, a gold pestle with its mortar, two silver candles, a big silver cauldron) has been positioned, excavated, extracted and transferred to the Museum.

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The methodology of working with objects has been the same as in the 2015 campaign:

1. positioning,
2. photographed and filming,
3. meticulous cleaning with water spear,
4. second photographed,
5. extraction.

The main archaeological importance of the 2016 campaign lies in the fact that we have been able to demonstrate the identity of the wreck that the Oddissey company of treasure hunters expelled in 2007 with the frigate Nuestra Senora de las Mercedes, sunk on October 5, 1804 in a pirate attack of the Royal Navy in a period of peace between Spain and England.

Negueruela Martínez, Iván; Recio Sánchez, Patricia; Castillo Belinchón, Rocío; Sierra Méndez, Juan Luis

Deep waters archaeology: The third archaeological campaign in “La Mercedes” shipwreck, August-2017. Depth: 1.138 m.

The National Museum of Underwater Archaeology (Cartagena, Spain) has completed three archaeological campaigns in the wreck “La Mercedes”, since 2015. (For the first campaign, see “Skylis”, 16, 2016, 1: 74 ff). The site dates back to 1804, when the frigate was attacked by an English squadron, and it exploded and sank. The site is at a depth of 1138 meters.

In 2007, the Spanish Government embarked on a legal battle against the treasure-hunters of Odyssey Marine Exploration. In 2012, the US court’s final sentence forced Odyssey to return the cargo to Spain, and the National Museum was designated as its definitive depository.

Then, the scientific battle began. Thereby, we considered that an archaeological research project had to be undertaken. This project had several objectives, including documenting the wreck’s state of conservation after the plunder, making an

archaeological mapping of the site and excavating, documenting and recovering some of the objects that are mentioned in the General Archive of Indies.

This article presents the results of the 2017 campaign carried out with ROV, side scan sonar, multibeam, and sub bottom profiling.

Between other several items, it focuses on the analysis of two large 16th century bronze cannons that were part of the 19th century frigate’s cargo. Both of them were made by the same smelter (Bernardino de Tejada) and they were commissioned by two of the viceroys of Peru: Fernando de Torres y Portugal, Count of Villar, and Luis de Velasco y Castilla.

So, the underwater excavation in very deep waters has helped strongly to the best practice and to the best knowing of those three historical figures with very interesting results.

Key words: Deep waters archaeology. *La Mercedes*. Culverin. Viceroy of Peru. *Bernardino de Tejada*. ROV. Side scan sonar. Multibeam. Subbottom profiling.

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Özdaş, Harun and Kızıldağ, Nilhan

Maritime cultural resources of the northwestern Aegean Sea, Turkey

The Çanakkale coastline (the region of ancient Troas), which connects the Aegean with the Black Sea, is located on an important maritime route that has been used since prehistoric times. Due to intensive maritime activity, this coastal area has great potential in terms of marine cultural heritage. Several prehistoric coastal and island settlements are located on this route, such as Troy, Parion, Lampsacus, Assos, Tenedos, and Imbros. As part of the Shipwreck Inventory Project of Turkey (SHIPT) by Dokuz Eylül University, marine archaeological surveys have been carried out in this region with the aim of exploring and documenting underwater cultural heritage. Side-scan sonar was used to search large areas for shipwrecks, and scuba dives were performed for the visual inspection of findings.

In addition to warship remains, merchant shipwrecks carrying amphoras, rooftiles, and stones dating from Hellenistic to Ottoman Periods have been discovered. A well-preserved shipwreck that had been carrying paving stones were among the finds. This is the first time this type of shipwreck has been documented along the Anatolian coast. Based on radiocarbon analysis, the wreck appears to date to the 18th century. We detected another well-preserved shipwreck of Thasos amphorae dating to the 4th century BCE, which is unique for this region. The shipwrecks that date to World War I also recorded during survey. The results demonstrate the significance of this region for marine cultural resources providing archaeological evidence for the connecting routes between the coastal settlements.

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Oliveri, Francesca and La Rocca, R.**Tales from ancient ships:****Remarks on inscribed and decorated anchor stocks from Sicilian seabeds**

In the ancient Mediterranean world, deities were thought to have control over many aspects of the human world. The offering of votive objects, constituted a regular part of ancient religion in order to appease the divine, but such practice became fundamental in times of anxiety and danger. Seafaring was a dangerous yet necessary activity that likely affected many individuals in the ancient world at one time or another and surely was cause for invoking divine assistance that sometimes did not arrive in time. The seabeds that surround Sicily are full of material remains of that religious activity and their interpretation becomes an important aid in the understanding of past religious behavior and seafarer's traditions.

Maritime votive offerings may include small, portable objects, as well as naval equipment, such as anchors. Anchors found on seabeds likely represented offerings made by sailors seeking protection, dedicated to the divine (especially Aphrodite/Venus in all her marine attributions) by seafarers for a safe passage during navigation, although some inscribed anchors were probably kept on board to use as a extreme salvation solution during a storm. Upon examination of this evidence, it is possible to gain insight into past religious practices and also into the actions and motivations of the people who performed them.

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New Results from Dana Island Ship Yard and recently found Shipwrecks from Cilicia Region

Two archaeological projects related ancient seamanship are carried out in Cilicia Region, modern Mersin and east coast of Antalya on Turkish Mediterranean since 2015. First one is the discovery of an ancient shipyard complex which has about 276 slipways on Dana Island of the Silifke District of Mersin Province in 2015. Second one is the underwater research project resulted with newly discovered 18 ancient shipwrecks in the summer of 2017. Dana Island Shipyard has many different building remains such as at least five churches, a possible temple and watch towers behind of the slipways and a fortification system on the western hill. There are traces which show multiple uses in building remains, located both in the slipways and behind the slipways. Archaeological materials from the surface on the island have been dated between 5th Century BC to 7th Century AD at the research of 2015 and 2016. Bronze and Iron Age anchors also have been found during the underwater research at the coast of the Island in the same years.

The dating of the Island has been revised after the recent survey on island in 2017. The surface materials such as some obsidians, stone tools and potteries were found in 2017 show the possibility of Neolithic, Bronze and Iron Ages. Remains from 2017 research are strongly supported to the presence of Archaic, Hellenistic, Roman and Byzantine periods on the Island. The information obtained gives rise to the thought that the structure of the shipyard here may have been in uninterrupted use from probably Late Bronze Age until the Byzantine periods. Concrete archaeological evidence for the early periods has not yet been found as excavations have not begun on the island.

Palmowski, Valerie

Waters, an omnipresent and constantly used food resource in the Viking age?

Many important sites of the Viking age are located close to the coast, navigable rivers or lakes. Therefore it is not surprising that waters played a central role in Viking life and served as a resource in multiple ways. Certain aspects of the use of this resource can be tracked in the human skeleton. The composition of Nitrogen and Carbon isotopes for example provides information about the diet of a population. Distinguishing maritime and terrestrial diet is a major task in this field of research. Analyses, like they have been conducted in Bornholm (Denmark), Haithabu (Germany) or Ridanäs (Sweden), have shown that the subsistence strategies of communities can change and adapt to extrinsic factors (Gruppe/Carnap-Bornheim/Becker 2013; Cosiba/Tykot/Carlsson 2007; Knudson/O'Donnabhain/Carver/Cleland/Price 2012). It also has been proven that the diet of single individuals or small groups can differ extremely from the sample they belong to.

In 2014, a case study revealed that men in the Norwegian Merovingian Period had a highly variable, terrestrial diet, while women relied on maritime food (Naumann/Price/Richards 2014). In this case the omnipresent and available maritime food resources were not used. Apparently extrinsic – environmental – , sociocultural as well as individual factors have an effect on the (in)voluntary choice of diet. A comparison of isotope analyses (^{13}C , ^{15}N) from human skeletal material of archaeological sites with unique geographical situations – mainland, coast, island – will show how the location of settlements affected subsistence strategies. More osteological data, like e.g. body height, pathological and enthesial changes, serve as indicators for individual and sociocultural factors, which might have influenced the use of maritime food resources. The goal of the project is the establishment of a new view on the use of waters as essential part of the resource complex diet in the Viking age.

Pydyn, Andrzej; Popek, Mateusz; Maciejewski, Jakub

Island of political a spiritual power - archaeological discoveries near a small island of the Lake Łodygowo.

During the project: „Archaeological survey of lakes in the Ilawa Lake District” team from the Department of Underwater Archaeology, from the Nicolaus Copernicus University in Torun checked nine lakes. One of them was the Lake Łodygowo. The area of the lake has a very interesting research history. The first archaeological discoveries in the lake were done in 19th century. In the early 20th century, Prussian researcher La Baume made first recording of the sites on the lake. In 2013, a team of underwater archaeologists discovered two bridges that lead to the Island Kurhany.

One of them was 250 m long and the second was 200 m long. They were constructed and used between 12th and 14th centuries. Spectacular wooden constructions connected a very small island with fortified settlement with opposite shores of the lake. In the area of the Medieval bridges plenty of iron and bronze artefacts, as well as pottery and wild and domesticated animals bones were found. The settlement on the Island Kurhany was located on the Slavonic and Prussian border. It was an unusual settlement, probably it was manifestation of political and spiritual power.

Riehl, Simone^{a, b} and Pustovoytov, Konstantin^{a, c}

Disentangling natural availability from management of water resources in landscapes of the ancient Near East

The availability of water resources is the most important determinant of life, and has always designated collapse or resilience of human societies in the ancient Near East.

As Near Eastern agricultural societies are particularly prone to fluctuations in water availability, the study of Holocene climate dynamics and geoarchaeological records for ancient water management practices have been of wide interest in archaeology. Despite attempts of linking the archaeological evidence to local palaeoclimate data, for example, by applying stable isotope analysis on plant remains from archaeological sites for reconstructing site-specific ancient drought stress in crop species, the role of humans in managing ancient water resources has not been systematically linked to such patterns. Similarly, groundwater often remains a neglected natural resource in archaeological studies in the Near East. The potential role of aquifers in ancient settlement foundations has so far not been related to known climatic features, such as drought stress patterns in archaeobotanical remains.

Here we evaluate the development of climatic trends as recorded in ancient crop plants against the background of the geographic relations between aquifers and archaeological settlements throughout the Early and Middle Bronze Age in the region of northern Mesopotamia and the southern Levant with the aim to better understand the general trends in environmentally related human settlement behavior. In a second step we focus on local exceptions from suggested diachronic and geographic trends, using ethnographic evidence on water management practice in traditional societies and evaluate its explanatory power in addressing the role of human management of water resources in Early and Middle Bronze Age Near Eastern societies.

We expect the results to provide a better understanding of how ancient agricultural societies performed under fluctuating climate and regionally diverse environmental conditions.

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**Water as the trading Route.
Evidence of “Maritime” Commerce on the Garda Lake (Northern Italy)**

In recent years, the Garda Lake underwent different campaigns of research. These have led to the discovery of several interesting sites, particularly of submerged wrecks, which testify of the use of the lake as a privileged communication and trading route not just during the proto-historical and Roman times, but also up to the modern era. Particularly concerning the post-medieval and the contemporary ages, in fact, the traffic of raw materials and of finished products through the lake can be read through the presence of several boats sunk along the western shores of the Garda Lake, in the territory of the Brescia province. Through the study of these sites, made possible thanks to their extraordinary state of preservation, we can understand the political and cultural forces that, above all in medieval and post-medieval era, have contended not only the military control, but also the commercial control of these waters.

Among these wrecks, the recent discovery of a boat sunk near the Garda Island, at a depth of about 55 meters, testifies to the impact of the Venetian domination over the area of the Garda Lake. Since the very first investigations, in fact, the archaeologists have recognized the importance of this wreck not only because of the exceptional preservation of the wooden elements of the hull, but also for the load. The presence of a load of Venetian pottery and the particular structure of the ship have suggested to deeper investigate it by means of a multiannual and multidisciplinary research campaign to be held by the Archaeological Superintendence of Brescia, the Atena Cu.Ma.Na society, the Italian CNR and the Volontari del Garda. In this paper, we intend to present a preliminary analysis of this find and of some objects recovered as samples in order to examine the strong Venetian influence on the communities of the Benacus, even from a cultural point of view, and to better understand how these influences have been locally elaborated.

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Down by the River.

The Embedding of Settlements within the Prehistoric Landscape of Central Spain.

Azután around 5,000 years ago. Massive construction work took place along the middle basin of the Tagus River. A site, which we nowadays describe as double-ditched enclosure, was built in the valley between the Gredos Mountains and the Montes de Toledo. Incorporating the river within the large surrounded space they must have had their reasons for settling on the banks, accepting the accompanied dangers.

Besides possible floodings and the lack of natural defense the location of the El Prado enclosure brought many benefits. First of all, water supply was ensured and fertile soils were abundant in the valley. Both the connecting and the separating part that rivers can play were exploited. On the one hand using the east to west connection along the Tagus leading from the Sierra de Albarracín (Central System) to the Atlantic Ocean. On the other hand the river often canyon-like cuts its way through the Iberian Peninsula and cannot be crossed easily. However, El Prado is situated at one of the few fords enabling the passage from the north to the south.

But water and fertile soil alone cannot be the single explanation for the construction of a double-ditched enclosure with dimensions of at least 50ha. Therefore, the results of the research in the surroundings of Azután will be discussed within the context of Late Iberian Prehistory with focus on the southern Meseta.

Schön, Frerich

Two Faces of Mediterranean Insularity: Connectivity and Isolation as Resources for Island Communities in the Strait of Sicily

Running between Sicily and Tunisia, the Strait of Sicily today is seen as a waterway that connects the eastern and the western Mediterranean basins as well as a maritime frontier that separates the African and the European coasts. The emphasis in connecting or dividing properties of this strait are strongly influenced by cultural evaluations and recent political developments. In other periods of history, the perceptions of the Strait of Sicily were different. This can be demonstrated by focussing on settlement dynamics on the islands in the Strait of Sicily, where periods of increased connectivity with the surrounding coasts and periods of relative isolation are crucial for understanding the islands' histories.

Based on archaeological and historical sources, this paper will give case studies on colonisation processes of insular landscapes in Prehistory, Antiquity and Modern times from the Maltese Archipelago, the Pelagic Islands and Pantelleria Island in a diachronic approach. For this purpose, recent theoretical discussion in the scientific fields of 'Island Studies' and 'Island Archaeology' will be concentrated on the mobility of island communities. The aim is to show, how connectivity and isolation – as two major aspects of insularity – can be seen as major resources for these island communities to understand settlement dynamics in the contexts of the wider central Mediterranean history.

Scholz, Anke

Challenging Conditions – Waters as a central Resource for Supply Systems around Medieval Castles in the Swabian Jura

The Swabian Alb is one of the largest karst landscapes in Central Europe and also one of the regions with the highest number of medieval castles in Germany. The characteristic geomorphology of the escarpment landscape in South-West Germany and especially the steep rocky slope on the north-western margin (the so called Albtrauf) provides excellent conditions for representative hill castles. However, the karst hydrogeology with only little surface water on the plateau and heavy hydromorphic soils in the foreland demand well adapted supply systems which affect the settlement structure.

Using the example of Medieval castles (11th to 15th century a.D.) and their associated domains the interactive relations between diverging spatial requirements and the specificity of the settlement structure will be discussed. Thus, waters and special strategies of water management are central factors for developing and structuring the dominion with corresponding infrastructure facilities for drinking water and water for agricultural and industrial use.

The striking accumulation of castle systems consisting of large castles as political and administrative centres with corresponding smaller castles in the surroundings reflects a certain orientation on waters. That suggests differentiated functions of the castles. In this context the accessibility, protection and control of water are essential resources for the exploitation of further resource complexes, which could have been crucial for the concentration of aristocratic residences in this small region.

Scholz, Roman

Graben, Dokumentieren, Bergen: Digitale Verfahren zur Untersuchung von Schiffswracks

Die Digitalisierung der archäologischen Feldforschung schreitet immer weiter voran und innerhalb von wenigen Jahren haben 3D-Dokumentationsverfahren in die meisten Grabung Einzug gehalten. Mit den neuen Möglichkeiten steigen aber auch die Ansprüche der Öffentlichkeit und der Fachkollegen. Gleichzeitig steigt der Zeitdruck auf Verursachergrabungen. Von dieser Entwicklung sind auch Unterwassergrabungen nicht ausgenommen.

Doch leider sind viele an Land erprobte Verfahren nicht einfach in das Medium Wasser zu übertragen. Schlechte Sichtbedingung, Farbveränderung durch die Spektralfilterung des Wassers, Wellengang und eine aufwendige Logistik erschweren die Arbeit der Forschungstaucher.

Im Rahmen eines Forschungsvorhabens der RGK wurden die Grundlagen für den Einsatz der SFM-Methode an großen Unterwasserobjekten gelegt und im Anschluss bei Grabungen im Baltikum getestet. Dabei konnte selbst bei Sichtweiten um die 40 cm noch erfolgreich eine 3D-Dokumentation durchgeführt werden. Dabei wurden die Vorteile der SFM-Methode konsequent angewandt und auch für die Fundverortung adaptiert. Im Rahmen dieses Vortrags sollen die relevanten Arbeitsschritte einer vollständigen Grabung und Bergung einer Unterwasserfundstelle am Beispiel eines Schiffswracks vorgestellt werden.

Seefeld, Nicolaus

Soziopolitische und ökonomische Bedeutung von Wassermanagement in der klassischen Mayagesellschaft

Eine der zentralen ungeklärten Fragen für das Verständnis der klassischen Mayagesellschaft ist die starke Diskrepanz zwischen einer nachweislich hohen Siedlungsdichte und äußerst knappen Wasserressourcen. Für lange Zeit gab es in der Mayaarchäologie keine präzise Vorstellung von den Anpassungsstrategien, welche die vorspanischen Maya für den Aufbau und das Fortbestehen permanenter Siedlungen im zentralen Tiefland entwickeln mussten. Neueste Forschungen konnten jedoch zeigen, dass die vorspanischen Maya die starke Saisonalität der Niederschläge als zentrales Problem erkannt hatten. Sie verfolgten deshalb den Ansatz, die aufkommenden Wassermassen der Regenzeit zu Sammeln, um ausreichende Wasserspeicher für die kritische Trockenzeit aufzubauen. Während der Frühklassik und Spätklassik bauten die Maya komplexe Wasserversorgungssysteme, die den Fortbestand der Siedlungen sicherstellten. Neben den Einblicken in die technologische Lösung der Wasserversorgung zeigen die mitunter monumentalen Ausmaße dieser hydraulischen Anlagen zudem die massiven Investitionen an Arbeitskräften, die für ihre Konstruktion eingesetzt wurden. Diese geben einem wiederum eine Vorstellung davon, welche zentrale Bedeutung diese Anlagen für die jeweilige Stadt besaßen.

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Für die Stabilität und Funktionalität der klassischen Mayagesellschaft scheinen die hydraulischen Anlagen somit eine weitaus größere Bedeutung gehabt zu haben, als man bisher vermutet hatte.

Der Vortrag wird auf die spezifischen klimatischen und geologischen Ursachen für die saisonale Wasserknappheit im Mayatiefland eingehen und die Entwicklung und technische Funktionsweise der hydraulischen Anlagen beleuchten. Darauf aufbauend soll die soziopolitische Bedeutung dieser Anlagen innerhalb der klassischen Mayagesellschaft herausarbeitet werden. Zudem soll betrachtet werden, aufgrund welcher Ursachen und in welchen technischen und logistischen Aspekten sich die Anpassungsstrategien der klassischen Maya von jenen anderer früher Kulturen unterschieden.

Sossau, Veronika

From axeinos to euxeinos: Pontic Waters as a resource in context of the “Great Greek Colonisation”

The landscape of the Black Sea Region is characterized by the estuaries of several large freshwater rivers forming coastal wetlands and large lagoons. For centuries, the region was famous for its richness in both freshwater and marine fish. Several species including large pelagics fish were known to migrate into the Black Sea in predictable patterns to spawn and feed, leaving it again through the Bosphoros each fall. The coastal marchlands were also rich in salt and – once cultivated – fertile land. Apart from that, the rivers offer a connection to networks reaching far into the Northern steppe. Still, Archaic literary sources describe life in the Pontic apoikai as hard and dangerous, the area and its inhabitants as hostile.

Despite many years of research on colonisation, the motivation for Greek, mainly Ionian settlers, above all Milesians, to sail towards the Black Sea and found apoikiai (homes away from home) both at the coasts of the Bosphoros and along the shores of the Black Sea still remain unclear – just as the exact process and nature of the migration processed summed up under the term “Great Greek Colonisation”. This paper aims to deal with several dynamics underlying this phenomenon and systematically explore the manifold role Pontic waters play as a resource in the framework of that phenomenon. ‘Resources’ are hereby not equated with “raw materials”, but understood in an extended sense including their social dimensions.

Stefanile, Michele

Aquatio: some considerations on the use of freshwater in the Roman sea fishponds

The ancient fishponds, that were often built in close connection with the Roman maritime villas, especially during the Late Republican and Early Imperial Ages, are complex systems for the aquaculture, carefully designed to control water salinity, oxygenation and temperature, in order to guarantee the process of fish farming. The ancient authors are very accurate in the description of these type of structures, often offering to the archaeological research useful keys for the interpretation of findings.

In this paper, we examine in detail the so-called aquatio (mentioned by Cicero in *De officiis*, III, 59), i.e. the mixing of freshwater with the salt sea water for the attraction and the good breeding of fishes, especially on the basis of the new data and observations achieved during the Southern Latium Underwater Survey in the maritime villas of Gianola, Gaeta, Formia, Sperlonga (Latium, Italy) and in the Picenum Survey in the vivarium of Pietralacroce (Marche, Italy).

The need for freshwater, actually, induced the Roman architects to build their fishponds close to springs and streams, whose waters were channeled and used in the system; the presence of freshwater streams, in some cases still active in the present time, can explain the choice of certain sites and places and the exclusion of others.

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Taghizadeh-Mehrjardi, Ruhollah

Water management system in Qanat: an example from Yazd, Iran

Yazd city is located in the central plateau of Iran. This city is characterized by a warm and dry climate with a low relative humidity and an average annual precipitation 80 mm. Although there are water shortage problems, this city is the second most important region for pistachio cultivation in Iran. This is because of an amazing irrigation system in the area called “Qanat”.

This technology was known in Iran by the sixth century BC and is a gently sloping underground channel to transport water from an aquifer to a surface mostly located at a lower level for irrigation and drinking. It is worth noting, qanats are the most compatible system of water supply in arid and semi-arid regions.

Tal, Oren

Coastal Wells as Past Sea-Level Indicators: A Test-Case from Israel

Very few, if any, sea-level studies outside of Israel use coastal wells as relative sea level indicators for the reconstruction of Israel's sea level in the past 2,500 years. In our talk, we will present re-evaluation of previous records and add new data to the relative sea level, based on a series of excavations and examinations of coastal wells we have performed in recent years. We will also present different methods for obtaining the most accurate modern offset between coastal groundwater level and mean sea level, and advocate in favor of a hydrological model where groundwater elevation is a function of distance from the modern coastline. Our functional age range for the coastal wells is based on site stratigraphy, artefacts, historical records, and the coastal water well typology. These archaeological indicators rely on finding the vertical offset between present-day coastal groundwater and sea level, and applying it to ancient times.

Our results show that sea level in Roman times (1st century CE) was almost similar to present-day, slightly higher in the Byzantine period (4th to 7th centuries CE), and lower in part of the Early Islamic period (9th to 10th centuries CE). For the later Fatimid/Ayyubid and Crusader periods (11th to 13th centuries CE), RSL reaches its lowest elevations (of about -0.5 m) as previously found. Following these low levels, sea level rose going into the 18th and 19th centuries.

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Tiboni, Francesco

Living by the Lake – The Garda Lake: A small sea

Since prehistory, the Lake of Garda, Northern Italy, has been inhabited by several human groups, which have found good places to live around its shores as well as on the mountains surrounding the waters. Starting at least from the 19th century, a great number of witnesses of this long-lasting human occupation has been discovered and investigated, mainly thanks to some important scholars who have spent their lives working in the area. Up to now the lake still represents a very interesting case-of-study to understand the development of the long relationship between man and water, particularly from the proto-historical and up to the Roman era.

But while on the one hand the researches along the lakeshores of the Garda appear to be extremely developed, concerning its underwater dimension less has been done. Despite preserving the richest amount of Bronze Age Pile Dwelling sites of the entire Italy, the Garda waters have been investigated only few times, without a proper strategy, and we still lack of a good knowledge of how the prehistorical and historical settlements evolved during the years.

In recent time, the possibility to start a close cooperation among the local Superintendences of Brescia and the Superintendence of Trento, the ATENA CuMaNa society, the Italian Council for National Research, the Volontari del Garda Civil Protection Group, and some universities from northern Italy, has allowed us to increase the number of discoveries as well as to check the actual state of affairs for different sites. This has permitted us to achieve many new information about how men and waters interact during the millennia.

In this paper, I will discuss how the men have lived on the lakeshore of the Garda Lake, in the Western and North-Western area of the basin, from prehistory up to the twentieth century. To do this, I will present a new version of the map of the known sites dating from prehistory to the modern era, as updated in the last years thanks to the new instrumental researches held. As we will see, it takes into account all the prehistoric pile dwelling sites, the roman villas, the medieval castles, as well as many of the ports and infrastructures dating from prehistory to modern era lying underwater. Particularly for the harbours, I will present the site of Camping La Ca in Padenghe sul Garda (BS), a site where some previously unpublished works have permitted to achieve important information about the use of this area in pre-Roman and Roman era. Further, I will present some recent discoveries of wrecks and submerged sites, not known before, which has allowed us to increase our knowledge about the lake and its history.

Francesco Tiboni – NavLab – University of Genova
ATENA CuMaNa – University of Genova

Tusa, Sebastiano

A submerged Roman pier in Lipari (Aeolian Islands, Sicily)

The Lipari island belongs to the Aeolian archipelago, located in the Southern Tyrrhenian Sea (Italy), which is one of the most active volcanic areas of the Mediterranean basin. Although this region has been settled since prehistory, only during Roman times were built coastal installations in these islands. In this study we show and discuss data on the relative sea level change estimated from a 140x60 m of size submerged pier of Roman age located along the coast of Marina Lunga, that correspond to the present location of the main harbor of Lipari island. This structure, which has been discovered in 2008 during preliminary excavations for the construction of a

11.6±0.05 m. We studied this site through direct investigations and ultra-high resolution multibeam bathymetry. Archaeological interpretations address the age of this structure at 2100±100 years BP.

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Roberto La Rocca

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The current submergence of this pier can be explained by the cumulative effect of the relative sea level changes caused by the regional glacio-hydro-isostatic signal, active since the end of the last glacial maximum, and the local volcano-tectonic land subsidence. From our investigations, a relative sea level change between 11.6±0.2 and 13±0.2 m with a subsidence rate between 5.17 and 6.12±0.01 mm/yr⁻¹ and a volcano-tectonic contribution of 5.10 and 6.06±0.01m/yr⁻¹ for the last 2100±100 years BP, is estimated from the comparison against the latest predicted sea level model for the Southern Tyrrhenian Sea. These rates of relative sea level change, led to the disuse of the harbor between the second and the third century AD, in agreement with archaeological data. Our results provide new insights on the recent evolution of this active volcanic area.

Verdonkschot, Jadranka

Interpreting Neolithic Thoughts by the Lakeside A Theoretical, Interdisciplinary and International Approach to the Question *Why* People Settled Lacustrine Environments in Neolithic Europe.

Why would people settle wetland environments in Neolithic Europe? The answer to this question is sought for in the assessment of four archaeological case studies (Egolzwil 3, Switzerland; Hörnle IA, Germany; La Draga, Spain and Dispilio, Greece) and two anthropological examples of pile dwellings (the Ribeirinhos, Amazon and Amsterdam, the Netherlands). The exploitation of resources, the relationship of the lake-dwellers with the landscape and ritual evidences are all taken into account in order to make observations regarding the reasons the first people to settle on lakeshores in distinct regions could have had, the influence of the lake on their life and identity and a broader assessment of culture and identity as a „liquid“ concept. This line of research was inspired by the observation that any explanations for initial wetland settling in prehistoric archaeology are overly simplified.

Existing tendencies rely on environmentally deterministic and exclusively practical arguments. Aspects such as the agency of the landscape or nuanced views regarding identity are generally absent. This study aims to change this and implement and assess the use of theoretical considerations such as symmetrical archaeology, following the ontological turn and the possibilities of interdisciplinary research. Moreover, as several regions are represented this study is the first of its kind in assessing such a broad and diverse lakeside settling panorama. This work does not pretend to reach a definitive answer, a single reason explaining the settling of the lakeshore, but is rather a theory-based exercise that moves beyond conceptual and modern borders.

Vossler-Wolf, Christina

Aqua viva and the monk in the pond – multi-dimensional water use in medieval monasteries

For medieval monasteries there was a great importance of water, it served both as material and immaterial resource. On the one hand water had a important meaning for salvation through many different liturgical rituals. On the other hand monasteries developed a very efficient water system with ponds and streams to improve their economy.

The talk wants to show how waters were used as material and immaterial resource to establish and preserve medieval monastic societies. The examples are located in Southwest Germany. The research is first dealing especially with monuments such as buildings or changes in the landscape and analyses the influence of monasteries on the environment by the use of waters. It is to prove how water use established social and economic structures in a spacial dimension and how it is still preserved in our modern landscape.

Second there ist to ask how these medieval remains of waters are seen today. Is the former symbolic meaning still in mind? Are they part of a monastic identity or historical authenticity which is still connected with the monastic building itself? Are they realised and protected as cultural heritage? The multi-dimensional water use in medieval monasteries is seen as well in a spatial as in a diachronical perspective as a very complexe system which shows us cultural dynamics in a social context.

Wintjes, Jorit

A harbour fit for an ironclad fleet – the creation of the world’s greatest artificial harbour in the 19th c.

As the Royal Navy rapidly turned from a Navy of wood and sails into one of iron and steam, demands on the base infrastructure supporting the navy not only greatly increased but also changed considerably in character, with coal rapidly becoming an all-important item without which sustained naval operations were hardly possible. As a result, the second half of the 19th c. brought about for the Royal Navy not only the so-called ironclad revolution but also a massive increase in shore facilities all around the world, ranging from small coaling facilities on far-flung foreign stations to Royal Dockyards capable of providing every kind of support right up to the construction of warships.

During the decades from 1844/45 onwards the waters between the coast and the Isle of Portland, which had already been in use as a sheltered anchorage since antiquity, were turned into what was at the time the world's largest artificial harbour. Easily the most spectacular element of this harbour was a series of large breakwaters, the first pair of which was finished only in 1872; in addition, harbour defences and base infrastructure buildings were erected. The base served the Royal Navy for over a century until it was finally closed in 1995. The paper will focus on the initial construction of the southern breakwaters of Portland harbour and the defences of the breakwaters themselves, both of which have so far seen fairly little scholarly interest.

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Buss, Holger

Gezeitentaucher - Wracktauchen in der Nordsee

Seit 2007 taucht eine Gruppe von acht Sporttauchern in der Nordsee, sie nennt sich "Die Gezeitentaucher". Die Nordsee ist eines der wrackreichsten Gewässer weltweit. Die schwierigen Bedingungen dieses Reviers sind der Grund, weshalb die meisten Wracks in der Nordsee weitestgehend unerforscht sind. Typische Ziele sind Stahlwracks vor den Ostfriesischen Inseln. Einige der Wracks sind bekannt, viele noch unbekannt.

Ein in Norddeich Hafen liegendes Rib mit festem Rumpf dient als Transportmittel. Es sind GPS, Echolot und Sidescan Sonar an Bord. Zu den interessantesten Wracks gehören Schiffe aus oder vor dem Zweiten Weltkrieg. So finden sich zum Beispiel sowohl Frachtschiffe als auch Kriegsschiffe am Meeresgrund. Die Gruppe finanziert sich ohne fremde Mittel. Sie hält sich an die Vorgaben des niedersächsischen Denkmalschutzgesetzes und dokumentiert die Wracks, ohne Funde zu bergen.

Das Rätsel um Wrack X

2017 konnten die Gezeitentaucher endlich das Rätsel um ihr "Wrack X" lüften, das sie bereits im Jahre 2007 per Echolot entdeckt hatten. Diverse Recherchen hatten ergeben, dass das Wrack bislang noch nicht identifiziert war. Es handelt sich um ein genietetes Stahlschiff mit 61m Länge in ca. 27m Wassertiefe auf dem sandigen Meeresboden vor Norderney.

Im Jahr 2017 absolvierte die Gruppe Spezialkurse in Unterwasserarchäologie vom VDST in Rostock bei Henrik Pohl und Martin Siegel und bei Dr. Florian Huber in Emden.

www.gezeitentaucher.de

Diese Methoden der Vermessung, 3D-Modellierung und Dokumentation wurden anschließend bei mehreren Tauchgängen im September 2017 auf das "Wrack X" angewandt.

So konnte eine Phantomzeichnung des Schiffs angefertigt werden. Dann begann eine umfangreiche Recherche. Es wurden hunderte Zeitungen aus dem Zeitraum zwischen 1900 und 1950 gesichtet und zahlreiche Schiffsuntergänge in der Nordsee untersucht. Von den infrage kommenden Schiffen mussten Zeichnungen, Fotos oder weitere Daten aufgetrieben werden. Alle wurden mit der Phantomzeichnung von "Wrack X" verglichen. Im Oktober 2017 gelang dann endlich die erfolgreiche Identifizierung. Es handelte sich um den 1917 gebauten Dampfer "Elsa" von Kapitän Ernst Weitendorf aus Rostock, der am 1. Dezember 1936 mit einer Ladung Kohle vor Norderney in einen Orkan geraten und gesunken war.

In einem ausführlichen Prospektionsbericht ist das Wrack genau dokumentiert und die Herangehensweise zur Identifizierung beschrieben. Außerdem konnten die Gezeitentaucher Kontakt mit dem noch lebenden Enkel Weitendorfs aufnehmen, der noch in Besitz wichtiger Dokumente ist. So gibt es z.B. einen Augenzeugenbericht von Überlebenden des Unglücks und ein Ölgemälde im Rostocker Schifffahrtsmuseum.

Im Januar 2018 erschien ihr Buch: "Die Gezeitentaucher: Wracktauchen in der Nordsee".

Dreyer, Boris**Nachbau des Oberstimmer Wrack II**

Gerne stelle ich Ihnen unseren Nachbau des Oberstimmer Wrack II vor sowie das begleitende wissenschaftliche Programm und die Tests, die wir dann (im Mai 2018) gerade starten. Derzeit (und zwar konzentriert seit dem Ende April 2017) bauen wir an dem Boot nach dem Vorgaben des Wracks II von Oberstimm. Wir halten uns an das benutzte Material und die römisch-mediterrane Bauart (der Nut- und Federverbindung). Eine detaillierte Dokumentation zum Projekt, an dem Studierende, Schüler und Interessierte unter der Anleitung von erfahrenen Bootsbauern arbeiten, erhalten Sie auf der Homepage www.egea-ev.de. Wissenschaftliche Vorträge von Fachleuten und ein Team von erfahrenen Kollegen im antiken Bootsbau begleiten das Projekt.

Wir profitieren von Vorgängerprojekten, deren Leiter uns mit Rat und Tat unterstützen. Begleitende wissenschaftliche Vorhaben (Untersuchung der Holzproben von Oberstimm) sollen unser Wissen über die Oberstimmer Wracks, die einen Jahrhundertfund darstellen und ihresgleichen suchen, voranbringen.

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Esposito, Renata

Public and private Roman water reserves in the Phlegrean Fields

The Gulf of Naples played a decisive strategic role for the Roman commercial and military interests, at the same time it was also the favorite place for *otium* of the rich patricians. Particularly along the coasts of the Phlegrean Fields, since the late Republican age, impressive and luxurious villas were built on the coast. Thanks to the interest of Rome for these places under the reign of Augustus, there were also structures linked to the commercial port of *Puteoli* and the military port of *Misenum*.

This articulated network of public infrastructures and private residences needed a consistent water supply to manage everyday life. The system was based on massive coated cisterns, whose structural complexity is attributable to at least 5 architectural typologies (es. *Piscina Cardito*, *Cento Camerelle* etc.).

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In the Augustan era, as part of the imperial program of major works, the Serino aqueduct was built. From the Avellino territory across the Campania, along a 96 km journey, it supplied many cities and villas, ending in Miseno where it supplied the military fleet with water. The infrastructure ended in the largest water tank in the area the *Piscina Mirabilis*.

Gerasimov, Vyacheslav

Underwater Archaeological Research in the area of Tendra Spit and the Berezan Island (Ukraine) in 2017

In the season 2017, the Institute of Archeology NAS of Ukraine Kiev, Ukraine (V. Gerasimov, R. Reyda), organized a joint Black Sea International underwater archaeological expedition with Center for Research on the Antiquity of Southeast Europe of Institute of History, University of Warsaw (V. Gerasimov), Department of underwater archeology Institute of Archeology University of Warsaw (A. Brzoska). With the participation of students of the “Wod.o.Lot” scientific circle and students of postgraduate studies in underwater archeology of the University of Warsaw. In the work of the expedition, took part members of the Warsaw Club of Divers.

Was carried Interdisciplinary, underwater non-destructive archaeological research in the waters of the Tendra Spit and the Berezan' Island out. The Exploration of the place of the newly discovered in 2016 Shipwreck from the Roman period, in the Tendrovski Gulf, on the north-western tip of the Tendra Spit and Research in basin of Berezan' Island in the Black Sea basin in the region of Kherson and Mykolaiv of Ukraine.

Center for Research on the European Antiquity of the Southeast Institute of History at the University of Warsaw, Roman Reida

Institute of Archeology of the National Academy of Sciences of Ukraine, Kiev, Artur Brzoska

Department of underwater archeology, Institute of Archeology, University of Warsaw

The Research was undertaken for creating of maps of underwater archaeological sites and a collection of archaeological material for technical and typological analysis. The research was carried as part of the planned topic of IA NASU: “Archaeological Culture of the Ancient and Medieval Black Sea, Periodization and Chronology.”

In the summer season of 2017, underwater archaeological research was carried out mainly in the sea basin at the Northern Cape, at the end of the Tendra Spit, both from the Tendrovski Gulf and from the seaside. In addition to the visual prospects (divers in groups of two man conducted research using the streak-seeking method), was used the non-destructive method of Exploration of the Sea bottom of the area. For this purpose were used the Echo sounder “Echo scan 8”, Side Scan Sonar “Lawrence HDS 7 Carbon”, “Structure Scan 3D” and the computer program “Reef Master Sonar Viewer”. Similar prospects took place in the Basin of Berezan' Island.

Peukert, Detlef¹; Haarstark, Harry; Knepel, Gerd; Reitz, Jürgen

Eine römische Brücke über den Main in Frankfurt zwischen Griesheim und Schwanheim? Ergebnisse der Unterwasser-Prospektion der Jahre 2016-2017

In den Jahren 2016 und 2017 haben Taucher der BGfU (Detlef Peukert und Jürgen Reitz sowie Gerd Knepel, als Archäologischer Forschungstaucher und Taucheinsatzleiter, Verantwortlicher für Unterwasserarchäologie im VDST und der CMAS) in Kooperation mit dem Geschichtsverein Griesheim e. V. im Uferbereich des Mains auf dem Gelände der Infrasite Griesheim GmbH in mehreren archäologischen Tauchgängen nach Überresten einer Römerbrücke zwischen Schwanheim und Griesheim gesucht.^{2,3} Ziel war es, Überreste einer römischen Brücke zu finden, diese genau zu lokalisieren und den Zustand zu dokumentieren. Diese Brücke als Flussübergang war von Archäologen, die das Straßensystem der Römer erforscht hatten, an dieser Stelle schon länger vermutet worden. Die unterwasserarchäologische Untersuchung war mit dem Denkmalamt der Stadt Frankfurt abgestimmt. Die fachliche Begleitung erfolgte durch die Amtsleiterin Frau Dr. Andrea Hampel.

Eine römische Brücke als Flussübergang war von Archäologen, die das Straßensystem der Römer erforscht hatten, an dieser Stelle schon länger vermutet worden. Mittels alter Pläne und Karten, aber auch nach historischen Berichten, wurde die Stelle am Schwanheimer Ufer lokalisiert und ein Suchbereich am Griesheimer Ufer eingegrenzt.

Die Taucher des BGfU-Teams stießen am nördlichen Ufer in drei Metern Tiefe auf die

hölzernen Überreste zweier rechtwinklig zulaufender Pfahlreihen, deren längerer Schenkel als Teil einer Rahmenkonstruktion aus Spalthölzern parallel zur Uferlinie verlief. Es handelt sich vermutlich um die Reste der Basis eines historischen Brückenpfeilers.

In einer Tiefe von ca. 3 m wurde an der Grenze zur Fahrrinne eine ca. 1,60 m hohe Palisadenwand gefunden, die tal- und bergseitig eine Schmalseite aufwies, die gegen das abfallende Ufer auslief. Innerhalb der Palisadenwand fand sich ein fester Zementboden der mit Natursteinen gebaut war. Im Zementboden waren drei Anker aus Eichenstämmen eingelassen.

Holzproben eines gespaltenen Viertelstamms einer Weißtanne wurden entnommen und zur dendrologischen Datierung ans Labor des Curt-Engelhorn-Zentrums Archäometrie gGmbH nach Mannheim an Dr. Westphal geschickt. Leider datierten die Proben aufgrund zu geringer Jahresringe nicht.

In einigen Metern nordwestwärts konnte eine weitere ca. 8 m lange Palisade beobachtet werden, die an ihrer NW-Seite ebenfalls eine Schmalseite von 4 m aufwies. Die Oberfläche wies eine Neigung von 3 m im SO bis zu 4 m Tiefe im NW auf. Möglicherweise handelt es sich dabei um eine Pieranlage. Die Untersuchungen werden 2018 fortgesetzt.

- 1 Projektorganisaton, Poster, Präsentation; Bayerische Gesellschaft für Unterwasserarchäologie BGfU
- 2 BGfU und Geschichtsverein Griesheim e.V. danken:
 - der Deutschen Lebens-Rettungs-Gesellschaft Bezirk Frankfurt e.V. mit dem Mehrzweckrettungsboot „Thaddäus Bell“ und dem Bootsführer Sven Kleinschmidt inklusive Besatzung, die die Absicherung der Taucher gegen die Fahrrinne übernahm,
 - Infrasite Griesheim GmbH und Werksfeuerwehr die den Zugang ermöglichten,
 - die Wasserschutzpolizei sowie das Wasser- und Schifffahrtsamt Aschaffenburg ABZ Frankfurt.
- 3 vgl. Jahresbericht der BGfU 2016

Peukert, Detlef; Haarstark, Harry; Knepel, Gerd; Reitz, Jürgen

A Roman bridge across the River Main in Frankfurt between Griesheim and Schwanheim? Results of an underwater survey 2016-2017

In the years 2016 and 2017, divers of the BGfU (Detlef Peukert and Jürgen Reitz as well as Gerd Knepel, as archaeological research divers) did an underwater survey in co-operation with the Historical Society Griesheim e.V. within the bank range of the River Main on the area of the Infrasite Griesheim GmbH. The pursued goal of the BGfU-Team was to find remnants of a Roman bridge between Schwanheim and Griesheim, to locate these exactly and document their position.

The underwater archaeological investigation was co-ordinated with the office for monuments of the city Frankfurt/Main. The scientific supervision was done by the office chief Mrs. Dr. Andrea Hampel.

This bridge as a river crossing had been assumed by archaeologists since a longer time during their investigation of the Roman road system around NIDA. By means of old plans and cards, in addition, after historical reports, the site at the riverbank of Schwanheim bank was located and a range for a survey at this site was limited. At the northern bank three meters deep the divers of the BGfU-Team encountered wooden remnants of two orthogonally approaching stake rows. Its longer side was part of a frame construction like a caisson. It ran parallel to the bankline. It probably concerns to the remains of the basis of a historical pillar of a bridge.

In a depth of approx. 3 m near the border to the navigation channel and c. 25 m far from the northern riverbank it was found an approx. to 1.60 m high stockade wall. The palisade wall exhibited on its river upward as well downward side a shorter wall which ran against the sloping bank. Within the stockade wall a firm cement ground was found built by natural stones. In the cement ground three anchors from oak trunks were admitted.

Wood samples of a quarterly split trunk of a silver fir were taken and sent for dendrochronological dating to the laboratory of the Curt Engelhorn center archaeometry gGmbH Mannheim to Dr. Westphal. Unfortunately the samples did not date due to too small number of yearly rings.

Some meters northwestwards a further approx. 8 m long and 4 m wide stockade could be observed. The surface showed an inclination of 3 m in SO down to 4 m depth in size. Possibly this construction concerns to a jetty plant. The investigations will be continued in 2018.

Detlef Peukert, Harry Haarstark, Gerd Knepel und Jürgen Reitz

Pflederer, T.; Fiederling, M.; Neubauer, D.; Peukert, D.; Knepel, G.; Tusa, S.; Oliveri, F.

Underwaterarchaeological Report on Mozia / Sicily 2017

In 2017, the Soprintendenza del Mare (Palermo), the Bavarian Society for Underwaterarchaeology (BGfU) and the Philipps University Marburg carried out underwaterarchaeological surveys around the island of Mozia in the Stagnone Lagoon of Marsala in the western part of Sicily. Mozia is known for its undisturbed Phoenician archaeological remains. The investigations led to partial clarifications of the Phoenician causeway and the area south of the so-called „Kothon“. Most suprisingly was the discovery of a late Roman finding spot in front of the island's eastern shore.

Among the finds, there are many rim and spike fragments as well as handles from different late Roman types, mostly north african. Besides, pantellerian ware dating between the 4th and 5th century AD also a 5.5 kg heavy fragment of a Roman lead anchor could be documented. Along with

with several wooden piles, the interpretation of a late Roman anchorage place seems possible and will be further investigated in the next years.

Sorokin, P. E. and Gusentsova, T. M.

The Neolithic wooden defenses of the Neva River

The Neolithic sites Okhta 1 is first archaeological object with gut preserved wooden construction in St. Petersburg region. The territory of sites have been occupied by ancient people several times during the Neolithic Age – in the Early Metal Age periods – from 7000 to 3000 years ago. The archaeological collection includes among archaeological finds: pottery, stone tools, products of organic matter, amber jewelry, the remains of wooden structures – stakes, treated wooden slats and rails, and piles. Features of the micro landscape of the site, its stratigraphy and archaeological observations allowed us to select an earlier coastal fishing zone located on the coast of the paleolagoon, and fishing defenses, connected to river channels.