Session title: **CITIES AND PORT SYSTEMS: FROM ANTIQUITY TO THE MIDDLE AGES**

Organizers: Timothy Gambin, Department of Classics and Archaeology, University of Malta
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Irena Radić Rossi, Department of Underwater Archaeology, Croatia.

Time: Thursday afternoon

Room:

Session abstract:

The academic gathering on Cities and Port Systems aims to further develop our knowledge of synergies that existed between ports and cities, the former as liminal places where seaborne goods arrived and the latter as centres of production, consumption and redistribution.

There has been a recent surge of studies on various facets of the archaeology of ports. Topographic and geomorphological studies of various ports around the Mediterranean, Atlantic, North, Baltic and Black Seas have brought to light significant environmental and landscape changes that have proved vital to a better understanding of more traditional facets of the archaeology of ports. Results of geoarchaeological studies are now bringing about a re-evaluation of specialized structures such as quays, warehouses and moles. One may also link evolving coastal landscapes to change or continuity in towns built around ports. Furthermore, one may also review the context of shipwrecks found on the approaches to harbours. This session will also seek to bridge the artificial boundaries that sometimes arise between archaeologists working at sea and those working on coastal sites such as port cities.

The first aim of this session is to bring together various archaeologists who have been working in the field so as to increase awareness on the diversity of ongoing projects that have ports as their main field of study. The second aim is to explore the various methodologies used in the field including remote sensing, underwater archaeology, coring and GIS driven technologies. Finally, the third aim is to promote new research in the field of ports and their cities so as to better understand the significance and influence of the sea on how people, goods and ideas travelled.

The 14th Annual General meeting of the European Association of Archaeologists provides the ideal platform for the hosting of this session. Results from current projects carried out in and around ports and port cities in the Mediterranean, North, Baltic and Black Seas as well as inland waterways can be disseminated to the EAA audience.

Paper abstracts:

PRELIMINARY CONSIDERATIONS ON THE ANCIENT PORT OF PAKOŠTANE (CROATIA) BASED ON ARCHAEOLOGICAL AND GEOMORPHOLOGIC RESEARCH

Irena Radić Rossi, Depatmant of Underwatr Archaeology, Croatia
Fabrizio Antonioli, ENEA, Italy

Pakoštane is a modern tourist destination on the Dalmatian coast near the urban centre of Zadar. Its history should be considered within the context of the whole region, comprising the nearby Lake Vrana to the east and the Pašman Channel towards the northwest.

Before the Roman conquest, the region was home to the Liburnians. Traces of important Iron Age fortified settlements have been discovered around the lake and it is presumed that ancient Blandona, an important Liburnian centre known from the historical record, was situated nearby. Already in that period the naturally protected and easily accessible port of Pakoštane could have provided suitable communication with the sea.

The necessity for well planned seafaring through the Pašman Channel in antiquity influenced the development of the port of Pakoštane as an important point from where to observe the weather conditions and continue navigation towards the north. Some archaeological evidence for the existence of Roman saltpans makes us reflect upon another possible important role of the ancient port.

Geomorphological measurments, aimed to establish the relative sea-level change during past four millennia, have been realized during the 2008 excavation campaign. Sea-level change is the sum of eustatic, isostatic, and tectonic factors. The first is global and time-dependent, while the latter two vary with location. The northeast Adriatic (Italy, Slovenia and Croatia) is an area of tectonic subsidence and we use the calibrated model results to distinguish changes caused by isostatic and tectonic factors.

In the NE Adriatic (Venetian Plain, Trieste gulf and Istria) the isostatic component of post-glacial sea-level rise has been recently predicted and compared with field data at several archaeological coastal sites and thus a frame for calculating vertical tectonic motions is available. In this paper we provide new data on relative sea-level change during the late Holocene in northern Dalmatia. They are based on precise measures of submerged archaeological and geomorphologic markers that are good indicators of past sea-level elevation.

The measurments indicate a Roman age palaeolevel of about -2.1 m. During Roman times, the average palaeo level should be about -1 m, indicating that at Pakostane, the Adriatic coast has tectonically subsided by 1.1 m since Roman times (less than northern Istria). The age of the beach-rock will provide the timing of sea level change at about -5 m. We hypothesize that the small islands that are today near Pakostane were a unique palaeo coastline.

The results achieved in this work refine and supplement the Lambeck et al. (2004) investigation of the relative sea-level changes in the Adriatic Sea. In particular, we are now able to provide a comprehensive picture of the relative sea-level history at one southern Adriatic site, significantly affected by tectonic displacements. The implemented database is of timely importance in the light of relevant flooding risk quoted by the 2007 IPCC report for the Mediterranean Sea. Therefore, any future planning regarding the Croatian coastal area during next century is compelled to rely on detailed estimation of relative sea level changes. Hold collaboration between

archaeologists and geologists, as happened in this case, hands good results in both fields of research.

COASTAL AND ANCIENT HARBOUR GEOARCHAEOLOGY IN THE MEDITERRANEAN

Nick Marriner, CNRS Provence, France
Timothy Gambin, University of Malta
Cristophe Morhange, CNRS, Provence, France

Maritime archaeology is today a heavily interdisciplinary field of inquiry, lying at the interface between, not just archaeology, but also history, geography, the geosciences and marine biology, at a plethora of spatial and temporal scales. Since the early 1990s, coastal and ancient harbour sediments have been shown to be rich time-series of human impacts yielding insights into the magnitude, variability and direction of changes since the Neolithic. Through a number of examples from the eastern and western Mediterranean, this paper presents research advances made during the past decade in the field of coastal geoarchaeology, focusing on four principal themes. (1) The location and characterisation of ancient Mediterranean harbours. The development of a number of large urban excavations, such as Beirut, Marseille and Naples, means that sediment archives have become important facets of modern archaeological investigation, and complimentary to more traditional techniques. (2) The mobility of Holocene coastal environments and human impacts, including natural hazards and the ways in which human societies have exploited coastal geomorphology since the Neolithic. (3) Watershed geoarchaeology and regional source to sink sediment transfers. (4) Conservation and valorisation of coastal heritage in the Mediterranean.

RE-WRITING DARK AGE ECONOMICS: EMPORIA, ARCHAEOLOGY, AND METAL-DETECTORS IN EARLY MEDIEVAL NORTHERN EUROPE

John Naylor, Portable Antiquities Scheme/Ashmolean Museum, UK

The early medieval emporia of north-west Europe, e.g. Southampton (England), Dorestad (Netherlands) and Quentovic (France), represent the early beginnings of medieval urbanism and defined port structures, and the flowering of a North Sea-based exchange system from c.AD650-850. Excavations have shown strong evidence for both regional and international trade in a wide range of goods, with bulk production another important function. It is likely that they were under the aegis of local kings who protected and regulated trade, collecting tolls and probably guaranteeing themselves first choice of goods. However, their effect upon, and relationship with, the surrounding coastal zone remains poorly understood, as does their role in broader trade and exchange. Using mostly English evidence, this paper will draw on the wealth of new data provided by portable antiquities (stray finds of artefacts and coinage) to assess changes outside of these ports through time, combined with archaeological evidence from the ports themselves to explore how their internal development may have affected the coastal zone. This will show how

the emporia dominated their coastal zones, and appear to have restricted other, local economic activity along the coast but may have facilitated a freelance exchange economy at a greater distance procuring materials up and down the coast.

ROMAN LANDING PLACES AND HARBOURS IN BAVARIA, GERMANY

Timm Weski, Bayerisches Landesamt für Denkmalpflege, Germany

For almost four centuries the river Danube was the frontier of the Roman Empire, which was controlled by a series of fortifications. Further river patrols were established as we know from iconographic and written sources. On the other hand archaeological evidence in comparison with the river Rhine is poor. Apart from the river patrol boats of Oberstimm, which were discovered in a small brook close to the Roman fort, there are only the remains of a harbour at Sorviodurum/Straubing. In close vicinity to two Roman forts with their civilian settlement the port was situated not directly in the river Danube, but in a former river arm next to the mouth of a small tributary. The construction consisted of a couple of stone finger piers and wooden palisades which acted perhaps as wave breakers. Though none of the elements dates younger than the third century AD it was most likely also used up to Late Roman times.

Along the northern shore of Lake Chiemsee runs a Roman road, which became the centre of a civilian settlement Bedaium/Seebruck. Here a landing place protected by two wooden finger piers was investigated. The construction had to be renewed towards the lake at least twice. This small landing place was part of the economic structure settlement.

In the paper the geographical situation of the harbours in relation to the settlements and the river system will be discussed. Further the various construction methods will be dealt with.

PISA AND PORTUS PISANUS FROM ANTIQUITY TO THE EARLY MIDDLE AGES: A TALE OF TWO CITIES

Marinella Pasquinucci, University of Pisa, Italy

In the late republican-early imperial period Pisa was 20 stadia from the seacoast, as documented by multidisciplinary research (palaeogeographic, archaeological and written sources). The city had a well integrated system of sea- and river- ports and calls. They were respectively affected by the impressive coastal and hydrologic evolution of the district. The main port was situated NNE of present Leghorn. It was described by Rutilius Namatianus (early 5th cent. BC). In the XVIII century Portus Pisanus is documented as an impressive Roman ruined town. Recent excavations provide evidence of the Roman settlement (2nd-6th century AD) and the adjacent seabed. This stretch of shallow water was navigated by appropriate crafts at least since the late7th-early 6thcentury BC. It was progressively and rapidly silted up by alternate sand and posidonia layers since the mid 2nd century BC, as a consequence of the late Republican colonization impact on the hinterland and possibly of a phase characterized by intense rainfalls. Activities connected with navigation were

progressively shifted westwards. Portus Pisanus and its economy were closely connected with Pisa and its territory.

Archaeological and written sources document that Portus Pisanus was active through the Middle Ages, conforming the shoreline geomorphologic evolution.

VADA VOLATERRANA, ITS HINTERLAND AND THE MEDITERRANEAN TRAFFICS: A CASE STUDY OF EMBEDDED ECONOMY

Simonetta Menchelli, University of Pisa, Italy

Vada Volaterrana was the main centre of the Volaterrae harbour network from the Archaic period up to the Late Roman times, located in the Tyrrhenian coast between Populonia and Portus Pisanus, corresponds to modern Vada (Rosignano Marittimo, Livorno).

Part of the Roman harbour quarter (including horrea, a schola, two baths and other buildings) has been excavated in S. Gaetano di Vada , while the urban quarter is concealed by modern Vada.

We will focus both on the close economic interdependence among Volaterrae (the administrative centre), its harbour-town and its territory and on the import-export of the district (local, regional and Mediterranean traffics). State and free trade in the Volaterrae harbour system will be analyzed too, in a diachronic perspective.

PORTO PISANO AND THE PISAN HARBOUR SYSTEM IN THE MIDDLE AGES

Maria Luisa Ceccarelli Lemut, University of Pisa, Italy

In the early Middle Ages Porto Pisano kept its role, even though this was on a small and intermittent scale. In spite of the sources silence, the Pisans did not interrupt their sea activities through coastal navigation restricted to the Ligure and Tyrrhenian seas. The X century was the key period in the Pisan economic and politic development, when the town became a great naval power. Porto Pisano evolved into a very important commercial harbour and a halting-place in the sea travels to Rome, Jerusalem and the South France towards Santiago de Compostela. It was the main centre of a well integrated network of minor ports along the Tuscan coast from Versilia to Castiglione della Pescaia. Since the middle of the XII century, because of the progressive silting up of the lagoon, the harbour installations were reorganized and fortified and moved to a more external place,.

THE URBAN HARBOUR OF PISA

Gabriella Garzella, University of Pisa, Italy

Since the middle of the XII century, which was fundamental for town-planning urban rearrangement, the Commune of Pisa was built on the right bank of the Arno river.

Harbour installations linked to maritime commercial activity consisted of a fully equipped port and a large building (possibly a warehouse), which was the first element of the great import market in the square between the churches of S. Donato and S. Nicola. This was well-known by the sources of the XIII and XIV centuries. This entire system was completed by the customs office placed at the entrance in the town by river.

SEAPORTS AND FLUVIAL HARBOURS IN PORTUGAL: EVIDENCE FOR THE OPTIONS IN THE ATLANTIC SEALANES

Maria Luísa Pinheiro Blot, DANS – IGESPAR, Portugal

This paper presents the land and underwater archaeological evidences which allow us to bridge both territories of research under a common scope: to make them converge to a better understanding of the human/environment interactions concerning the geographical options for harbour activities in the western seashores and estuaries of the southwest Iberian territory, Portugal. The seaborne contacts and traffic of the early mariners coming from the Mediterranean, as an ancient stimulus, provide us some archaeological data to enable us to consider the natural adaptation to the natural conditions of the local ancient geography. The geomorphological studies making the link for the comprehension of such possibilities, we study the human interactions which suggest long distance seaborne traffic and harbour activities. Such elements are important especially when, besides the opacity of informal harbour places, with no harbour structures nor ship remains, their features reveal specialised areas having held ancient harbour functions. We consider the archaeological data lying beneath the waterfronts of the main cities of Portugal as witnesses of ancient maritime contacts.

ARCHAEOLOGICAL COMPLEX OF DESILO-HUTOVO BLATO, BOSNIA AND HERZEGOVINA

Snjezana Vasilj, University of Mostar, Bosnia and Herzogovina
Melisa Foric, Center for Balkan Studies, Bosnia and Herzegovina

The remains of the Illyrian ships discovered in the small Desilo Lake, in Herzegovina, dated at 2. Century B.C. are unique findings for the area of eastern Adriatic coastline. The geographical position of the lake Desilo, which enters the mainland quite deeply, makes a convenient and well protected harbor at the south-west part of the Hutovo blato. The large number of amphorae fragments (Lamboglia 2 type), iron Roman spears with partially preserved wooden handle, horse shoes indicate that these ships were sunk intentionally. These reasons make us reluctant to disqualify the possibility of a pirate attack which, in this case, could have been punished by the Romans.

The ships must be viewed in the context on the existence of Narona harbor, the Greek emporium and its background which was quite populated in the pre-Roman time and in a time of their rule.

The case of the sunken ships in the Desilo Lake, this archaeological complex should be viewed from multiple aspects – according to their appearance, as well as

finding the significant hill-top settlement above the lake. To testify this there are numerous findings of ceramics, particularly fragments of amphorae with stopples, roofing, numerous metal findings such as fibula, key with parts of the lock, Roman horse shoes and a graveyard with 18 graves so far. This unique micro-region without doubt played significant role in the time of the Illyrian kingdom and after as well as earlier in the Bronze Age, since new discoveries of the prehistoric layer in the lake itself, can offer some more answers about it.

A HOLISTIC VIEW AT THE ARCHAEOLOGY OF PORTS

T. Gambin, Department of Classics and Archaeology, University of Malta

The archaeology of ports is often taken to mean the material remains related to port structures such as moles, quays and warehouses. Other facets of ports are often overlooked and ignored. Through this paper I will illustrate how a holistic approach to port studies should start from a zone within the open sea where vessels adjust their course in order to approach harbour mouths. Within a harbour, the archaeological record may vary from the aforementioned structures to debris lost and/or thrown overboard. Finally, the archaeological remains related to port activity may today be situated away from the present day coast line, calling for the study of such remains to be carried out in the ambit of interdisciplinary cooperation.

THE WESTERN BLACK SEA COAST IN THE AGES: SURVEY METHODS OF UNDERWATER ARCHAEOLOGY AND SITE FINDINGS

Stiliyan Stanimirov, Central Archaeological Council, Bulgaria

The Black Sea basin is a largely undiscovered "museum," preserving the remains of millennia-old cultures along with traces of many centuries of navigation. For more than seven thousand years, the western Black Sea shore has been the portal of a number of significant civilizations, originating and developing on its coast and in the immediate hinterland. Due to environmental changes, much of what remains of these coastal civilizations is now under water.

Materials found on the sea floor raise a number of questions about the history of the western Black Sea coast, and its relations with the Mediterranean. This paper addresses some of these questions for the first time, and discusses a number of new sites found through underwater archaeology.

Archaeological research along the Bulgarian Black Sea coast has revealed many finds from submerged and partly submerged settlements, harbours and harbour facilities, and shipwrecks This paper will focus primarily on discoveries dated to the 3rd-2nd millennium BC, including Eneolithic and Bronze Age settlements that are now submerged.