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## THE CONTRIBUTION OF FISHERIES TO THE ECONOMY OF MEDIEVAL SZCZECIN FROM THE PERSPECTIVE OF ARCHAEOLOGY

Research into early medieval fisheries in Poland started in the late 1940s and the 1950s together with large-scale archeological excavation connected with the forthcoming 1000<sup>th</sup> anniversary of the Christianization of Poland and the beginning of the Polish state. Some important discoveries were made during an excavation of a craft and fishing village in Gdańsk. Jerzy Kmiecinski's findings regarding the organization of sea fisheries and the existence of a fishing company in Gdańsk as early as the 12<sup>th</sup> and 13<sup>th</sup> centuries are among the forerunners of this kind of research<sup>1</sup>.

The issue of fisheries in medieval Szczecin has also been examined by archaeologists<sup>2</sup> for a long time and most thoroughly discussed in a study by Marian Rulewicz, dealing with the period between the 10<sup>th</sup> and the first half of the 13<sup>th</sup> centuries<sup>3</sup>. It has been nearly forty years since the publication of this most recent work, but the validity of many of the previous research results has not been questioned. This is mainly true about descriptions of fishing equipment and fishing techniques, in most cases, reconstructed based on some ethnographical analogues. According to archaeological data, fishing was one of the most important spheres of daily activities of the inhabitants of Szczecin<sup>4</sup>. Undoubtedly, it was a major source of food supply practically

regardless of the season of the year. Thanks to excavation, in the fill of the majority of buildings and within settlement areas, objects used for fishing, including tools indispensable for making and repairing fishing nets, fragments of starboards and larboards of woodblock boats and dug-outs as well as fishbones have been found. In addition, the extent and structure of fisheries have been revealed due to analysis of ichtiological remains collected from the cultural layers at Castle Hill (Wzgórze Zamkowe) and the Oder River quarter in Szczecin<sup>5</sup>.

The beginnings of Szczecin are associated with an open farming and livestock farming settlement founded on what is now Castle Hill around the mid-8<sup>th</sup> or the second half of the 8<sup>th</sup> century. The settlement started to develop into a local handicraft and exchange centre becoming a part of the so-called Baltic Sea Region Economic Zone. The site was surrounded with fortified defensive structures in the third quarter of the 9<sup>th</sup> century at the latest. At the beginning of the 10<sup>th</sup> century, the settlement expanded to occupy the area along the riverbank at the foot of the hill. Thus, a two-part residential complex was formed, composed of the 'traditional' quarter located on the hilltop and the newly built section situated on the floodplain adjacent to the Oder River. Throughout the 11<sup>th</sup> century, despite short-lived recession periods, the Szczecin centre flourished, being the organizer of the local exchange market and functioning as a politically independent municipal republic with the institution of *veche* (a popular assembly) composed of the most prominent local noblemen. The seizure of the city

<sup>1</sup> J. Kmiecinski, *Sprzęt rybacki i organizacja rybolówstwa w Gdańsku w XII i XIII w. w świetle prac wykopaliskowych w latach 1948-1951*, „Studia Wczesnośredniowieczne”, vol. III, 1955, pp. 212-216; see also: Z. Dąbczewski, *Szczątki ryb z grodu gdańskiego z XIII w.*, „Studia Wczesnośredniowieczne”, vol. 1, 1952, pp. 93-95 and K. Jażdżewski, *Charakterystyka wczesnośredniowiecznych warstw kulturowych w wykopie głównym na stanowisku I w Gdańsku*, „Studia Wczesnośredniowieczne”, vol. III, 1955, pp. 164-211.

<sup>2</sup> L. Leciejewicz, *Początki nadmorskich miast na Pomorzu Zachodnim*, Wrocław-Warszawa-Kraków 1962, pp. 110 seqq.; *Szczecin we wczesnym średniowieczu. Wzgórze Zamkowe*, eds. E. Cnotliwy, L. Leciejewicz, W. Łosiński, Wrocław-Warszawa-Kraków-Gdańsk-Łódź 1983; M. Dworaczyk, A. B. Kowalska, M. Rulewicz, *Szczecin we wczesnym średniowieczu. Wschodnia część suburbium*, ed. W. Łosiński, Szczecin 2003.

<sup>3</sup> M. Rulewicz *Ze studiów nad rybolówstwem we wczesnośredniowiecznych miastach przy ujściu Odry*, „Archeologia Polski”, vol. 19/2, 1974, pp. 387-482.

<sup>4</sup> It was even considered as the most important activity in the early literature, where opinions were formed based on scarce archeological research results (G. Labuda, *Problematyka badań*

*wczesnodziejowych Szczecina*, „Przegląd Zachodni”, vol. 8, 1952, p. 547).

<sup>5</sup> Z. Chełkowski, *Pozostałości ichtiologiczne z badań wykopaliskowych na grodzisku wczesnośredniowiecznym w Szczecinie (Wzgórze Zamkowe)*, „Materiały Zachodniopomorskie”, vol. 11, 1965, pp. 551-561; Z. Chełkowski *Szczątki ryb z warstw osadnictwa wczesnośredniowiecznego oraz kultury lużyckiej (Materiały z badań ratunkowych przy ul. Grodzkiej w Szczecinie)*, „Materiały Zachodniopomorskie”, vol. 12, 1966, pp. 121-141; D. Makowiecki, *Historia ryb i rybolówstwa w holocenie na niżu polskim w świetle badań archeologicznych*, Warszawa 2003; most recently B. Kłyszewko, Z. Chełkowski, B. Chełkowska, A. Sobociński, *Identyfikacja pozostałości ryb z wczesnośredniowiecznych warstw Rynku Warzywnego w Szczecinie*, „Materiały Zachodniopomorskie”, new series, vol. 2-3/1, 2006, pp. 375-395.

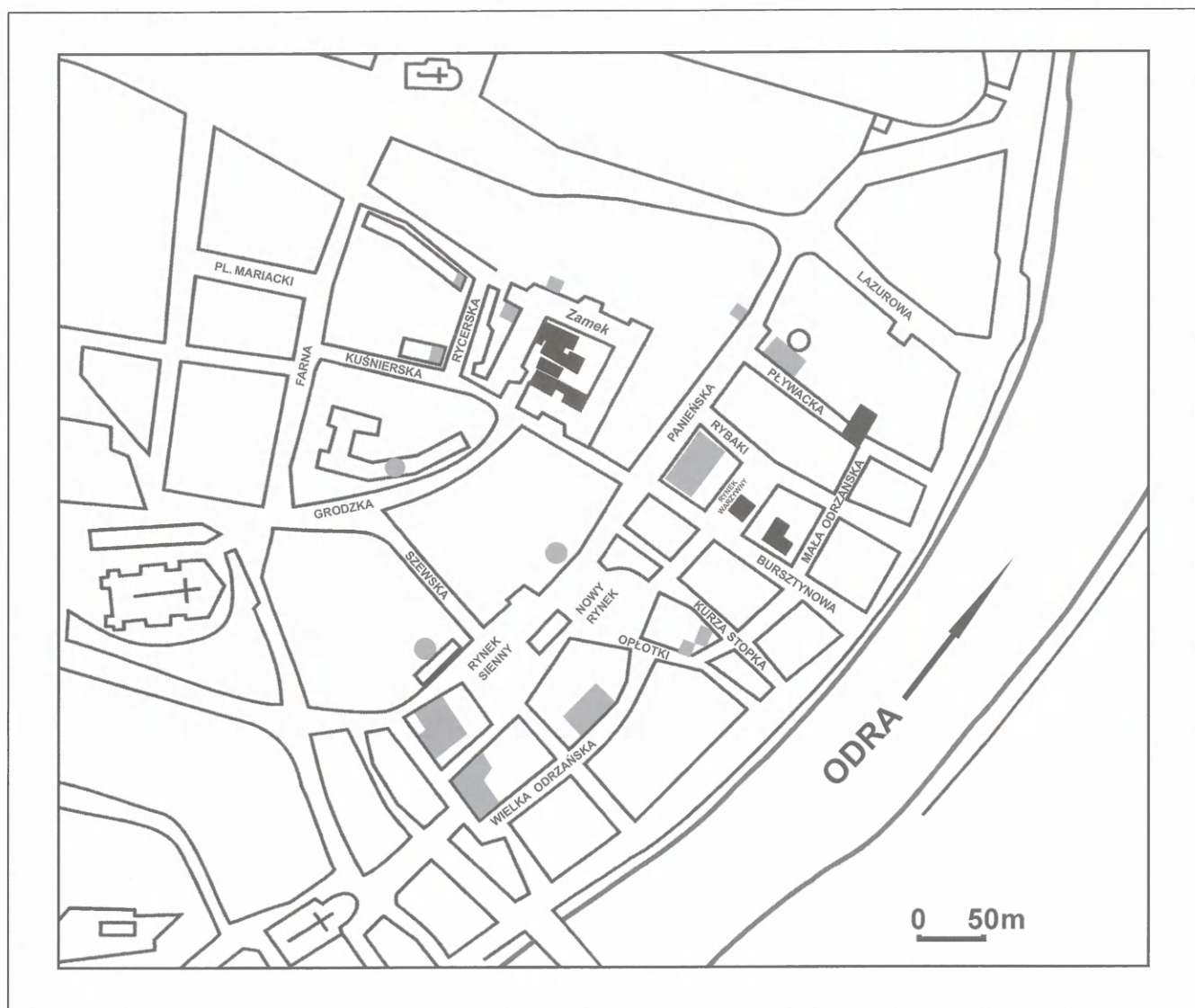


Fig. 1. Location of archaeological excavations within the Castle Hill and Podzamcze area. Excavations discussed in the present paper have been marked in black.

by Boleslaw III the Wry-mouthed and the introduction of Christianity brought about some major changes in the history of medieval Szczecin. The town, together with Western Pomerania, was incorporated into the early feudal structure of the Polish state. The office of castellan, subordinated to the duke and governing the town on his behalf, was established in 1140. Finally, in 1243, Szczecin was granted town laws in the form of Magdeburg rights and consequently entered a new stage of its development referred to as the late medieval city (Fig. 1).

From the point of view of archaeology, the intensity of fishing is reflected in a rise or decrease in the number of objects characteristic of fishing and varies depending on quarter of the town (Fig. 2- 3) and changes occurring at different stages of its development in the Middle Ages. A correlation between conclusions drawn from analysis of fishing equipment and ichthyological research results over shorter time spans may help reconstruct the organization and characteristics of fisheries and thus determine the

changing role of fishing in the economic development of the city, including both the intensity of fishing and the species structure of the catch. To some extent, this viewpoint differs from the opinion which has so far prevailed in the subject literature<sup>6</sup>.

Traditional fishing includes various methods of catching fish, which could well have been used in medieval Szczecin. These techniques took advantage of projectile type weapons, fishing net equipment and hooks attached to fishing lines, which were all found among archaeological relics discovered in all the excavated parts of the town. Most of the finds seem to have been connected with

<sup>6</sup> While discussing the issue, I took into consideration archaeological finds coming from the excavations situated at Castle Hill and three excavations located in present-day Podzamcze (excavation I – Rynek Warzywny, excavation III – located within quarter IV and excavation II – in the Seven Coats Tower area (fig. 1).

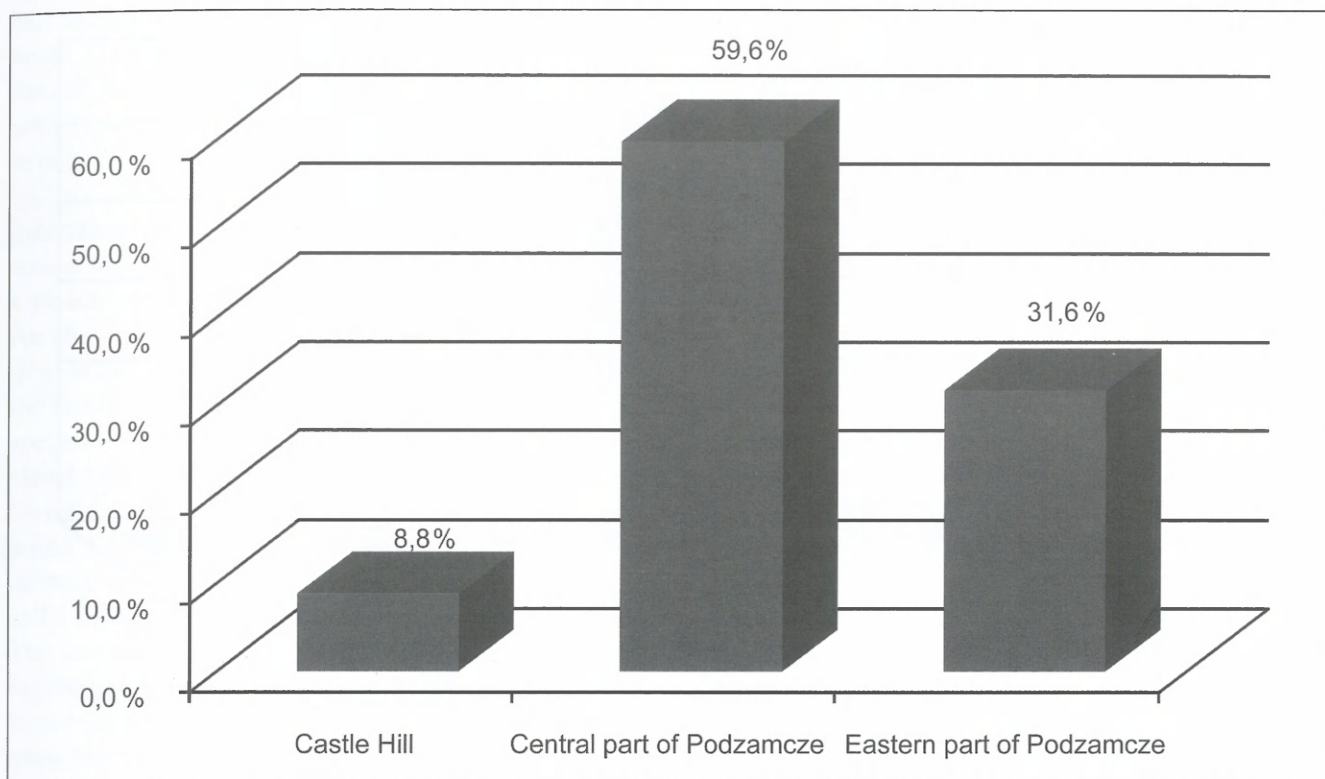


Fig. 2. Proportion of fishing gear elements in the Castle Hill and Podzamcze area.

so-called team fishing and much fewer could have been used for individual activity (Fig. 3). So far, no fragments of the simplest fishing tools, like wicker traps or putchers have been uncovered. However, in this case, researchers have at their disposal ethnological quest results confirming the popularity of simple fishing techniques and archaeological evidence does not seem to be indispensable. Information about the kind of water, time of the year and most effective tools deployed by fishermen can be obtained from experience. Also, social and economic changes must have exerted an influence on the scale and organization of fisheries as well as the species structure of the catch.

#### Fishing by means of projectile weapons and hooks

One of the oldest and most widespread methods of fishing seems to be fishing using projectile type weapons – fish spears and iron harpoons, fixed to a wooden butt<sup>7</sup>. With the passage of time, fishermen gained more and more knowledge about the behaviour of various fish species and consequently besides single flue tools multiple flue harpoons, equipped with three or more barbs, started to be deployed. One flue harpoons were mostly used for inland fishing but were also popular with sea fishermen. In the case of inland waters, projectile type weapons were applied to catching various species of large fish: pikes, sturgeons, salmon, trouts, graylings, carps, tenches, wels catfishes

and perches. They were also used for catching crayfish as well as seals and porpoises on the shore of the Baltic Sea<sup>8</sup>.

Fishing techniques involving the use of fish spears had remained unchanged for centuries. Large fish were killed from a boat or the fisherman simply paddled in the shallows throwing a spear or harpoon. Fish escaping from the net were also finished off in this way. Fishing from a boat by night is regarded as the most ancient method of fishing with this type of tool. Each boat had a so-called basket with fire attached to the stem, which was supposed to attract and at the same time stun fish, which would remain motionless for a while and could easily be stabbed with the metal point of a spear<sup>9</sup>. Such tools were particularly effective while hunting for fish during spawning season. In winter, they were used for catching fish in air-holes made in the ice. Therefore, fish spears were used both for daylight and night fishing, during different seasons of the year, using a boat or without one, under the ice or in air-holes. However, in the majority of cases, there was only one person involved in the activity. For this reason, this fishing method can be termed an 'individual' method.

The fact that pricking was one of the fishing methods used by the inhabitants of medieval Szczecin has been confirmed by fish spears uncovered in all the excavated parts of the town. The two oldest specimens come from excavation I located at Castle Hill. They were both discovered

<sup>8</sup> *Ibidem*, p. 127.

<sup>9</sup> M. Znamierowska-Prüfferowa, *Tradycyjne rybolówstwo ludowe w Polsce*, Toruń 1988, p. 32.

<sup>7</sup> M. Znamierowska-Prüfferowa, *Rybackie narzędzia kolne w Polsce i w krajach sąsiednich*, Toruń 1957, pp. 126-149.

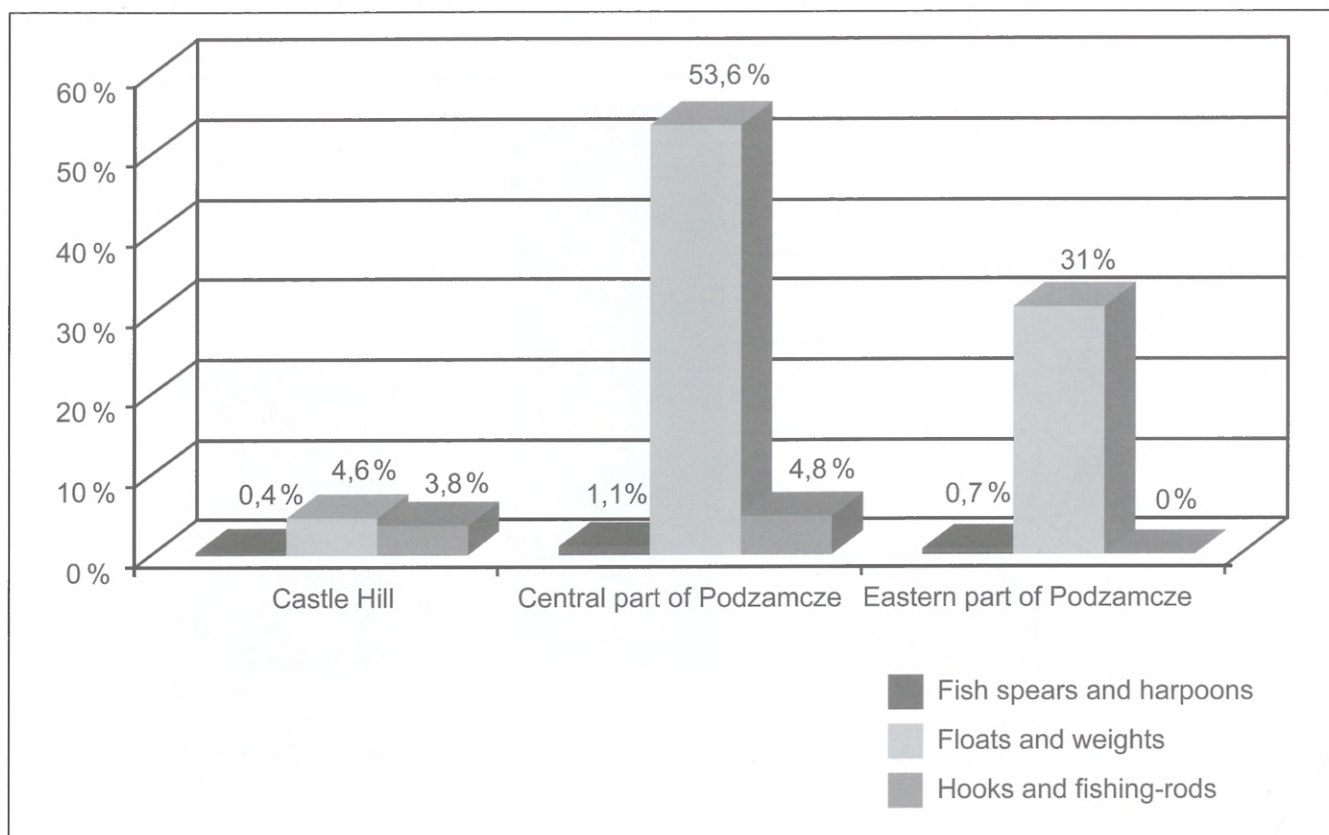


Fig. 3. Proportion of fishing equipment elements in excavations located at Castle Hill and in Podzamcze.

in layers dated to the close of the 8<sup>th</sup> and the 9<sup>th</sup> centuries. In building fills dating back to this period, everyday objects, such as clay vessels, iron knives, pieces and fragments of wooden vessels, simple tools – bone awls, horn combs, wetstones – were found<sup>10</sup>. Two oak oars, an iron fish spear and a wooden block, which could have been used for spooling the line, suggest a connection with water<sup>11</sup>. These relics were used for individual fishing,

<sup>10</sup> It should also be noted that in the case of some objects, particularly a bone comb with long teeth – a so-called weaver's comb, layer XII may not have been the original archeological context. The oldest specimens of this type come from layer X uncovered in Rynek Warzywny, in the Oder River quarter, dated to the close of the 12<sup>th</sup> century, and from the excavation III strata dating back to the first half of the 13<sup>th</sup> century located in the eastern part of the city. In European centres, bone weaver combs were used during the period between the close of the 12<sup>th</sup> and the 13<sup>th</sup> centuries. (K. Jaworski, *Wytwórczość kościanych i rogowych przedmiotów w późnośredniowiecznym Wrocławiu*, [in:] *Kultura średniowiecznego Śląska i Czech. Miasto*, ed. K. Wachowski, Wrocław 1995, p. 151), the oldest artefacts found in Pomerania are sometimes dated to as early as the close of the 11<sup>th</sup> century (E. Cnotliwy, *Rzemiosło rogownicze na Pomorzu wczesnośredniowiecznym*, Wrocław-Warszawa-Kraków-Gdańsk 1973, p. 231), and the most recent ones to the close of the 14<sup>th</sup> and the 15<sup>th</sup> centuries (M. Rębkowski, *Wyroby z rogu i kości, bursztynu, kamienia, szkła oraz gliny*, [in:] *Archeologia średniowiecznego Kołobrzegu*, vol. 1, ed. M. Rębkowski, Kołobrzeg 1996, p. 337).

<sup>11</sup> *Szczecin we wczesnym średniowieczu. Wzgórze Zamkowe...* pp. 15-19.

which could have been done in at least two ways: pricking fish with a fish spear or angling by means of a floating fishing device, consisting of a wooden block or reel and a line with a bait and hook attached to its end. Equipment of this type could be used even for deep water and winter air-hole fishing<sup>12</sup>.

The archaeological layer in which the second fish spear was found is characterized by a great diversity of utensils connected with everyday life<sup>13</sup>. Besides the spear two coiled iron wire hooks with an s-shaped eye<sup>14</sup> classified as so-called group III (type A) relics according to the classification of Marian Rulewicz<sup>15</sup> were used for fishing. Hooks of this type are considered elements of eel fishing gear, so-called eel lines. It may tentatively be assumed that this method involved a number of persons working together<sup>16</sup>. Nonetheless, the fact that fishing equipment coming from the earliest chronological horizon at Castle

<sup>12</sup> M. Znamierowska-Prüfferowa, *Tradycyjne rybolówstwo*, p. 37.

<sup>13</sup> *Szczecin we wczesnym średniowieczu. Wzgórze Zamkowe*, pp. 19-27.

<sup>14</sup> *Ibidem*, fig. 16:9.

<sup>15</sup> M. Rulewicz, *Rybolówstwo Gdańska na tle ośrodków miejskich Pomorza do IX do XIII wieku*, „Gdańsk Wczesnośredniowieczny”, vol. 10, 1994, pp. 31-374.

<sup>16</sup> L. Leciejewicz, M. Rulewicz, *Sposoby zdobywania pożywienia*, [in:] *Szczecin we wczesnym średniowieczu. Wzgórze Zamkowe...*, pp. 54-262.

Hill was mainly connected with the realization of the basic needs of a household, that is to say, the supply of food to the family, cannot be questioned. At that time, economic activity directed toward the supply of goods was limited to only some sectors of production<sup>17</sup>.

In addition, a characteristic element of fishing termed individual fishing is metal hooks. One of the techniques where such hooks were used was fishing by means of a floating device with a bait and hook mentioned above. Another method was so-called eel lines. A line consisting of a set of shorter lines with a bait and hook attached to the end of each line stretched across the current could be applied to catching eels. However, a hook is mainly associated with a line and a wooden rod, a technique used for 'individual' fishing. In the majority of cases, only single hooks were unearthed at Castle Hill. Sometimes, two or three specimens were found in one stratum. Sporadically, such finds were accompanied by single bark floats. The interesting thing is that hooks were usually found together with other objects belonging to persons who must have been relatively well off, for example, amber articles, glass Mountain Crystal beads, as well as a pair of bronze scales. In later archaeological contexts, dated to the 11<sup>th</sup> and the beginning of the 12<sup>th</sup> centuries, single hooks are accompanied by not only 'ordinary', everyday objects but also traces of local production: textile manufacturing, metalworking, working with antler and skin manufacturing. Consequently, catching fish seems to have been nothing more than a way of complementing and enriching a daily diet. No evidence has been found of fishing constituting a more significant element of the everyday job structure, going beyond satisfying a household's needs. This model of the 'fishing economy' corresponds to the model known from earlier periods, namely the Bronze Age and the Iron Age, which has been confirmed by archaeological evidence<sup>18</sup>.

The distribution of individual fishing articles in the cultural layers discovered in the Oder River quarter in Szczecin, situated directly on the river bank, is slightly different. Six single flue fish spears were discovered in a remarkably rich in everyday objects context in Rynek Warzywny (Vegetable Market), in the central part of present-day Podzamcze (Castle Borough). The relics were scattered over a vast area in layers dated to the period from the 10<sup>th</sup> to the close of the 8<sup>th</sup>-9<sup>th</sup> decades of the 12<sup>th</sup> century. Besides the spears 30 hooks were uncovered, including 26 iron relics and 4 hooks made of coloured metals. In addition, according to some researchers iron crampons used

for air-hole fishing are also classified as part of standard fishing equipment<sup>19</sup>.

Only three fish spears and a harpoon were found in excavation III situated in the eastern part of Podzamcze. They all come from layers dated to the second half of the 11<sup>th</sup> and the 12<sup>th</sup> centuries<sup>20</sup>. Two of the spears are single flue relics and one is a three flue specimen<sup>21</sup>, the only spear of this kind discovered in Szczecin so far. Like one flue spears, it is a common fishing tool<sup>22</sup>. It may only be noted that equipment of this type was used for catching smaller fish travelling in schools. According to Maria Znamierowska-Prüfferowa, the construction, technique of construction, size and form of inland and sea fish spears depended on a number of factors, including the type of fish to be caught, the kind of water the tool was used in, the material and time the fisherman had at his disposal, as well as the tradition prevailing in a given village, settlement or area<sup>23</sup>. Working on this assumption, the conclusion can be drawn that in early medieval Szczecin, one flue fish spears were preferably used for individual fishing and catching large fish. What is more, the possibility that they were also used for hunting porpoises and seals in the bay is not to be excluded. Seal bones were recognized among osteological remains found in small quantities in the strata dating back to the period between the first half of the 10<sup>th</sup> and the first half of the 13<sup>th</sup> centuries in Rynek Warzywny<sup>24</sup>. The use of seal skins for local skin production was confirmed by archaeological evidence, namely a waste piece of tanned fur skin uncovered on the site<sup>25</sup>.

A harpoon discovered in a layer dated to the mid-12<sup>th</sup> century may also be associated with catching large fish<sup>26</sup>. This relic belongs to the group of projectile throwing

<sup>19</sup> M. Znamierowska-Prüfferowa, *Tradycyjne rybolówstwo...*, p. 106; M. Rulewicz, *Rybolówstwo Gdańska ...*, p. 274. It seems that functions performed by these objects were not limited to ice fishing during winter. Crampons were ideal for moving on all kinds of slippery surfaces, for example, wet wood (Cf.: H.E. Saggau, *Mittelalterliche Eisenfunde aus Schleswig. Ausgrabung Schild 1971-1975*, „Ausgrabungen in Schleswig. Berichte und Studien“, vol. 14, 2000, Neumünster, fig. 67). They were easy to mount on the hooves of draught animals. Crampons are known from a large number of sites, which vary in respect of chronology and function.

<sup>20</sup> *Szczecin we wczesnym średniowieczu. Wschodnia część suburbium*, tables 85-89.

<sup>21</sup> *Ibidem*, figs. 34:8; 42:19; 66:10.

<sup>22</sup> M. Znamierowska-Prüfferowa, *Tradycyjne rybolówstwo...*, p. 28.

<sup>23</sup> *Ibidem...*, pp. 27-28.

<sup>24</sup> A typed copy held in the archives of the Institute of Archaeology and Ethnology, Polish Academy of Sciences, Branch in Szczecin.

<sup>25</sup> Analysis by Teresa Radek PhD, Wrocław University of Environmental and Life Sciences. A typed copy in the archives of the Institute of Archaeology and Ethnology, Polish Academy of Sciences, Branch in Szczecin.

<sup>26</sup> *Szczecin we wczesnym średniowieczu. Wschodnia część suburbium*, fig. 66:11.

<sup>17</sup> W. Łosiński, *Miejsce rzemiosła w dziejach handlu dalekosiężnego w krajach strefy nadbałtyckiej*, [in:] *Archeologia w teorii i praktyce*, eds. A. Buko, P. Urbańczyk, Warszawa 2000, pp. 493-506.

<sup>18</sup> D. Makowiecki, *Historia ryb...*, p. 99.

weapons, which were once in widespread use both chronologically and territorially. The tool consisted of a barbed butt and a rope. The fisherman threw a harpoon and the animal pulled the rope<sup>27</sup>. The use of a harpoon required great skill and practice, because fish were usually caught from a boat. In addition, the types of fish caught on inland waters were very large species, for instance, the sturgeon and wels catfish. A barbed hook with an s-shaped eye<sup>28</sup>, which could also have been used for pricking, belongs to the same group of tools. However, according to ethnographical data, this tool was most probably used for dragging large fish into the boat or onto the shore.

### Net fishing

Net fishing differed considerably from capturing fish with a harpoon or spearfishing and opened up new possibilities. Throw or cast nets, dip and hand nets<sup>29</sup> were mostly used for catching smaller fish, feeding in flocks, during spawning season and in backwaters. These simple tools are mainly known from ethnographical studies. Parts of seine equipment, such as bark or wooden floats, weights made of rock materials or baked clay, so-called seine float balls and sporadically net suspenders, are most often found in archaeological material. The shape of seines varied depending on the kind of fish caught, season of the year and character of the fishery. The common characteristic is the fishing technique, consisting in encircling a school of fish by pulling a seine, which hangs in the water due to weights along the bottom edge and floats along the top<sup>30</sup>.

The most characteristic elements of a seine are floats, which, in the case of Szczecin, were usually made from pine or oak bark<sup>31</sup> or, less frequently, wood, and so-called float balls, made from different types of wood, including poplar, alder and ash wood. Twenty-four floats were uncovered in excavations located at Castle Hill. One of the relics was made of wood and damaged, the others were made of pine bark. They were found in the majority of early medieval layers dating from the close of the 10<sup>th</sup> century onward<sup>32</sup> and classified as Types A and C according to the classification of Marian Rulewicz<sup>33</sup>.

More relics of this type were found in excavation III, situated in the eastern part of the *suburbium*, very close to

the Oder River. They were scarce and scattered. Although the area lies directly on the river bank, only 80 net floats, some of them partly damaged, were found. The majority of the finds were made of bark and 4 of wood<sup>34</sup>. The most interesting specimens are the floats classified as Type E (rolls of birch bark). Twenty-four specimens, that is, 30 percent of all the floats uncovered, were found in layers dated to the last stage of the functioning of the early medieval town. The interesting thing is that no floats of this type were unearthed at Castle Hill. In the central part of Podzamcze, Rynek Warzywny, only three such specimens were uncovered in layers dating back to the end of the first half of the 13<sup>th</sup> century.

Undoubtedly, the greatest number of net floats (usually made of bark) come from strata discovered in the central part of Podzamcze, Rynek Warzywny, where 214 relics of this type were found, including semi-finished and repaired products as well as pieces and fragments. They typologically correspond to finds from other parts of the city<sup>35</sup>. The specimens were scattered and unevenly distributed in the cultural layers. There were only a few specimens in each of the earliest strata and a dozen or so relics in later contexts, particularly those dating back to the period between the close of the 10<sup>th</sup> and the beginning of the 12<sup>th</sup> centuries. Characteristically, floats were often discovered together with another unique element of seine nets, weights, used for weighting the seine down and holding it upright (Fig. 4). A rise or decrease in the number of floats was accompanied by a proportional increase or fall in the number of weights.

The only floats with symbols which could be considered house marks, that is, graphical figures used to mark objects for recognition of ownership, were found in archaeological layers in Rynek Warzywny. All the five relics were discovered in strata dated to the 3<sup>rd</sup> quarter of the 11<sup>th</sup> century and classified as Type A. The floats were marked by cutting notches in the longer edge (1 specimen) or engraving a pattern, particularly an X, a Y or a rhomb, a zigzag or a filled triangle on the surface.

The uneven distribution of floats is reflected in the places and frequency of discoveries of wooden net float balls used in basic seine nets. Holding the net upright, they performed the same function as bark floats in seines. Depending on the fish species and their natural environment, active fishnets, including dragged seines, passive nets, for example, basic fencing seine nets, used for catching bottom fish, or floating nets, smoothly drifting in the water, used for capturing fish species which school or aggregate, such as herrings, were deployed. Net float balls were found mostly in the Oder River quarter area (about 60 complete specimens and about 60 fragments) and at

<sup>27</sup> M. Znamierowska-Prüfferowa, *Tradycyjne rybolówstwo ...*, p. 27.

<sup>28</sup> *Szczecin we wczesnym średniowieczu. Wschodnia część suburbium*, fig. 59:10.

<sup>29</sup> Cf.: M. Znamierowska-Prüfferowa, *Tradycyjne rybolówstwo...*, pp. 77-82.

<sup>30</sup> M. Znamierowska-Prüfferowa, *Ibidem ...*, p. 56.

<sup>31</sup> Dendrological analysis results in the archives of the Institute of Archaeology and Ethnology, Polish Academy of Sciences, Branch in Szczecin.

<sup>32</sup> L. Leciejewicz, M. Rulewicz, *Sposoby zdobywania pożywienia ...*, pp. 258-259.

<sup>33</sup> M. Rulewicz, *Rybolówstwo Gdańska...*

<sup>34</sup> A.B. Kowalska, *Przedmioty związane z rybolówstwem i sztuknictwem*, [in:] *Szczecin we wczesnym średniowieczu. Wschodnia część suburbium*, pp. 297-298.

<sup>35</sup> Por. A.B. Kowalska, *op.cit.*, fig. 151.

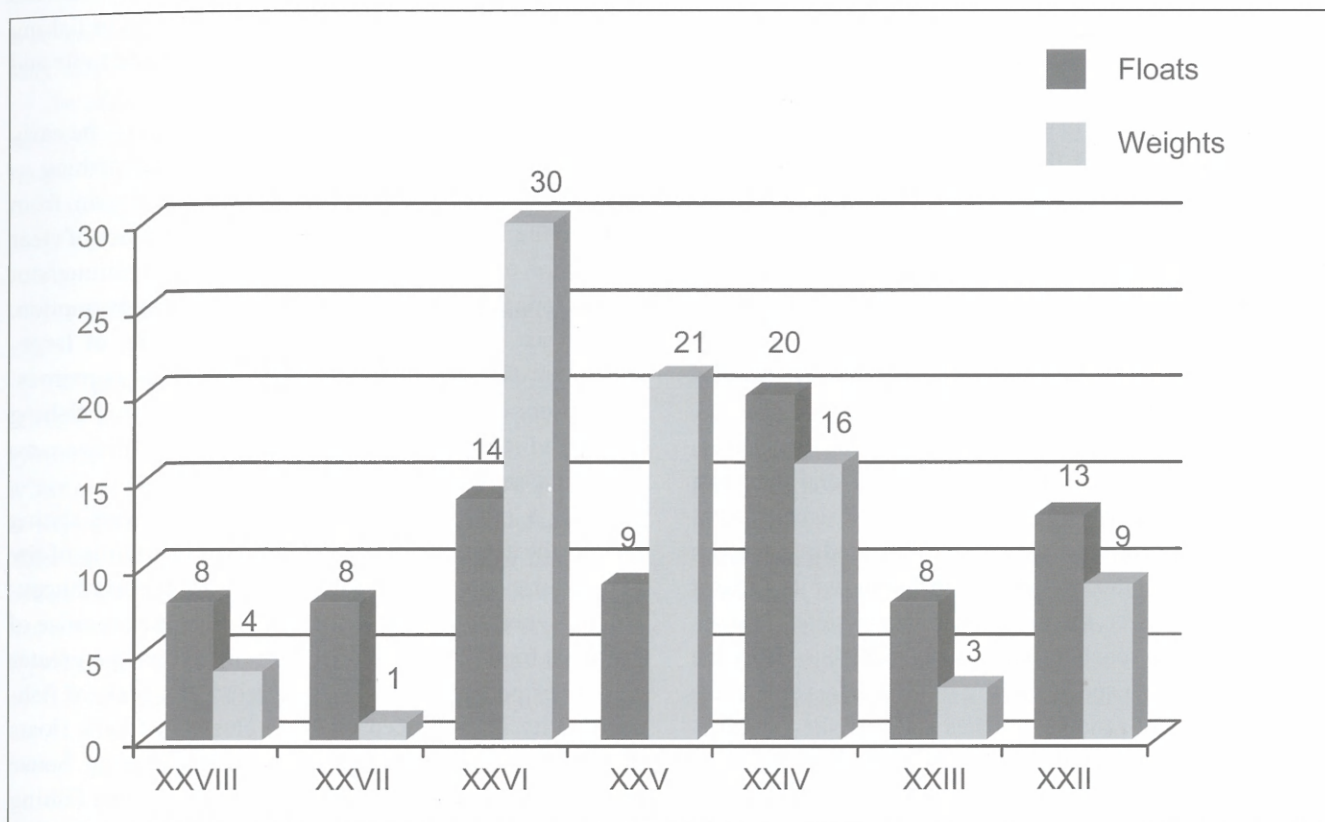


Fig. 4. Coappearance of seine fishing gear in layers dating from the close of the 10<sup>th</sup> – the 12<sup>th</sup> centuries in Rynek Warzywny, central part of Podzamcze.

Castle Hill, where only around a dozen such relics were uncovered, in layers dated to the 12<sup>th</sup> century<sup>36</sup>. In the central part of the Oder River quarter, net balls appeared in the contexts dating back to the period between the first half of the 11<sup>th</sup> and approximately the mid-13<sup>th</sup> centuries. The oldest balls found in the eastern part of the town date from the beginning of the 12<sup>th</sup> century<sup>37</sup>. It may only be noted that in the 12<sup>th</sup> century the number of bark floats discovered in the area considerably decreases and the number of net float ball, mostly made of alder and ash wood, rises<sup>38</sup>. This tendency may be a result of local preference or specialization in passive fishing.

As was stated above, another characteristic elements of seine equipment are weights. The simplest form of a weight is an almost oval, rounded pebble, flaked on both sides. Lumps of raw material easy to find in the vicinity of Szczecin and easy to chip, such as pieces of sandstone, quartzite, quartzite sandstone, gneiss, limestone, diorite, syenite and gabbroid, were commonly used for this purpose. The only examples are two phyllite rounded pebbles coming from a layer dated to the 3<sup>rd</sup> quarter of the 11<sup>th</sup> century. Besides, a few clay weights were uncovered in all excavations, in the layers dated to the period between the first half

of the 13<sup>th</sup> century and the last years of the functioning of the medieval town. Stone weights were completely replaced by clay ones as early as the second half of this century.

#### Fish species known from excavations in Szczecin

The diversity of fishing equipment suggests a diversity of fish species brought to and eaten within the town area. More relevant data was provided by ichthyological research results, particularly the analysis of fishbones and scales unearthed in excavations at Castle Hill and in Rynek Warzywny, the central part of Podzamcze<sup>39</sup>. In all the cultural data examined, 20 fish species were recognized, including sweetwater, slightly salty and mixed water fish<sup>40</sup>. It should also be noted that some fish have soft and porous bones and numerous chondral parts, which decompose easily. This may be the reason why no remains were found among ichthyological remains of such tasty fish as whitefish, brown trout and salmon<sup>41</sup>. Remains of some fish were present in abundance, others were found in trace quantities and constituted just a tiny percentage of the finds. Generally speaking, the quantity of fish calculated based on the amount of fish remains found in particular layers can be assumed to have remained relatively stable over centuries. The only deviations from the norm are values for layers

<sup>36</sup> L. Leciejewicz, M. Rulewicz, *Sposoby zdobywania pożywienia...* pp. 258-259.

<sup>37</sup> A.B. Kowalska, *op.cit.*, pp. 297-298.

<sup>38</sup> A.B. Kowalska, *op.cit.*, figs. 152-153.

<sup>39</sup> B. Kłyszajko et al., *Identyfikacja pozostałości ryb...*

<sup>40</sup> *Ibidem*, table 3.

<sup>41</sup> *Ibidem*, pp. 386-387.

dating from the close of the 11<sup>th</sup> and from around the mid-13<sup>th</sup> centuries, where the highest values were noted for both the quantity and number of fish caught, and layers dating from the close of the 10<sup>th</sup> – the beginning of the 11<sup>th</sup> centuries as well as the 1<sup>st</sup> quarter of the 12<sup>th</sup> century, the ones with the lowest values.

A certain regularity can be observed in the collation of fish species recognized in particular strata in Rynek Warzywny: the same types of fish were found and the proportion of each species was similar in all layers. This was particularly the case with sturgeons, pikes, asps, ideo and eels, caught through ‘individual’ or ‘team fishing’. Only traces of some other fish species were discovered, including saltwater fish, like twaites shads and herrings, fish living in slightly salty water, such as knives, coastal sea water fish (vimbas), as well as fish feeding deep in sweetwaters near the bottom, for example, white breams and ruffes. However, the most popular fish were common breams, zanders, roaches, tenches and catfishes. They are all sweetwater fish species living in large lakes and rivers and in the case of zanders, tenches and catfishes, in overgrown coastal waters with a muddy bottom.

Among the most highly valued edible fish species, including common breams, tenches, catfishes and zanders, slightly more significant differences are to be seen in the structure of ichtiological remains. The greatest proportion of the common bream and zander could be observed from the close of the 11<sup>th</sup> to the end of the 2<sup>nd</sup> quarter of the 12<sup>th</sup> centuries. Tenches were the most numerous species in the layers dating from the 1<sup>st</sup> half of the 10<sup>th</sup> to the 3<sup>rd</sup> quarter of the 11<sup>th</sup> century. It may also be noted that the relatively stable proportion of pike bones falls dramatically in the period between the end of the 2<sup>nd</sup> quarter of the 12<sup>th</sup> century and the beginning of the 13<sup>th</sup> century. At the same time, the zander and roach grew in importance, the latter especially in the period between the close of the 12<sup>th</sup> and the 1<sup>st</sup> half of the 13<sup>th</sup> century.

In excavations located at Castle Hill only sweetwater fish were recognized, among which common breams (approximately 33%) and zanders (approximately 23%) were the most numerous species. Roaches, tenches, crucians, white breams, chubs, orfes, asps, barbells, rudds, zopes, perches and sporadically knives and vimbas were also served and eaten. Eel remains were hardly ever found. The presence of ‘individual’ and ‘team’, active and passive fishing equipment seems absolutely justified in this context. Some of the fish mentioned above are solitary species while others, for instance, common breams and roaches, feed in flocks.

### Conclusion

The above simple and very general percentage analysis clearly reveals a vast disproportion between the amount of fishing equipment discovered in the strata uncovered at Castle Hill and the number of finds coming from the Oder

River quarter (Fig. 3). However, the differences in fishing methods seen through the prism of characteristic tools and objects seem particularly significant.

Finds coming from the hill, the oldest part of the early medieval complex, seem to point to individual fishing as a way of catching fish. The broad chronological span, from the 9<sup>th</sup> to the 1<sup>st</sup> half of the 13<sup>th</sup> centuries, and a lack of clear clusters of tools lead to the conclusion that throughout this period, fish were meant for household consumption. By contrast, in the Oder river area, elements of large-scale team fishing equipment are much more numerous. In addition, local differences in the frequency of fishing gear found in the central and eastern parts of Podzamcze should not be overlooked.

Only a number of finds coming from layers dating back to the second part of the 11<sup>th</sup> – the beginning of the 12<sup>th</sup> centuries and the first half of the 13<sup>th</sup> century uncovered in Rynek Warzywny seem to confirm the presence of fishing at higher levels of organization involving a greater number of people. In the earlier period, the scale of fishing activity is evidenced by large clusters of bark floats and stone weights, including specimens bearing house marks. As a general rule, in the period when seine fishing equipment elements were found in abundance, individual fishing gear was missing from archaeological contexts in Rynek Warzywny. Surprisingly, in the case of strata dating from the close of the 11<sup>th</sup> century, a large number of objects used for team fishing is accompanied by a small amount of fish remains. In the archaeological contexts dated to this period uncovered in the eastern part of the town, only single objects used for individual fishing were found.

The first half of the 13<sup>th</sup> century is another period characterized by rich archaeological evidence connected with fishing. However, some significant changes consisting in the widespread introduction of floats made from rolls of birch bark, especially numerous in the eastern part of Podzamcze, and the appearance of weights made from baked clay, which had replaced specimens made of rock material, can be observed at that time. Also, a considerable decrease in the number of team fishing elements can be seen in the central part of the town. This tendency continued after the town was granted town laws. Therefore, a clear shift in the organization of fishing occurred: team fishing was moved from the central part of the town to the eastern Oder River quarter.

From the 12<sup>th</sup> century onward, particularly in the first part of the 13<sup>th</sup> century, a change in fish species preference was accompanied by further changes in the frequency and character of fishing equipment elements. The ‘barbarization’ of fishing gear, particularly seine equipment, may be associated with a change in the structure of fish species caught on a massive scale. A convincing piece of evidence regarding vimba fishing, confirmed by ichtiological remains analysis, is a fragment of a phloem fishing net,



a so-called trammel net, with large openings, most probably made from hemp fibres<sup>42</sup>.

In addition, some specialization in fishing activity can be observed. While large fish and seals were mostly caught in the first half of the 12<sup>th</sup> century, massive basic seine

fishing achieved a dominant position especially in the first half of the 13<sup>th</sup> century<sup>43</sup>.

*Translated by Zuzanna Poklewska-Parra*

### Streszczenie

#### Udział rybołówstwa w życiu gospodarczym średniowiecznego Szczecina z perspektywy archeologii.

W próbie odtworzenia sposobów organizacji i charakteru połowów, a tym samym określenia zmiennej roli rybołówstwa w dziejach gospodarczych miasta, zarówno w zakresie intensywności połowów, jak i struktury gatunkowej odławianych ryb, może być pomocna korelacja wniosków płynących z analizy sprzętu rybackiego i wyników badań ichtiologicznych. W przypadku średniowiecznego Szczecina rybołówstwo o „wyższym” stopniu organizacji, wymagające jednoczesnego zaangażowania większej liczby osób, poświadczają znaleziska z nawarstwień datowanych

na dwa okresy: 2. połowę XI – początek XII wieku oraz z 1. połowę XIII stulecia. Symptomatyczna wydaje się także „specjalizacja” w połowach na wielkie ryby lub foki w 1. połowie XII wieku. Od końca XII, a zwłaszcza w 1. połowie XIII wieku, wraz ze zmianą udziału preferowanych gatunków ryb, notuje się kolejne zmiany we frekwencji i charakterze elementów sprzętu rybackiego, odzwierciedlające najpewniej zmiany w systemie połowów. Okres po lokacji miasta cechuje ogólnie gwałtowny spadek frekwencji sprzętu do połowu ryb.

<sup>42</sup> The fishnet consists of a couple of parts: a net with large openings and a few nets with small openings. Fish entering the net through the large openings were entangled in the layers with a small mesh. The trammel net is a kind of basic seine net, which was most often stretched ‘from bank to bank’ across a watercourse. Cf.: M. Rulewicz, *Rybołówstwo Gdańska...*, p. 262; A.B. Kowalska, *op.cit.*, pp. 297-298.

<sup>43</sup> Cf.: A. Ropelewski, *Połowy ryb w polskiej strefie przybrzeżnej w ujęciu historycznym*, Gdynia 1996, p. 28. Some researchers believe that Szczecin, like Gdańsk, was a centre of sturgeon fishing and that part of the local fishermen specialized in catching this species. D. Makowiecki, *Historia ryb i rybołówstwa...*, p. 113. Ethnographical data suggests that sturgeons can be fished by means of basic seine and drift fishnets. However, two- and three-layer nets need to be deployed, which consequently results in capturing smaller fish. In Szczecin, characteristic, large, bony plates (scutes) lining the body of a sturgeon were uncovered in great numbers in layers dated to the second half of the 13<sup>th</sup> and the 14<sup>th</sup> centuries, where no projectile type tools, like fish spears and harpoons, were found. Similarly, no tools of this type were discovered in the so-called sturgeon fishermen’s house in Elbląg, where numerous fishbones of sturgeons were unearthed. M. Marcinkowski, *Dom poławiacza jesiotrów*, [in:] *Nie tylko archeologia*, eds. E. Cnotliwy, A. Janowski, K. Kowalski, S. Słowiński, Szczecin 2006, pp. 235-250.

