Archaeology:
Just Add Water

volume II

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Archaeology:
Just Add Water
Underwater Research at the University of Warsaw

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Preface

Dear Colleagues,

It is our great pleasure to present to you the second volume of the U Supplement Series of the "Światowit" periodical. To a large extent it is based on the papers presented during the *3rd Warsaw Seminar on Underwater Archaeology*, which took place at the University of Warsaw on the 17th and 18th of January 2019.

An efficient and prompt process of editing we owe to the funding from the Ministry of Science and Higher Education, grant no. 959/P-DUN/2018.

Organization of the Seminar and publication of the hereby volume was possible thanks to the co-operation with the Polish Chapter of the Explorers Club, in particular its President, Professor Mariusz Ziółkowski, and the Vice-President, Marcin Jamkowski, to whom we are deeply grateful.

We would also like to acknowledge and appreciate the support of the University of Warsaw, namely the Vice-Rector Ph.D. habil. Maciej Duszczyk, the Dean of the Faculty of History, Ph.D. habil. Małgorzata Karpińska, Professor UW, as well as the Director's Board of the Institute of Archaeology: Ph.D. habil. Krzysztof Jakubiak, Ph.D. Michał Starski, and Ph.D. Marta Żuchowska.

The special thank you we traditionally owe to the Diving Museum by the Warsaw Diving Club, especially the Museum's Curator, Karina Kowalska, and the Club's President, D.Sc. Grzegorz Kowalski, who have been supporting our activities for many years, and constantly guide and help us in numerous enterprises.

We would like to extend our gratitude to all the Authors and Reviewers, who have been extremely diligent and punctual to keep up with our strict deadlines.

During the editing of the volume we have received invaluable consultations in the matter of ancient languages by Tomasz Płóciennik and Ph.D. Joanna Wegner, who we would also like to thank with all our hearts. The post-editing process was successful due to the the kind assistance of Ph.D. Rafał Dmowski, who we owe enormous gratitude.

The whole book was once again skilfully supervised and managed by the one and only irreplaceable Ph.D. habil. Bartosz Kontny, Professor UW. Him we would like to thank for all the advice and help with difficult choices, as well as the dedication to the organizational matters, even though the really tight schedule.

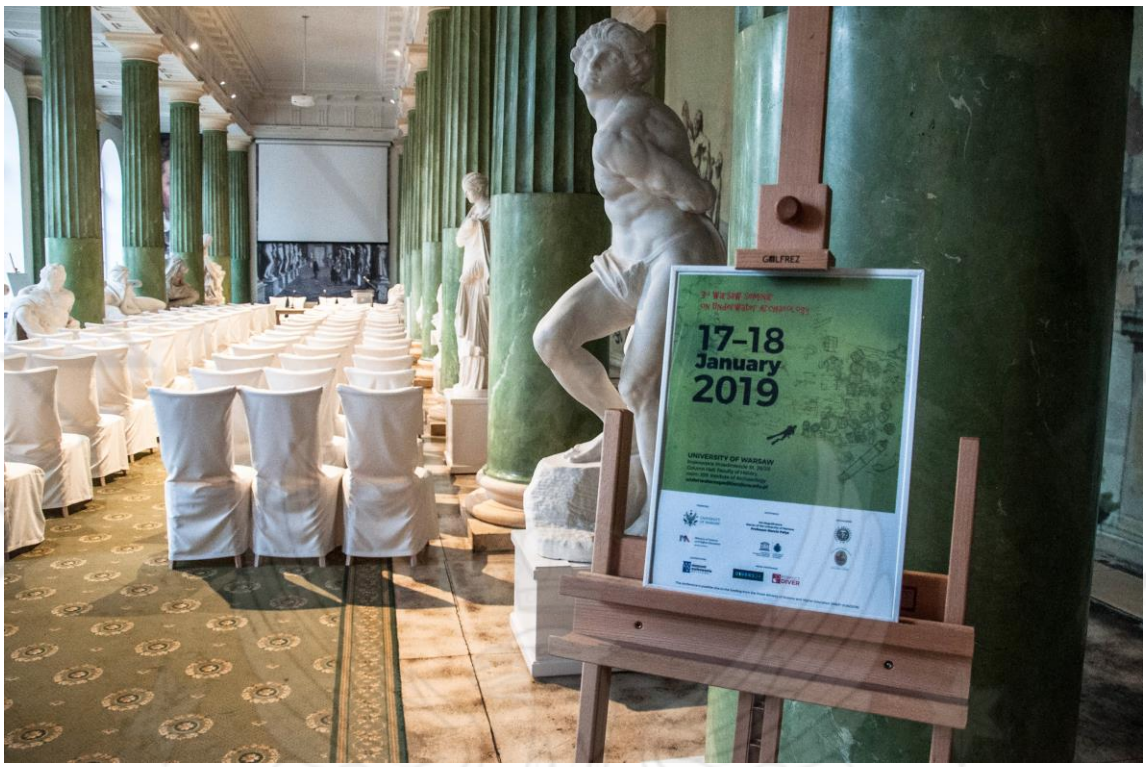
Last but not least, we would like to thank all the Readers who have reached for the hereby volume. We sincerely hope you will enjoy the outcome of our efforts and wish you pleasant reading!

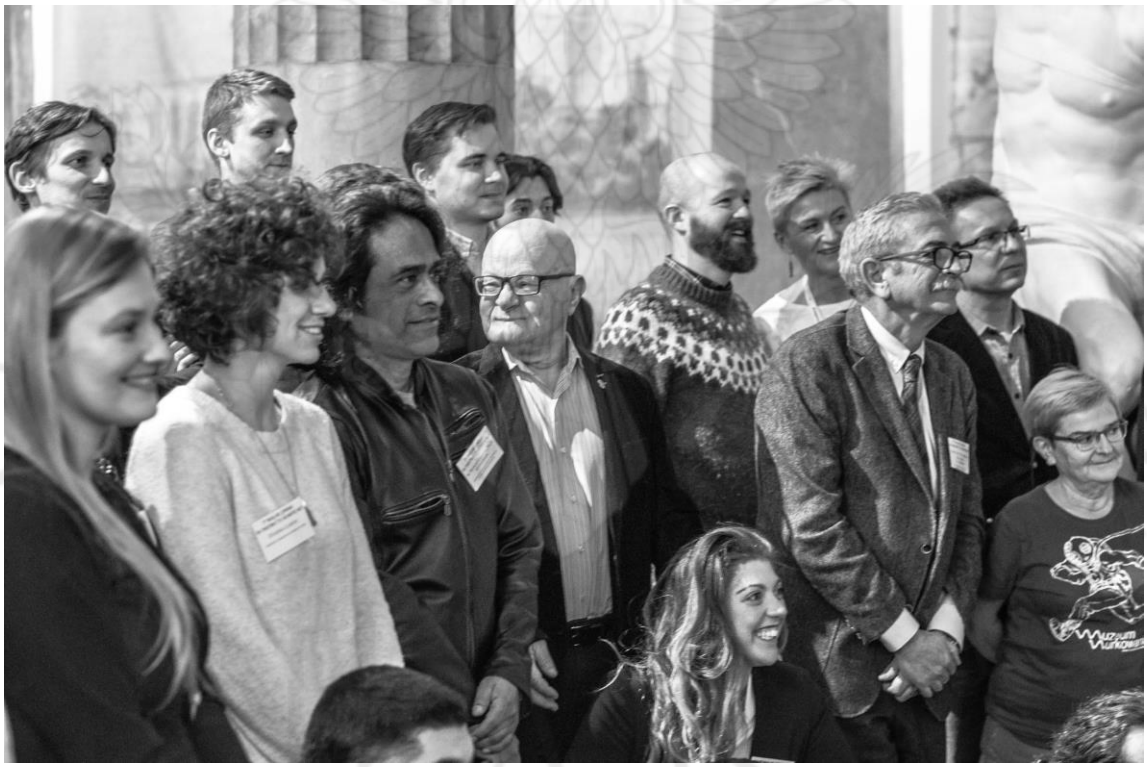
Aleksandra Chołuj

Małgorzata Mileszczyk

Magdalena Nowakowska

3rd Warsaw Seminar on Underwater Archaeology





3rd Warsaw Seminar on Underwater Archaeology held on 17th-18th of January 2019
at the University of Warsaw
(photos by: M. Sugalska)

Foreword

The volume, which we hereby present to our esteemed Readers, is the vivid proof that underwater archaeology at the University of Warsaw is doing more than well. It is the second publication in the ***"Światowit" Supplement Series U: Underwater Archaeology***, issued for now (and we hope this pace will be sustained!) with a frequency of a periodical. Within the book one might find i.a. the texts being an outcome of the international ***3rd Warsaw Seminar on Underwater Archaeology***, organized in the Institute of Archaeology, University of Warsaw. The Readers will discover here the articles presenting broad chronological and geographical range of issues: from the Prehistory until the Second World War, from Guatemala and Peru to Poland and Slovakia. We are trying to reflect this diversified character also by the choice of photographs on the cover.

The leitmotif of all this vast range of archaeological issues is **water**: realm bearing a magnificent symbolic character. Changing its colour (even during the day – from the blackness, through greyness, then blue, until the bloody-red at the sunset, turning again into black) and visibility, it has manifested also other features, which can be contemplated as signs of its animation, such as movement: horizontal (currents, waves, tides) and vertical (fluctuations of the surface). It was also the source of life quite literally, providing food and dihydrogen monoxide, essential for living.

Along with its whole mystery and dangerousness, water may also serve as a refuge (lake settlements from the early Iron Age) and a trade route, at the end of which there is a (hopefully) safe harbour. That is how underwater archaeology marches onto the land... Although, it is neither place nor time for the deliberation about the definitions of archaeology related to water environment; the discussion in this matter has lasted for many years, abound in more and more new terminological propositions, still being far from any resolutions. Whichever position we assume in the aforementioned debate, it is impossible not to notice that the symbolism, the rituals, and everyday casual activities essential for life and connected with water pass through each other, which is well-exemplified by the hereby volume. Objects lost during transportation and other kinds of exploitation of water basins, items put in the water as a matter of rituals, military aspects connected with watery environment, lake settlements, harbours, and trade – all of that and even more you can discover in *Just Add Water 2*. To all the Readers, who are going to immerse themselves into this topic, I wish a pleasant intellectual adventure and... good dives!

Bartosz Kontny

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Site Rybno I – Lake Grid Dwelling on Lake Piłakno and its Micro-Region. Research Proposal

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Abstract:

The lake grid dwelling Rybno I, Lake Piłakno (Mrągowskie Lakeland, Poland), first recognized in the 1920s, was a kind of a training site for Polish underwater archaeology in the 1960s; its milestone role in the field, complemented by the fact that it was never thoroughly studied and published, has led to the idea of introducing a project aiming at the comprehensive research of the settlement and its location. The work plan joins the research of the data acquired during previous fieldwork at the site itself and the surroundings of the lake with the innovative approach possible due to the access to modern but already proven equipment and methods.

Keywords:

grid dwelling, lake settlement, early Iron Age, West Balt Barrow Culture, Piłakno, Rybno

Introduction

In March 2019 a new research project within the scope of underwater archaeology has been inaugurated at the University of Warsaw. It has been granted funding from the National Science Centre, Poland[1] and is scheduled for the following 36 months. Its main objective is a comprehensive research of the submerged residues of the lake grid dwelling Rybno I, Lake Piłakno (Mrągowskie Lakeland, Masurian Lake District, north-eastern Poland). The project is centred on the site representing a very particular type of the early Iron Age settlement, traditionally defined as 'defensive', one of the distinctive features of the so-called West Balt Barrow Culture[2].

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[1] *Lake Grid Dwelling in Rybno, Piłakno Lake (Warmian-Masurian Voivodeship). New Ideas for Interpretation of the Lake Dwelling Phenomenon* (grant no. 2018/29/N/HS3/02949, PRELUDIUM 15 call).
[2] Also: West Baltic Barrow Culture.

The presence of the unique artificially constructed 'islands', intentionally located in the shallow lake bays, is unquestionably worth attention. The previous researchers have agreed to call this type of settlement 'grid dwellings' (e.g. Kola [ed.] 2000), as they were built by placing a wooden 'grid' at the bottom of a shallow bay, near the shore, enforcing it with soil, weighing down with stones, and then covering it with the platform, as a base for buildings. Rather small dimensions (estimated 5–6 super-structures) might be the evidence for atomization of the groups of the West Balt Barrow Culture, and maybe also for the inner hostilities, which might have been the impulse for building defensive settlements (e.g. Okulicz 1970: 72, 75; see also the chapter on the micro--region of Lake Piłakno). According to Jacek Gackowski, the closest analogy for this type of architecture seems to be the dwellings at the Belarusian Polesia (Gackowski 2000: 48–50, 63).

History of Research

Rybno has been known to scholars already before the Second World War, first noticed by a local forest-man, who has discovered some artefacts and reported it to *Prussia-Museum* in Königsberg. In 1933 Karl O. Rossius confirmed the location of the Piłakno *Pfahlbau* (for a long time sites of this kind were mistaken for palafittes) and mentioned the recovered artefacts: five round-bottomed vessels, a quern, and 'fishing-net weight' (Rossius 1933: 87). After the war, following the preliminary verification of the rather shallow site (1952, published: Antoniewicz 1955; 1959, published: Dąbrowski 1962) a joint team of archaeologists from the Polish Academy of Sciences and State Archaeological Museum in Warsaw has completed two seasons of fieldwork: in 1961 and 1962 (published: Odoj 1961; Bukowski *et al*. 1964; Bukowski *et al*. 1965; Bukowski 1965). Włodzimierz Antoniewicz, who led the first survey, has acquired two ceramic vessels collected by the discoverer of the site, Fryderyk Kulik, and stored in the forestry office. The lake shore pointed by Kulik was completely covered with reed, which made the actual investigation of the site impossible (Antoniewicz 1955: 355–356). In 1959 the team of divers has recovered *"plates, big--bellied and ovoid pots, cups, dishes, ladles, miniature vessels"* and other ceramic and stone (querns, grinders, polishers) artefacts (Dąbrowski 1962: 185–186). In 1961 the shore was still covered with reed, which was the first obstacle to overcome by the group of researchers, supported by sport divers. The site was located ca. 60 m from the shore, at a depth of 0.8–2 m (Bukowski *et al*. 1964: 72). The excavated sector was divided into 1 m^2 (the systematic underwater documentation was included in excavation schedule for the first time in the history of Polish underwater archaeology); the artefacts were located within. No stratification was

observed, so the layers were distinguished arbitrally. As far as documentation is concerned, drawn plans were prepared both underwater and from the surface; the underwater photography was also included. It is worth noting that the works under the surface were generally performed by four sport divers, supervised from the surface by archaeologists using goggles and snorkels (**Fig. 1**). The site was explored with an airlift (which was said to be ineffective) and than a water jet (strong water current; **Fig. 2;** Bukowski *et al.* 1964: 75). The researchers have discovered the layer of charcoal, which is an important matter to investigate in the current project (Mileszczyk 2018). Discoveries from the first season include: thirteen complete or nearly complete ceramic vessels, multiple pottery fragments, animal bones, stone artefacts (e.g. a quern), and a casting mould in three pieces, as well as multiple fragments of the wooden structure, including a piece interpreted as a sill or lintel (Bukowski *et al.* 1964: 80–86). In 1962 the new trench was connected to the former one; the work has continued in the first dig and then moved to the latter, but only the first strata has been researched; further efforts consisted in surveying the area to determine the stretch of the site. The divers used hookah surface-supplied system, where the air is delivered from the tank via single hose. The water jets were still used, but this time fixed on the iron rail. The team continued taking photographs both *in situ* and on the surface (Bukowski *et al.* 1965: 99–101). The results of the exploration were similar to previous year's – stone paving, burnt wooden elements (some of them interpreted as the residues of the residential-utility building) with traces of tools, pugging pieces, few pales, and mixed artefacts, including a fully preserver round-bottom vessel from the first trench and what was described as a 'ceramic spoon'. In the lakebed survey the divers have discovered some further pottery shards, querns and grinders, as well as what is described as the residues of hearths (Bukowski *et al.* 1965: 102, 105–108). The area of the site was finally approximated for 0.5 ha (Bukowski 1965: 117). The samples for pollen analyses were obtained both in 1961 and 1962 field season, from the lakebed in area of the settlement, nearby alder forest, peat bog, and the cultural layer under the construction beams. The results of the analyses were published; they did not appear to be helpful in many interpretations, apart from the general view on when the crop cultivation in the area has begun (ca. 2500 B.C.) and that the area has been successively de-forested, with a peak corresponding with the functioning of the lake settlement, which may be the proof of the increased role the agriculture has played. It was inferred that to catch the climate changes the research requires additional data and verification in the 'next research seasons'. Single sample from the top cultural layers was presented for the radiocarbon analyses, and the date 230+/–120 B.C. was established (Bukowski *et al*. 1964: 78–79; 1965: 109–111). The interpretation of the charcoal layer was that the platform has burnt, and that the water level

must have been at least a metre lower than in present, as the strata of burnt material occurs one metre below the surface (Bukowski *et al.* 1964: 80). In 1991 a group of young scholars from Nicolaus Copernicus University in Toruń began further verification of the site. Six most remote pales have been documented on the site plan with a traditional and the only available method: angular intersection. Applying the same method, the bathymetric plan has been elaborated and then, basing on the acquired data (clusters of artefacts, wooden elements, and the shape of the lakebed) the hypothetical frame of the artificial island has been established, being in disagreement with the results of the previous research. The team has collected the fragments of pottery, artefacts of antler, and a quern (Łapo and Ossowski 1995: 47–50). In 2000, as a matter of further research, seven samples were obtained for the dendrochronological analyses, only two of which occurred to be of oak. Unfortunately, it was impossible to get any conclusive results. Single radiocarbon analyses yielded 2370+/-40 BP (Krąpiec 2000: 74, 77). Due to the systematic development of the tree-ring database, an attempt to establish more precise chronology for the site is necessary. In some regions abundant in bog and lake sites the occupation of the area can nowadays be followed with a great (even calendrical) precision.

Lake Piłakno Micro-Region

Mrągowskie Lakeland covers the middle part of the Masurian Lake District, creating a particular kind of a hummock with culminations over 200 m a.s.l., towering over Olsztyńskie Lakeland at the west and the region called Kraina Wielkich Jezior Mazurskich ('Land of Great Masurian Lakes') at the east. A boarder of the moraine range of the Mrągowskie Lakeland stretches in between Stare Kiejkuty (east from Szczytno) and Ruciane-Nida, which matches the range of the moraines from the so-called Poznańska phase of the Weichselian glaciation (for the area of Poland called 'northern-Polish'), in some places represented by large clusters of boulders (e.g. the moraine by Wojnowo, by Ruciane-Nida). In the area of Lake Piłakno the moraines of the Pomorska phase of the Weichselian are present, having the parallel-wise pattern, and their relative heights reach 60 m. Next range of moraines leads through Sorkwity and Mrągowo, constituting the highlands embracing the niche of Lake Piłakno. Finally, at Mrągowskie Lakeland there are seven more or less parallel glacial troughs, and in one of them a ribbon lake called Piłakno is located (Kondracki 1972: 168–170). Rich land relief, numerous watercourses and reservoirs conducted the creation of small,

clearly separated settlement units, creating so-called 'niches' (*cf.* Nowakowski 1983: 316). One of such niches is the micro-region of Lake Piłakno, in the waters of which Rybno I is located.

The term 'micro-region' in the hereby paper is considered an area inhabited by a social group of the 'lowest level' (Okulicz J. 1983: 209), constituting a settlement community, consisting of an "*extended family or a kinship group*"[3] (Okulicz J. 1968: 39). It has been initially presumed that for the centres of micro-regions one should acknowledge the cemeteries (*cf.* Okulicz J. 1968: 39).

Obviously, without the written sources it is not possible to say what level of importance the cemetery had for the community; was it only the place of final rest, or also the centre of ritual activities? Either way, even as 'only' a resting place of the ancestors the cemetery must have born some kind of significance for the local community. It has been an indication and one of the causes for the bond joining such a group; even if the people have been changing the location of settlements, they moved nearby. Such an approach is suggested by the hitherto studies on the pre- and proto-historic settlement patterns (*cf.* e.g. Godłowski 1960: 55–75; Okulicz J. 1983: 207–209; Czarnecka 1990: 7–12). This thesis has to be verified by the hereby project.

The basis for the analyses cannot focus only on the research of the lake dwelling in Rybno, but also the part it played in the whole micro-region and the relations with the sites located nearby the ribbon of Lake Piłakno, with the special attention paid to cemeteries. One of the closest is the burial mound site Rybno II, studied initially in the second half of the 19th century (Hennig 1878: 480–498), and then in 1962 by Władysława Ziemlińska-Odojowa (1962: 818–820; 1981: 259–311); another one is the burial site Sorkwity III located in the close proximity (Hoffmann 1992: 327–332). The settlement grid around Lake Piłakno is complemented by the early Iron Age upland settlement in Maradki, surveyed in 1970 by Jerzy and Łucja Okulicz along with Ewa Gąssowska (Gąssowska and Okulicz Ł. 1970: 641–642; 1975: 319–326). The comparative analyses of the artefacts may answer multiple questions connected first and foremost with the relative chronology of the Rybno I settlement in this particular micro-region, as well as the structure and probable social stratification of the group having once inhabited the surroundings of the lake. It is important to establish in what relation the lake dwelling was with other sites and what the chronological interrelations in the area might be pointed; particularly: which of them have been functioning simultaneously. It can also be the premise for confirmation if the same group has used more than one settlementin the same time. To establish the range of the micro-region may not be the easiest task, although it can be assumed

[3] „*(Składająca się z) rodu lub grupy rodów*" (trad. M. Mileszczyk).

that a location of the site has been determined by the easy communication with the burial ground. It can be hypothesized that the inhabitants of the particular settlement have been using the closest cemetery.

Research Objectives and Implementation of the Project

The important result of the project is to be a monograph the lake dwelling in Rybno. This topic waited for the complete study for a long time (up till now the site was published only in the form of reports, Odoj 1961; Bukowski *et al*. 1964; Bukowski *et al*. 1965; Bukowski 1965; Łapo and Ossowski 1995: 47–50). What is more, most of the reports were printed before the most significant studies on West Balt Barrow Culture were announced (Antoniewicz 1964; Okulicz Ł. 1970; 1976; Hoffmann 1999; 2000). During the preliminary studies the working hypothesis has been elaborated, concerning the connection between the lake grid dwellings of the West Balt Barrow Culture and the early metallurgy, which is responsible for the concept of investigation of the idea behind the lake grid dwellings in south-eastern Baltic zone (Mileszczyk 2016a: 138; 2018). Apart from the new typological analyses of the artefacts recovered by the previous researchers, which is mostly completed by now (Mileszczyk 2016a; 2016b), non-invasive hydroacustic research, meticulous excavation of the relics, as well as the paleoecological analyses are planned, the purpose of which is the thorough depiction of Rybno settlement in the early Iron Age.

It is planned to implement the project with a wide range of methods, starting from (1) extended archive query, through (2) core-boring and analyses of the paleoecological samples (pollen and micro carbon residues), (3) elaboration of the model of terrain and orthoimage, (4) non-invasive hydro-acoustic survey aiming at bathymetry, (5) systematic underwater prospection, (6) traditional or underwater documentation of the residues of the lake dwelling (drawing and photography), (7) dendrochronological and radiocarbon dating, and (8) elaboration and dissemination of data. Proposed methods and technologies are to be innovative, but already proven in the fieldwork (side sonar, aerial photography, underwater metal detectors, LIDAR, photogrammetry etc.).

The extensive query in the archives and collections of Prussia-Museum, nowadays stored in Berlin (in the Museum for Pre- and Early History[4]), and the regional institutions of Warmia, Masuria, and northern Podlachia will allow summarizing the previous research and completing the renewed study on the artefacts recovered from Lake Piłakno during the 1961–1962 campaign

[4] German: *Museum für Vor- und Frühgeschichte.*

(stored in Museum of Warmia and Masuria in Olsztyn[5]). First of all, the archive query is necessary to complete the knowledge of the pre-war episode connected with Lake Piłakno exploration (Rossius 1933: 87). The discoveries were then deposited in *Prussia-Museum*, what was already confirmed – in the collection of Museum in Olsztyn there is an artefact no. 1131/69, complemented with the information that it was gained in 1945 from the collections of Prussia Museum. What is more, during the research in the Museum of Warmia and Masuria the archive of photographs has been discovered, mostly unpublished pictures from the 1961–1962 campaign[6] (**Fig. 1, 2**), but also the ones showing the round--bottom vessels labelled '*Ribben*' presented on the shelf, with the note "*reproduction from the archives of Prussia-Museum*" (catalogue no. 7138, 7139). The meticulous studies of the archives will enable to complement the information concerning the first research episode concerning the lake dwellings from Warmia and Masuria, contributing e.g. to the re-discovery of some sites due to finding out their location.

The pollen and micro-carbon analyses are the basis for an attempt of reconstruction of the early Iron Age paleoenvironment of the micro-region (how the lake has functioned in the cultural landscape of the early Iron Age, including e.g. the vegetation surrounding the lake, its water level etc., as well as establishing site's precise chronology). First and foremost, the samples for the paleoenvironment analyses have to be acquired both by coring the lakebed and from the cultural layers of the site. Effectiveness and rationality of the environmental analyses was indicated in numerous publications (e.g. Tobolski 1995; Filbrandt-Czaja 2000; Kupryjanowicz *et al.* 2013; Cywa *et al.* 2014; Menotti 2004; Fredengen 2002). This allows tracing the development of anthropopressure in the area of the research site as well as its impact on the water ecosystems, connected with cultural eutrophication; the past lake-level fluctuations might also be reconstructed. Micro-carbon analysis will allow e.g. looking into the layer of burning which is confirmed at the site by the previous expeditions. The chronology of the cores will be established with the method of radiocarbon dating (Mileszczyk 2018).

Proven modern methods for acquiring and synthesizing fieldwork data (hydroacustics, equipment for underwater photography, software) will be used to develop a bathymetric plan of the site and full underwater documentation, including photogrammetry or photomosaic. During the actual fieldwork the first phase is to acquire the data for the bathymetric plan (side sonar, Total Station). The second

[5] Polish: *Muzeum Warmii i Mazur w Olsztynie*.

[6] We wish to express our gratitude to Professor Mirosław J. Hoffmann Director Piotr Żuchowski (both Museum of Warmia and Masuria in Olsztyn) for the permissions to publish the archive photographs from the Museum's collections.

phase consists of the excavation, performed according to the well-established methodology and heritage office instructions. After the exploration, the accurate documentation will be elaborated, depending on the underwater conditions, mostly visibility (Mileszczyk 2018).

Independently from the underwater and hydroacustic research the model of the terrain and orthoimage are to be prepared. The data from LIDAR (used successfully in archaeology) will allow surveying the area concerning any new sites near the coastline and map it, which is especially useful in the hardly accessible areas. Application of further modern equipment to elaborate the orthoimage and the LIDAR data will facilitate the observation of the site from above – completely new perspective for the site, necessary in modern archaeological research (Mileszczyk 2018).

The last dendrochronological analyses were inconclusive; thus, it is important to make an attempt of establishing its chronology once again. Because of the development of the database for dendrochronology, attempts to establish the chronology of the site will be taken, thus the wood samples will be surfaced (Mileszczyk 2018).

The means of modern underwater research, including the use of metal detectors, are presumably the aid to answer the question about the lack of the metal objects at the site. The pollen, micro--fossil, and micro-carbon will also contribute to the latter, giving also the invaluable data on the past environment depiction. Establishing site's chronology, acquired both by dating the samples for pollen analyses and wood, will allow summarising the location of this particular lake dwelling in the broader horizon of this phenomenon, but also in the Piłakno lake micro-region. The side sonar scan, underwater photomosaic/photogrammetry, and the model of the lake micro-region are supposed to lead to the satisfactory results as far as the data for the reconstruction is concerned: hardly any data from previous excavations on the 'Polish' lake settlements might give the insight into the actual construction of such dwelling (apart maybe from some profiles provided by the 'dry' sites of this kind, e.g. Gackowski 1995). The objective of the hereby project is also recovering as much data as possible in this matter, which is to be a prominent start of the long further research leading into the possible reconstructions (Mileszczyk 2018).

Final Remarks

The issue of south-eastern Baltic region lake dwellings have to be included in the comparative study of the settlements built on water and marshes all over the world in different epochs. The proposed research, in all the aforementioned aspects, should lead to verification of the interpretation of function and origins of this kind of architecture in this particular area,

including the hypothetical connection of the lake grid dwellings with the early metallurgy. It is to be enhanced with the attempt of reconstruction of the ecosystem and the anthropogenic impact in the micro-region in the discussed period. It is presumed that the acquired results will be completing the state of research included in the published materials concerning this site and the issue from the larger point of view. The competent interpretation will be a significant step in the process of reconstruction of the full context of the idea for building on water. Last but not least: it is to contribute to the field of underwater archaeology; due to meticulous case study the methods and tools for this kind of fieldwork could be refined.

Literature:

Antoniewicz J.

1955 *Nowe zabytki z osady halsztackiej w Rybnie, pow. Mrągowo*, "Wiadomości Archeologiczne" XXII/3–4, 355–356

1964 *Osiedla obronne okresu wczesnożelaznego w Prusach*, "Światowit" XXV, 5–211

Bukowski Z.

1965 *Remarks on Archaeological Underwater Research Based on the Example of a Settlement within the Lake Piłakno, Mrągowo District (North-Eastern Poland)*, "Archaeologia Polona" VIII, 105–123

Bukowski Z., Dąbrowski J., Dąbrowski M., Odoj R.

1965 *Wyniki podwodnych badań archeologicznych w jeziorze Piłakno, pow. Mrągowo w 1962 r.,* "Sprawozdania Archeologiczne" 17, 99–113

Bukowski Z., Dąbrowski J., Odoj R.

1964 *Sprawozdanie z podwodnych badań archeologicznych w jeziorze Piłakno, pow. Mrągowo, w 1961 r.*, "Sprawozdania Archeologiczne" 16, 72–87

Cywa K., Wacnik A., Kupryjanowicz M., Mueller-Bieniek A., Karczewski M.

2014 *The Environmental and Cultural Contexts of the Late Iron Age and Medieval Settlement in the Mazurian Lake District, NE Poland: Combined Palaeobotanical and Archaeological Data*, "Vegetation History and Archaeobotany. The Journal of Quaternary Plant Ecology, Palaeoclimate and ancient Agriculture – Official Organ of the International Work Group for Palaeoethnobotany", DOI 10.1007/s00334-014-0458-y

Czarnecka K.

1990 *Struktura społeczna ludności kultury przeworskiej. Próba rekonstrukcji na podstawie źródeł archeologicznych i analizy danych antropologicznych cmentarzyska,* Warszawa

Dąbrowski J.

1962 *Recent Research on the Early Iron Age in the Territory to the East of the Lower Vistula,* "Archaeologia Polona" IV, 181–188

Filbrandt-Czaja A.

2000 *Vegetation Changes in the Surroundings of Lake Dgał Wielki in the Light of Pollen Analysis*, (in:) A. Kola (ed.), *Studies in the Lake Dwellings of the West Baltic Barrow Culture*, Toruń, 89–100

Fredengen Ch.

2002 *Crannogs. A Study of People's Interaction with Lakes, with Particular Reference to Lough Gara in the north-west Ireland,* Bray

Gackowski J.

1995 *Relikty zabudowy mieszkalno-obronnej osiedla nawodnego kultury kurhanów zachodniobałtyjskich w Mołtajnach, woj. Olsztyn (stan. 1). Charakterystyka planigraficzno-stratygraficzna zalegania struktur drewnianych i próba ich rekonstrukcji*, Acta Universitatis Nicolai Copernici, Archeologia XXIV,(Archeologia Podwodna 4, 7–46

2000 *On the Dating and Cultural Aspects of the West Baltic Barrow Culture Lake Dwellings*, (in:) A. Kola (ed.), *Studies in the Lake Dwellings of the West Baltic Barrow Culture*, Toruń, 9–64

Gąssowska E., Okulicz Ł.

1970 *Sprawozdanie z badań sondażowych osiedla obronnego w Maradkach, pow. Mrągowski w 1970 r*., "Kwartalnik Mazursko-Warmiński" 4 (110), 641–642

1975 *Badania sondażowe osiedla obronnego w miejscowości Maradki, pow. Mrągowo*, "Światowit" 34, 319–326

Godłowski K.

1960 *Studia nad stosunkami społecznymi w okresach późnolateńskim i rzymskim w dorzeczu Odry i Wisły,* Warszawa – Wrocław

Hennig A.

1878 *Die Hügelgräberbei Ribben, Kr. Sensburg, Altrpreussische Monatsschrift, der Neuen Provinzial-Blätter, vierte Folge* 15, Königsberg, 480–498; after: Hoffmann 1999, 146–147

Hoffmann M.J.

1993 *Wyniki badań cmentarzyska ciałopalnego w Sorkwitach, gm. loco, woj. Olsztyn. Kilka uwag o osadnictwie Pojezierza Mrągowskiego w I tysiącleciu p. n. e.,* "Sprawozdania Archeologiczne" XLV, 159–181

1999 *Źródła do kultury i osadnictwa południowo-wschodniej strefy nadbałtyckiej w I tysiącleciu p.n.e.*, Olsztyn

2000 *Kultura i osadnictwo południowo-wschodniej strefy nadbałtyckiej w I tysiącleciu p.n.e.*, Olsztyn

Kola A. (ed.)

2000 *Studies in the Lake Dwellings of the West Baltic Barrow Culture*, Toruń

Kondracki J.

1972 *Pojezierze Mazurskie,* (in:) R. Galon (ed.), *Geomorfologia Polski*, vol. 2, Warszawa, 161–178

Krąpiec M.

2000 *Dendrochronological Analysis of Wood from the Selected Lake Dwellings of the West Baltic Barrow Culture*, (in:) A. Kola (ed.), *Studies in the Lake Dwellings of the West Baltic Barrow Culture*, Toruń, 65–78

Kupryjanowicz M., Szal M., Wyczółkowski M.

2013 *Wpływ długotrwałej antropopresji na roślinność mikroregionu osadniczego nad jeziorem Salęt (Pojezierze Mrągowskie) – wstępne wyniki*, (in:) H. Ciecierska, C. Hołdyński (ed.), *Interdyscyplinarne i aplikacyjne znaczenie nauk botanicznych. Dziedzictwo przyrodnicze Warmii, Mazur i Powiśla: Przewodnik do warsztatów terenowych 56. Zjazdu Polskiego Towarzystwa Botanicznego Olsztyn, 24–30 czerwca*, 325–338, Olsztyn

Łapo M.J., Ossowski W.

1995 *Badania weryfikacyjne stanowisk archeologicznych z wczesnej epoki żelaza na Pojezierzu Olsztyńskim i Pojezierzu Mrągowskim*, Acta Universitatis Nicolai Copernici, Archeologia XXV, Archeologia Podwodna 5, Toruń, 43–53

Menotti F. (ed.)

2004, *Living on the Lake in Prehistoric Europe. 150 Years of Lake-Dwelling Research*, Routledge, London – New York

Mileszczyk M.

2016a *Lake Grid Dwelling Rybno I (Piłakno Lake, Mrągowskie Lakeland, Warmian-Masurian Voivodeship) – Impulse for New Interpretations,* "Skyllis" (Journal for Underwater Archaeology) 2/16, 136–140

2016b *Lake Dwellings of the West Baltic Barrow Culture in north-eastern Poland. The Case of Piłakno Lake (Rybno 1, Warmian-Masurian Voivodeship)*, (in:) Quaderni del Corso Internazionalizzato, SYNDESMOI 5, 57–70

2018 *Osada rusztowa na jeziorze Piłakno: Rybno, stan. I (woj. warmińsko-mazurskie). Nowe tropy w interpretacji fenomenu osadnictwa nawodnego / Lake Grid Dwelling in Rybno, Piłakno Lake (Warmian-Masurian Voivodeship). New Ideas for Interpretation of the Lake Dwelling Phenomenon* (grant no. 2018/29/N/HS3/02949, PRELUDIUM 15 call), unpublished

Nowakowski W.

1983 *Uwarunkowania mikroregionalne w północno-wschodniej Polsce,* (in:) J.K. Kozłowski, S.K. Kozłowski (eds), *Człowiek i środowisko w pradziejach,* Warszawa, 316–321

Odoj R.

1961 *Podwodne badania archeologiczne w Rybnie, pow. Mrągowo*, „Komunikaty Mazursko-Warmińskie" 3, 712–722

Okulicz J.

1968 *Niektóre zagadnienia struktury osadnictwa okresu późnolateńskiego i rzymskiego w północno-wschodniej Polsce*, (in:) *Studia z Dziejów Osadnictwa*, vol. 6, 29–46

1983 *Sposoby analizy źródeł archeologicznych w badaniach paleosocjologicznych i paleodemograficznych,* (in:) J.K. Kozłowski, S.K. Kozłowski (eds), *Człowiek i środowisko w pradziejach,* Warszawa, 206–213

Okulicz Ł.

1970 *Kultura kurhanów zachodniobałtyjskich we wczesnej epoce żelaza*, Wrocław

1976 *Osadnictwo strefy wschodniobałtyckiej w I tysiącleciu przed naszą erą*, Wrocław – Warszawa – – Kraków – Gdańsk

Rossius K.O.

1933 *Die sogenannten Pfahlbauten Ostpreussens*, "Prähistorische Zeitschrift" XXIV/1–2, 22–94

Tobolski K.

1995 *Możliwości poznania przeszłości na podstawie badań paleoekologicznych osadów jeziornych*, (in:) A. Kola (ed.), *Archeologia podwodna jezior Niżu Polskiego, materiały z konferencji Podwodne Archeologiczne Zdjęcie Niżowych Stref Pojeziernych, Wilkasy 21–22 kwietnia 1994*, Toruń, 157–164

Władysława Ziemlińska-Odojowa

1962 *Sprawozdanie z badań kurhanu z okresu lateńskiego w Rybnie, pow. Mrągowo (st. 2) w r. 1962,* „Komunikaty Mazursko-Warmińskie" 4 (78), 818–820.

Other Sources:

Reproduction from the archives of Prussia-Museum, catalogue of Museum of Warmia and Masuria no. 7138, 7139.

Fig. 1 – Archaeologist supervising the works of sport divers
(photo by: R. Odoj 1961; from the collection of Museum of Warmia and Masuria in Olsztyn)

Fig. 2 – Test of the equipment
(photo by: J. Dąbrowski 1961; from the collection of Museum of Warmia and Masuria in Olsztyn)

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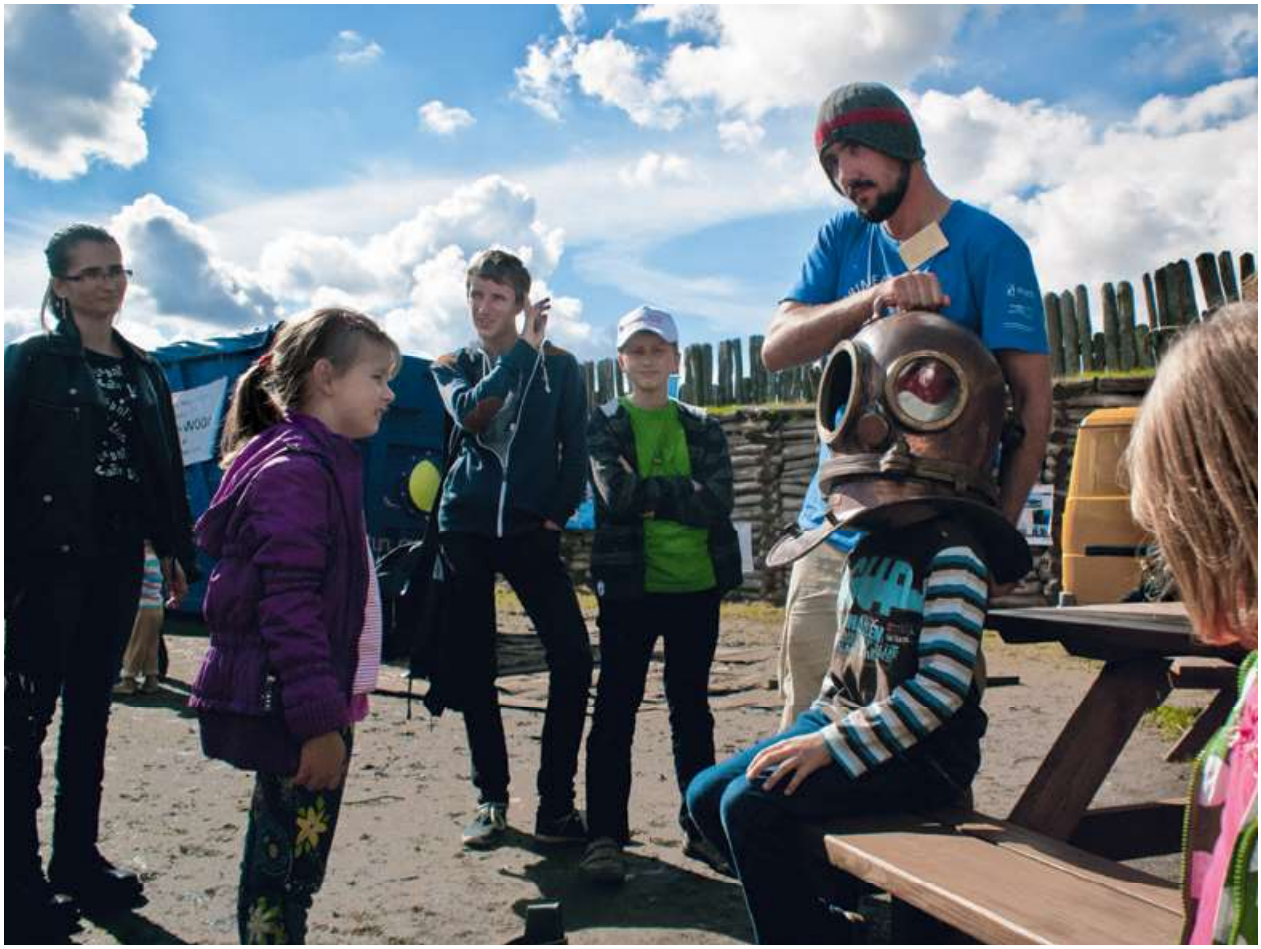

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