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WATER OBSTACLES AND THE MEANS TO CROSS THEM IN EARLY MEDIEVAL POLAND

The problem which every single military commander, merchant or other inhabitant of early medieval Poland had to seriously take into consideration was the necessity to efficiently cross numerous water obstacle in the form of lakes, rivers and, last but not least, marshlands¹. This situation, previously discussed in a number of written records, is also the subject of the present paper.

Of course, small rivers with hard river bottoms were forded. This technique could also be successfully applied in the case of large rivers, but only in carefully chosen places and when water flow was low. This was the way the army led by Bolesław I the Brave, after having carefully examined the existing fords, crossed the River Elbe during the invasion of the land of the Glomacze,² in 1003³. Similarly, the Polish cavalry forded the River Elbe while approaching the town of Meissen in 1010⁴. Five years later, the situation repeated itself during the fight in the vicinity of Strzała⁵.

A similar course of action was taken in 1018 on the banks of the Bug River, in the vicinity of the town of Wołyń, where the army of the Grand Duke of Kiev, resting in an army camp, was defeated due to a rapid crossing and a surprise attack launched by the victorious Polish forces commanded by Jarosław the Wise⁶. The above incident was

also described by Saint Nestor the Chronicler, who emphasised the spontaneous character of the raid carried out by Bolesław I the Brave's army and the resulting victory of the Poles over Jarosław the Wise's warriors⁷. This episode seems to be particularly interesting as a mention of bridges built in order to facilitate fording the river by the Polish army can be found in the account by Thietmar. However, it remains unclear whether the structures were completed or whether a convenient ford was discovered instead.

The importance of finding a ford during a war campaign is stressed by Gallus Anonymus in his account of the German campaign of 1109. Although Bolesław III the Wry-mouthed ordered that all the accessible fords on the Oder River be manned, his efforts failed as Henry V, Holy Roman Emperor, unexpectedly crossed the river near Głogów, in an unprotected and undefended place⁸. Another example of looking for a convenient ford in a river can be found in the Halych-Volhynia Codex, in its section devoted to the Tatar invasion of Poland in the winter of 1259/1260⁹.

A great number of shallow places, windings, shoals etc. suggests that finding a convenient ford was an easy task, particularly during summer when water flow was low, even if the opposite bank was defended by the enemy

¹ A. Nadolski, *Lądowa technika wojskowa od połowy X do połowy XII wieku*, [in:] *Polska technika wojskowa do 1500 roku*, ed. A. Nadolski, Warszawa 1994, pp. 81-82.

² The Glomacze tribe built their settlements between the middle River Elbe and the Mulde. The area inhabited by this tribe stretched down south till the Ore Mountains. Their main castles were Gana and Strzała, see: K. Wachowski, *Słowiańszczyzna zachodnia*, Poznań 1950, p. 119.

³ *Kronika Thietmara*, ed. M. Z. Jedlicki, Poznań 1953, V, 36, pp. 300-301: „Hic qualitatem vadorum secreto perquirens, mane facto ipse subsequitur...”.

⁴ *Ibidem*, VI, 55, pp. 391-392: ‘...et ecce priori die, quam Herimannus adventaret, magna Poleniorum caterva in primo diei crepusculo Albim transgressa usque ad portam civitatis sibi promissae silenter veniebat.’

⁵ *Ibidem*, VII, 23, pp. 500-501: ‘Miseco autem a patre nefario instructus, ut primo nostros abisse divisos nullamque post se custodiam esse relictam sensit Id. Septembris Albim iuxta urbem predictam cum VII legionibus in ipsa transcendit aurora...’.

⁶ *Ibidem*, VIII, 31, pp. 618-621: ‘Bolislau (...) Mense etenim Julio et XI Kal. Aug. predictus dux ad quendam fluvium veniens ibidem exercitum suimet castra metari pontesque necessarios

parare iubet (...). Ex hoc rumore Bolizlavus extollitur et consocios parari et accelerare rogans fluvium, etsi laboriose, velociter transcendit’.

⁷ *Powieść minionych lat*, ed. F. Sielicki, Wrocław 1968, p. 312: In the year 6526, Bolesław and Świętopełk together with their Lechites attacked Jarosław. Having gathered Rus and Varangian and Slavic troops, Jarosław approached Bolesław and Świętopełk and arrived in Volhynia and they were standing on both sides of the Bug River (...). Followed by his army, he mounted his horse and rode into the river, Jarosław had no time to get ready and Bolesław defeated Jarosław).

⁸ *Galli Anonymi Cronicae et Gesta ducum, sive principum Polonorum*, Monumenta Poloniae Historica, Nova Series, vol. 2, ed. K. Maleczyński, Kraków 1952, III, 4, p. 132: ‘Igitur inpiger (...) cum quibus potuit equitavit, et obstruere transitus et vada fluminis Odrae modus omnibus commendavit. Obstrusa sunt itaque loca quaecumque poterant vel sicco flumine transvadari, vel si que poterant ab ipsis incolis occulta fortisam attemptari’.

⁹ *Kroniki staroruskie*, ed. F. Sielicki, Warszawa 1987, p. 243: And Buranda was headed for Lublin, and from Lublin, he went to Zawichost and approached the Vistula River. There they found a ford and crossed the river to reach the other bank...).

(it may only be noted that the majority of military expeditions were held during the summer period). The problem could easily be conquered in wintertime, when all bodies of water and marshlands froze and could easily be walked on like bridges¹⁰.

However, if all the attempts to find a ford or any other shallow place failed and time mattered, swimming across the river was risked. According to Gallus Anonymus, such a hazardous attempt was made by Bolesław I the Brave, Duke of Poland, during a conflict with the Pomeranians, as a result of which many heavily armoured warriors drowned in the water and the army suffered heavy losses¹¹. In 1017, while crossing the Mulde, a similar attempt was made by the pagan Lucice tribe. It also ended in failure as 50 warriors drowned and an icon was lost¹².

Therefore it may be assumed that the risk involved in crossing a body of water in this way was considerably high. However, swimming across a water obstacle gave an army a definite tactical advantage over the enemy, namely taking the opposing side by surprise. This goal was achieved by Bolesław III the Wry-mouthed, Prince of Poland, during the fight for Kołobrzeg against the Pomeranians in 1103¹³. However, although the Parsęta River was successfully crossed, the stronghold of Kołobrzeg was never seized.

It may be assumed that in order to facilitate fording in places where the water was deep suitable technical means were applied. Rafts were improvised and boats gathered in a convenient place or built *ad hoc*, on the spot. One of the first mentions of using boats for crossing a river is not directly connected with the Polish lands. It can be found in an account by Theophylact Simocatta of Slavic-Avarian troops' fight against the Byzantine Empire in the 6th century¹⁴. In 1004, Henryk II, King of Germany, ordered that boats were built to mislead spies sent by Bolesław I the Brave about the planned route of his military expedition to Poland¹⁵.

A similar situation arose a year later, when German troops attacked the stronghold of Krosno upon Oder. Boats and bridges had been prepared but never used as a convenient ford was discovered at the eleventh hour¹⁶. Another example also comes from the Polish-German wars of the beginning of the 11th century. In 1015, a group of troops composed of Saxons and Veleti wanted to cross the river in sailing boats. However, successive attempts were thwarted by Polish troops commanded by Bolesław I the Brave positioned on the other bank. Finally, they hoisted the sails, kept sailing along the river all day long, misled the Polish guards and finally crossed the river¹⁷. It may only be added that the sailing boats described by Thietmar seem to have differed from the dugout as they functioned not only as ferries carrying people and goods from one bank to the other but could also be used for transportation of troops and equipment over long distances due to their displacement and stability.

Similar techniques were also applied by the Polish side if necessary. Boats are mentioned by Gallus Anonymus in his account of the battle of Nakło, fought by Bolesław III the Wry-mouthed, Duke of Poland, against the Pomeranians in 1113. During the fight, part of the troops from Mazovia used boats while the rest of the army swam across the river¹⁸.

Of course rivers were crossed not only during war campaigns or military expeditions. An account of Władysław I Herman, Duke of Poland's escape to the camp of Sieciech, a count palatine, is the best example here. The duke escaped by boat from his sons, Zbigniew and Bolesław's camp under cover of the night¹⁹. Further, a good account of using boats and suitable weather conditions for crossing a river can be found in Jan Długosz's (Johannes Longinus) work. The chronicler mentions that during an expedition of 1205 embarked on by Roman,

¹⁰ *Galli Anonymi...*, III, 24, p. 154: 'Illuc enim introiens, glacie lacuum et paludum pro ponte utebatur, quia nullus aditus alius in Wislam patriam nisi lacubus et paludibus invenitur'.

¹¹ *Galli Anonymi...*, I, 25, p. 51: 'Cumque ventum Essen ad fluviam, ultra quem turme gentilium residebant, non ponti veginisito vel vado loricati milites et armati sed profundo gurgiti se dedebant...'

¹² *Kronika Thietmara...*, VII, 64, p. 558-561: 'Et cum iuxta Vurcin civitatem Mildam nimis effusam transire voluissent, deam cum eregio L militum comitatu alteram perdidere'.

¹³ *Galli Anonymi...*, II, 28, p. 95: 'Die sabbato, Aurora lucescente, ad urbem Cholberg propinquantes, fluviumque proximum sine ponte vel vado, ne praescientur a poganis, cum periculo transeuntes, aqiunibus ordinatis...'

¹⁴ *Greckie i lacińskie źródła do najstarszych dziejów Słowian*, cz. I (do VIII w.), ed. M. Pezia, Poznań-Kraków, 1952, pp. 101-102.

¹⁵ *Kronika Thietmara...*, VI, 10, pp. 328-329: 'Assimulato namque in Poleniam itinere, nawes Boruz et Nisani glomerantur, ut ficta suorum benivolentia non fieret inimico circumeundi pro palatio ulla'.

¹⁶ *Ibidem*, VI, 26, pp. 350-353: 'Quos Bolizlavus, munitis littoribus prefati fluminis cum exercitu grandi in Crosno sedens, ullo modo transire prohibuit. Sed cum rex VII dies ibidem moratus naves atque pontes pararet, divinus respectus missis speculatoribus suis vadum ostendit optimum. Quem VI legiones in ipso diei crepusculo iussu regis intrantes, incolumes eo fruuntur'.

¹⁷ *Ibidem*, VII, 19, pp. 494-495: 'Quocumque nostri in navibus declinabant, illuc ipse cum suis quo sequebatur alato. Ad ultimum vero erectis celeriter velis, nostri per omnem unam navigabant diem et, inimicis eos tunc comitari non valentibus...'; see: A. Nadolski, *Polskie siły zbrojne w czasach Bolesława Chrobrego*, Łódź 1956, p. 58, and note 73.

¹⁸ *Galli Anonymi...*, III, 26, p. 162: 'Ubi vero ventum est ad fluvium, qui iunctus Wisle flumini, castellum illud in ampulo situm flaviorum ab eis ex altera parte dividebat, alli fluvium illum cursim, alius ante alium transnabant, alii vero Mazoviensium per Wislam fluvium navigo veniebant'.

¹⁹ *Galli Anonymi...*, II, 16, p. 83: 'Quem dum persequi et extra terram expellere conarentur, ipse dux noctu (...) exercitum latenter exiens, ad Zatheum ex altera parte Wysle fluminis cum navicula transmeavit'.

Duke of Halych, against Polish dukes, the army crossed the Vistula River near Zawichost²⁰.

Therefore, boats were in widespread use in the Early Middle Ages and served both as a means of transportation and a means of crossing water obstacles. They ensured more safety than fording or swimming across a river. However, they were not fully reliable either, as they would frequently sink drowning the people on board. Strong water currents and the enemy gunfire were among the most common risks and hazards involved.

Conditions permitting bridges were erected. As was stated above, for instance, a bridge was built by Polish troops across the Bug River in 1018. The situation was especially difficult as the enemy army were defending themselves on the opposite bank. The bridges constructed by German troops in 1005 have already been mentioned. Abraham ben Jacob, an Arab merchant and traveller living in the second half of the 10th century, describes quite a few bridges built by Slavic peoples. In his account, the author writes about a mile-long wooden bridge, which he had seen in the Slavic lands²¹, which might suggest that Slavic builders were well familiar with suitable construction techniques. Undoubtedly, in the Early Middle Ages, building or repairing a bridge did not require great effort, much time or energy. Jan Długosz's account of Conrad III of Germany's expedition of 1146 to Poland seems to support this assumption. He was lavishly received as an honoured guest by the contemporary duke of Poland, Bolesław IV the Curly, who ordered that bridges and difficult fords were repaired in rivers in all parts of the country on the occasion of this visit²². However, a bridge did not always guarantee a safe crossing. The inhabitants of Sandomierz learned their painful lesson during the siege of the town by Tatar troops in the winter of 1259/1260. The people, who panicked at the sight of wild pagan hordes, rushed towards the bridge over the moat, which proved too narrow for them. So many men and women suffocated or were pushed into the water that the deep moat filled up with dead bodies²³.

Written records referring to Western Pomerania are the most abundant source of information about bridges, bridge building and their applications. This is a result of the fact that from the 12th century onwards, the region remained

the centre of attention for the rulers of the East German March (Mark) and the Danish state, whose armies fought fiercely against the Pomeranians. These incidents were frequently recorded in contemporary chronicles, including the so-called Life of Saint Otto of Bamberg, containing a description of the Christianisation of Pomerania, undertaken on the initiative of Bolesław III the Wry-mouthed, Duke of Poland, in 1124, and 'Gesta Danorum' by a Danish chronicler known as Saxo the Grammarian, dealing with the conquest of Western Pomerania by two Danish kings, Valdemar I of Denmark and Canute V of Denmark, in the second half of the 12th century.

One of the most interesting mentions is an account by Saxo the Grammarian of the fight of 1170 for Wolin between Pomeranian and Danish troops. The Danish army, commanded by King Valdemar I, attempted to sail across the river connecting Kamień and Wolin. They were, however, hindered by a long bridge and the Danes had to bypass the structure on the southern side to demolish it. The Pomeranians tried to stop them but their attacks were fended off²⁴.

It remains unclear what the chronicler had in mind when he mentioned some secret doors in the bridge. These might have been a type of gate that could be opened, but, particularly from a distance, they looked as if they were elements of the supporting structure of the bridge. Such 'gates' could be opened to allow boats without masts (the Pomeranian army was most probably equipped with boats of this type) to pass and go upstream or downstream so that the vessels did not have to be pulled out of the water and carried by land onto the other side of the bridge. In Saxo's account, the function of the bridge as an obstacle against the navy appears to be superior to its fundamental transportation function. In addition, the chronicler provides details about the ways of adjusting existing bridges for defensive purposes by strengthening them with additional structures, most probably a type of weir, which were to prevent vessels from reaching the bridge itself. In order to more precisely assess the size of the bridge construction in question, the exact position of the structure has to be

²⁰ *Joannis Długossi Annales seu Cronicae incliti Regni Poloniae*, liber V et VI, Warszawa 1973, p. 194: 'Ad fluvium quoque Vislam perveniens partim illum navibus et limbis, partim vadis in aliquod locis repertis siccitate estates illius diminutis...'

²¹ *Relacja Ibrahima ibn Jakuba z podróży do krajów słowiańskich w przekazie Al. Bekriego*, Monumenta Poloniae Historica, Nova Series, vol. 1, ed. T. Kowalski, Kraków 1947, p. 48.

²² *Joannis Długossi Annales...*, liber V et VI, p. 41: 'subministravit et in honorem Cesaris pontes in fluminibus transittusque difficiles munivit...'

²³ *Kroniki staroruskie...*, p. 244.

²⁴ *Ex Saxonis Gestis Danorum*, ed. G. Waitz, Monumenta Germaniae Historica, Scriptorum, vol. 29, Hannover 1882, p. 133: '[Waldemarus] ad fluvium Iulino Caminoque iunctum regia classe progreditur. Cuius navigationem crebra saepium obstacula a piscatoribus defixa difficilem faciebant. Pons quoque praelongus, Iulini moenibus contiguus media amnis intercisione transitionem coartabat, citra quem, impedimentis arcentibus, pernoctatum est. Mane rex continentem aggressus ex adverso urbis in ripa australi pontem disieci iussit; nec minori Syalandensibus piccatorias saepes convellere stadio fuit. Quos cum Iulinenses per occultum pontis transitum cymibis prolapsi, propellere niterentur, Absalon (...) opportunum iis praesidium atulit. (...) Repulsis hostibus ingentique pontis parte convulsa, ceterae classi navigandi inter tributur'; see: R. Kiersnowski, *Budownictwo zachodnio-pomorskie wieku XII w świetle źródeł pisanych*, "Wiadomości Archeologiczne", vol. 19/2-3, 1953, p. 122.

established. The bridge is known to have been built in the area adjacent to St Adalbert's Church²⁵.

After the defeat, Pomeranians started rebuilding the bridge without delay, but the works were completed by Valdemar I only after his return from Kamień. Saxo's account is unclear in this respect. However, it may be assumed that the reconstruction took place after the king's fleet had returned from the Dziwna River to the Szczecin Lagoon²⁶.

Most probably, the same bridge appeared in Herbord's description a half century earlier. It was destroyed by missionaries sent by Bolesław III the Wry-mouthed, running away from pagan Pomeranians²⁷. The laconic mention seems to suggest that, in 1124, the structure was demolished in a hurry in order to prevent the chasing enemy units. Only the bridge flooring was destroyed. In 1170, though, the longitudinal construction elements had to be removed in order to allow the fleet to pass so that Danish boats, equipped with masts and rigging, which took part in the expedition could sail upstream. This is the reason why the reconstruction mentioned by Saxo the Grammarian required so much effort.

An account by Peter of Dusburg of the fight near the stronghold of Świecie upon Wisła, which took place at the beginning of 1245, provides some interesting material about the destruction and the following reconstruction of a bridge. On hearing the news about construction works at this stronghold, conducted by order of Świętopełk, Duke of Gdańsk and Kujawy (Kuyavia), Teutonic troops together with Kazimierz Kondratowicz, Duke of Mazovia, who were fighting against Świętopełk, were headed for the stronghold. A navy unit sent from Chełmno beforehand was to prevent Pomeranian troops from building the fortifications until the main forces arrived. According to the priest-brother's chronicle, on seeing the fleet approach the stronghold, Świętopełk ordered that the bridge, providing access to the fortress, be destroyed and his troops withdrawn. However, when the duke realized that the Mazovian knights and the Teutonic unit had difficulty crossing the Vistula River because of its fast current and numerous backwaters, he returned and after repairing the bridge,

reinforced the stronghold crew by dispatching 300 warriors from his army²⁸.

Another interesting way of using a bridge for defensive purposes is to be found in Saxo the Grammarian's account of the fight for Kamień, which took place during the above-mentioned expedition of 1170. During the siege, a battle was fought between Danish troops and Pomeranian units, where part of the Pomeranians would hide themselves under the bridge to injure Danish warriors with their spears, sticking through holes in the bridge flooring²⁹. Most probably, the bridge mentioned in this description is the structure over the mouth of the Niemica River, north-east of the stronghold of Kamień. This bridge, well known as the place of customs collection in the 13th century, seems to have performed an important transportation function as early as the second half of the 12th century. Therefore, it must have been adjusted for the transportation of goods. The bridge itself as well as the dyke erected on both sides were particularly important as they constituted the only route through the marshlands of the Niemica valley and the Danish troops had to use the bridge to reach the town. However, the role played by the fleet remains unclear. It must have backed up the Danish army from the river.

Similar doubts arise over the bridge in Wołogoszcz. The location of this bridge exceeds the scope of the present article. However, three mentions regarding its construction and history deserve special attention. Two passages from Saxo the Grammarian's work contain information about the bridge in question as a defence against Danish troops. By contrast, according to another extract, the bridge was pulled down by the town's inhabitants themselves in order to prevent the enemy from reaching the stronghold. Therefore, it seems reasonable to assume that the chronicler mentions two different structures. The first two mentions refer to a bridge over the Piana River itself while the third one to a kind of jetty leading to the town. Let us examine the source material in detail. The first mention refers to a situation where the Danish fleet, sailing along the Piana

²⁵ The location of the bridge was established due to archaeological investigations conducted by Władysław Filipowiak in the years 1953-1954, see: W. Filipowiak, *Wolinianie. Studium osadnicze*, part I, *Materiały*, Szczecin 1962, p. 300.

²⁶ *Ex Saxonis...*, XIV, p. 134: 'Bogiszlavus, circa pontis refectionem ineundae urbis studio occupatus, conspectis Danis, operam fuga mutavit (...). At rex, confestim refecto ponte, tamquam hostium operam consummaturus, in australem ripam equites traiecit...'; see: R. Kiersnowski, *op. cit.*, p. 123.

²⁷ *Herbordi vita Ottonis episcopi babenbergensis*, Monumenta Poloniae Historia, vol. 2, ed. K. Maleczyński, Kraków 1961, II, p. 87: 'Abeuntes ergo trans lacum, disiecto ponte a tergo nostro, ne [lulinenses] iterum impetum super nos facerent (...) respiravimus...'; see: R. Kiersnowski, *op. cit.*, p. 123.

²⁸ *Perti de Dusburg, Chronicon terrae Prussiae*, Scriptores Rerum Prussicarum, vol. I, ed. M. Toeppen, Leipzig 1861, III, 46, pp. 77-78: 'Swantepolcus, videns naves fratrum adlitus aplicari, sublatis teutoniis pontem, per quem aditus ad castrum patuit, dejecit et fugit. Tandem retrospecti videnesque, quod fratres equites cum suo exercitu non posset convenire ad eos, qui de colmine navigio descenderant, propter profunditatem fluminis, quod fuit medium inter eos, resumpta audacia cum suis rediit, et dum videret magistrum se ad impugnationem castris inclinare, refecto celeriter ponte, misit CCC viros ad castrum, ut defenderent.'

²⁹ *Ex Saxonis...*, XIV, p. 133: '[Rex] ad urbem Caminum, permeato amne proceditur. Cuius septentrionali provincia armis incendioque vastata, proelium eius in ponte conseritur. Sub quem Sclavi per occulta vada repetens, lancies inter rimas porrectis, furtim nostros vulneribus appetebant. Cuius incommodi fraudem Danicarum illico scapharum frequentia dispulit. Pontis quoque fragilitas, excidium minitans, amplius quam hostis saevitia in metu reponebatur'; see: R. Kiersnowski, *op. cit.*, p. 124.

River, arrived at the obstacle, demolished the bridge and approached the ramparts³⁰. Thus, in this case, the bridge not only performed a purely transportation function but also played a defensive role against the enemy, namely the Danish fleet, like the above-mentioned bridge near Wolin in 1170. The second mention contains information about warding off an attack launched by the Danish fleet. Here the bridge served as a kind of protection from behind of which Pomeranian warriors attacked the enemy from small boats³¹.

However, the third mention seems to be the most interesting. During the fight, the inhabitants of Wologoszcz started to gradually demolish, a small jetty over the moat leading to the stronghold. The materials obtained were needed to build improvised ladders, which were subsequently used for reaching the stronghold gate³².

In early medieval records, the term *pons* denotes both bridges and jetties of all kinds, as well as roads with wooden flooring. Suitable technical means were also needed whenever a sippy area had to be crossed. Bogs could sometimes be more difficult to cross than a large river. The only way to cross a strip of marshland was to build a road made of fascines or timbers. Such structures, built by Slavs, namely the Rani (Rujani), who supported Canute VI and backed up his army, are also mentioned in Saxo the Grammarian's work³³. It is difficult to say whether Rani were ordered to build the structures by Canute VI because they were good at building roads over marshlands or because the king simply burdened his Slavic ally with the hardest task, which seems far more probable.

A similar instance of crossing a bog can be found in the final stage of the Polish-German war of 1015. When the emperor's forces were forced to withdraw, improvised roads were built over marshland from wood and branches, which made it possible for the Germans to leave the Polish army behind³⁴. It may be assumed that Polish people possessed similar skills.

³⁰ *Ex Saxonis...*, XV, p. 149: 'Intera classis per Penum amnem allapsa (...) Wologastum progreditur. Cuius ponte disiecto transituque obstaculis vacuefacto, propter moenia ancoras iacit...'; see: R. Kiersnowski, *op. cit.*, p. 124.

³¹ *Ex Saxonis...*, XVI, p. 125: "Igitur cum exercitus noster (...) exhauriendae provinciae consilium cepisset inique pontis pertranseundi angustiis haerent, crebris oppidanorum myoparionibus incessuntur..."; see: R. Kiersnowski, *op. cit.*, p. 125.

³² *Ex Saxonis...*, XIV, p. 148: "Wologastenses Zulistro duce extremam pontis sui partem convellere coeperunt, ne quis hostium per eum irrumperet, inhiberi. Cuius fragmentis pauci ex nostris perinde ac scalis utentes, adminiculantibus sociis ascensu obtento, hostium urbe exsiliuntium irruptione petuntur", see: R. Kiersnowski, *op. cit.*, p. 125.

³³ *Ex Saxonis...*, XIV, p. 159: "[Rex] propter Lubynam pernoctatione habita, deletis vicorum reliquiis, lacunam, per quam arduo labore iter fecerat, ponte a Rugianis consterni curat..."; see: R. Kiersnowski, *op. cit.*, p. 125.

³⁴ *Kronika Thietmara...*, VII, 20, pp. 496-499: 'Insuper abbatem suum Tuni nomine simulata pace ad caesarem misit, qui

The last important mention refers to Wolin. During a Christianization mission, Bishop Otto of Bamberg ordered that a boggy depression be dried up, soil shipped in and a dyke built in the place where a pagan temple stood and the river was liable to overflow. The dyke connected the settlement with the stronghold. Due to this undertaking the bishop gained the respect of local people.³⁵ The fact that the area could so easily be dried up and a dyke constructed to become an object of admiration for the local community seems to suggest that the Pomeranians were not particularly inventive in respect of building technology.

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In the light of the material collected, a few tentative conclusions can be drawn. Undoubtedly, the simplest method of crossing a river was to find a convenient ford or swim across the obstacle. However, if a war expedition was well prepared and the army had suitable equipment at their disposal, all types of water obstacles could be crossed by boat. Boats could be carried by the army or simply made on the spot whenever an obstacle was encountered. The latter method eliminated delays connected with the necessity to transport ready made boats through thick forests and along Polish roads, which were uneasy to travel. Besides, marshlands and bogs could be crossed by building jetties made from timber and branches. This method was usually employed in situations where the army was not in a hurry or where there was no need to use the structure again, that is, on the way back or repeatedly. Another technique applied was building a dyke. This was the most time-consuming solution, requiring more work and effort. Therefore, it was usually employed whenever a permanent road connection across a sippy area was needed, for example, a reusable structure connecting a settlement to a stronghold. Finally, building a bridge was a convenient way of crossing water obstacles. The material gathered suggests that contemporary bridges were wooden structures. They were narrow (e.g. Sandomierz), carelessly built (e.g. Kamień Pomorski) and not particularly solid in construction (the Wolin bridge mentioned in the relation of 1124). Not requiring special care in detailing, early medieval bridges were quick and relatively easy to build.

protinus ab eo explorator esse cognoscitur et ibidem, quousque omnis pene exercitus factis in precedenti nocte pontibus paludem transenderet preiacentem, detinetur'.

³⁵ *Sancti Ottonis Episcopi Bababergensis vita Priestligensis*, Monumenta Poloniae Historia, Nova Series, vol. 7/1, ed. J. Wikarniak, Warszawa 1966, p. 137-138: 'Ubi (...) contina sita erat, fluvius redundans paludem fecerat et iam undique circumfluentibus aquis una tantum in parte per eam ponte porrecto, fanum illud adiri poterat (...). Iam vero palude cum summa ut diximus omnium admiratione siccata, eam quam crebra a quarum illuvies fecerat, aggere comportato suppelri foream fecit moxque oratorium ibi in honore beati Adalberti constituens beatum illi Georium collegam ascivit'.

Streszczenie**Przeszkody wodne i ich pokonywanie we wczesnośredniowiecznej Polsce**

Najprostszym sposobem przekraczania rzek było wyszukanie dogodnego brodu lub przepłynięcie ich w pław. Postępowano tak zarówno w przypadku rzek małych, jak i większych, ale tylko w odpowiednio wybranych miejscach i przy niskim stanie wody. Tak uczyniły wojska Bolesława Chrobrego 1003 i 1010 r. oraz niemieckie w 1109 r. Rzadziej ryzykowano przeprawę w pław. Gdy działania wojenne były dobrze przygotowane, to wtedy do pokonywania przeszkód wodnych stosowano łodzie. Można je było transportować ze sobą lub wykonać już na miejscu. W działaniach wojennych zastosowali je Niemcy w 1004 i 1005 r. pod Krosnem nad Odrą. Z łodzi korzystał też książę Władysław

Herman uciekając do obozu palatyna Sieciecha. Przez bagna i moczary najłatwiej było się przedostać układając pomost z drewna i gałęzi. Metodę taką stosowano głównie w przypadkach, gdy przepływającym się zależało na czasie, jak to miało miejsce podczas wojny polsko-niemieckiej w 1015 r. Ostatnim wreszcie sposobem przekraczania przeszkód wodnych była budowa drewnianych mostów. Ówczesne były to konstrukcje wąskie (np. Sandomierz), najczęściej nie grzeszyły dokładnością czy też solidnością konstrukcji (Kamień Pomorski, Wolin), ale stanowiły przeważnie szybki i stosunkowo prosty w budowie obiekt.