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## REMAINS OF FISH AND BIRDS FROM DUBNO CASTLE (16<sup>TH</sup> CENTURY, RIVNE REGION, UKRAINE)

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Results of the study of bird and fish remains which were found during the excavations of 16<sup>th</sup> century layers in Dubno castle (Rivne region, Ukraine) are presented in this paper. These remains are belonging to four fish species (perch, pike, roach, indeterminate carp fish) and eight bird taxa (mallard, northern shoveler, capercaillie, black grouse, partridge, pigeon (possibly stock dove), chicken, goose (possible domestic)). The role of birds in life of people has changed at that time as it was shown after the comparison of obtained data with those from earlier archaeological sites. A poultry proportion was growing. Unlike inhabitants of the Middle Ages who hunted birds mainly during the migration season, people from Dubno castle could do it during nesting season. Analysis of remains of fish and waterfowl from Dubno castle indicates that ponds with large open stretches as well as overgrown beaches, were here in the 16th century. It is established that people have kept poultry in Dubno castle at that time. Domestic chickens have had smaller size as compared to extant outbreed chickens and were close to those in medieval chickens.

**Keywords:** fishery, poultry, early modern period, Constantine Ostrogski.

### INTRODUCTION

A number of publications devoted to the study of animal remains from archaeological localities in Ukraine is relatively small. Most of them are focused on mammals found in layers of different age, inclusively with the Middle Ages. Time after the Mongol invasion is actually not represented in Ukrainian zooarchaeological publications, however is of substantial interest. During the Middle Ages hunting played a significant role in life of people inhabiting the current territory Ukraine [10], and it often had affinity to certain seasons [9].

There is a reason to believe that the current situation where the main basis of meat products income was stock breeding, and hunting was only for fun, was formed after the

Middle Ages. Our work is not just a description of animals from one locality – it is the first where remains of birds from the post-medieval layers of Ukraine were analyzed and one of the first where fish of those times from Ukraine is described.

Concerning the time of construction Dubno castle by princes Ostrogski, there is a credible royal evidence, dated to 1507 about the building of a castle by Prince Constantine Ostrogski. This document was associated with petition for obtaining of urban rights for settlement in 1498 [1]. Ancient coastal slope of the Ikva River was excavated during the July-September 2015. It is observed the presence of cultural layers, dated to Ancient Rus and Lithuanian-Polish dominion. The latter layer (16<sup>th</sup> century) is a light brown soil with inclusion of large fragments of brick, dishes, tiles and glass. The mellow light grey soil with remains is replaced by brown soil in the top of the slope to a depth of 2.2 m. Numerous bones of mammals and birds, as well as fish remains, window glass, iron products are derived from this layer. Lack of materials, later than the beginning of the 17<sup>th</sup> century, indicates the termination in use of this cesspit. The analysis of such material is able to illustrate the everyday aspects of life of prince and his family. It is also helps to shed light upon some distinctive cuisine features of the Ruthenian gentry elite in the 16<sup>th</sup> century.

## MATERIAL AND METHODS

Total 317 remains from Dubno castle were processed, including 25 fish bones and about 180 scaly plates (Table 1), as well as 112 bird bones (Table 2). Bones of extant fish and birds from collection of the Department of Paleontology (National Museum of Natural History, National Academy of Sciences of Ukraine) and Zoological Museum (Taras Shevchenko National University of Kyiv) were used for comparison. Additionally we use a special literature [16] for determination of birds belonging to order Galliformes.

Some remains among the processed bones are almost impossible to identify clearly (e.g., domestic duck / *Anas platyrhynchos*, domestic goose / *Anser anser*, as well as *Columba livia*/*Columba oenas*). Since there are no accurate morphological features, we have to focus on the size, which, of course, can have overlap. We have a certain number of specimens of all these species in comparative collection, but their sample is not to large. That is why we decided to use the Mann-Whitney U-test, which can detect owned whether two small samples (in our case – wild and domesticated forms) to two independent samples or they belong to one general sample.  $U_{\text{empirical}}$  and  $U_{\text{critical}}$  were counted for each pair of investigated samples. If  $U_{\text{empirical}}$  was less than or equal to  $U_{\text{critical}}$ , we consider that these are two independent samples. If  $U_{\text{empirical}}$  was more than  $U_{\text{critical}}$ , we believe that these are two parts of one general sample. It should be noted that overlapping of measurements has been found in all analyzed extant remains. This is because the Mann-Whitney U-test, as any method of statistical analysis, has some error. We have count at  $p \leq 0.05$ , so even in the case of reliable allocation there is a little chance (5 %) that it is still one general sample. Mann-Whitney U-test was used to compare measurements of chickens from Dubno castle with extant and medieval ones. Each pair of samples will be described in detail separately. Measurements carried out after von den Driesch [5].

One bone (half right proximal humerus), undoubtedly belonging to the genus *Columba*, was found in materials from Dubno. Nowadays there are three species of this genus in the Ukrainian avifauna: wood pigeon (*Columba palumbus*), stock dove (*Columba oenas*) and rock dove (*Columba livia*). Moreover, wild rock dove is found only in the Crimean Mountains [6]. Only these three species are known from the Holocene

of Ukraine [3]. The bone from Dubno is far smaller than those in the wood pigeon, so it is stock dove or rock dove. Available measurements of this bone: proximal diagonal of humerus (16.7 mm) and smallest breadth of the corpus (5.3 mm). Such size is more common to extant stock dove, but it is also marked for the rock dove (Table 3). Although the large overlap is visually observed, statistical analysis distinguishes two samples as belonging to separate species; however, these results are on the verge of acceptable error. Probably this bone from Dubno has belonged to the stock dove.

Measurements of ulna and tarsometatarsus among the remains of ducks from Dubno, available for the study, are the following: breadth of the proximal end; diagonal of distal end; smallest breadth of the corpus, as well as greatest length; breadth of the proximal end; breadth of the distal end; smallest breadth of the corpus, respectively. The analysis of these parameters (Table 4) in extant *Anas platyrhynchos* (wild form) and *Anas platyrhynchos* f. *domestica* (outbred) showed that both modern forms differ in all parameters of ulna and some parameters of tarsometatarsus (i.e., breadth of the distal end and smallest breadth of the corpus). Of course, extant domestic duck is larger than those in the past. Remains of ducks from ancient times in Ukraine did not differ in size [3], although some researchers distinguish them [18]. However, domestic ducks in Ukraine are beginning to differ in larger size from the wild ones since the Middle Ages. [3]. Since we are working with late medieval material, we believe that we can focus on the size. Bones of ducks from Dubno are placed in the dimensional range of wild *Anas platyrhynchos* (Table 5). Moreover, this species is not rare and extremely numerous. Nowadays, it is the most numerous waterfowl bird and probably was one of the most popular game bird in the past.

We could not detect features or indicators for distinguishing the gray goose from domestic one, so the remains of geese in the Table 5 are presented as *Anser anser*/*Anser anser* f. *domestica*. But more likely it is poultry (or at least most of remains are belonged to poultry). Grey goose nests sometimes in Polesie, but it is not so numerous species. If these birds were obtained during the migration period then could be other geese. Such situation is, for example, in the medieval village Stadnyky, located about 50 km from Dubno, and has approximately the same sample (125 bones): except remains of the gray goose, remains of the bean goose, greater white-fronted goose and lesser white-fronted goose were found there [8]. Therefore, we assume that geese from Dubno castle were likely domestic.

Tubular bones of adult birds were examined for the presence of medullary tissue. It is easily recognizable (Fig. 1) in the bones. Medullary tissue appears in females during the breeding season [15].

## RESULTS AND DISCUSSION

Species richness of fish on materials from Dubno castle is insignificant (Table 1). It is possible to establish the existence of the following fish species: pikeperch *Sander lucioperca* (Linnaeus, 1758), northern pike *Esox lucius* Linnaeus, 1758, common roach *Rutilus rutilus* (Linnaeus, 1758), as well as some carp fish (Cyprinidae gen. et sp. indet.). In comparison, six species, including sturgeon, catfish and pontic roach were found in the 16<sup>th</sup> century layers of Rakochi castle (Khmelnitskyi region) [12]. A single bone of pikeperch from Dubno is relatively big (dentary length 72 mm, symphyseal height – 12 mm). Remains of the roach and pike belong to small individuals (body size for pikes is 40–45 cm, so they were juvenile or subadult).

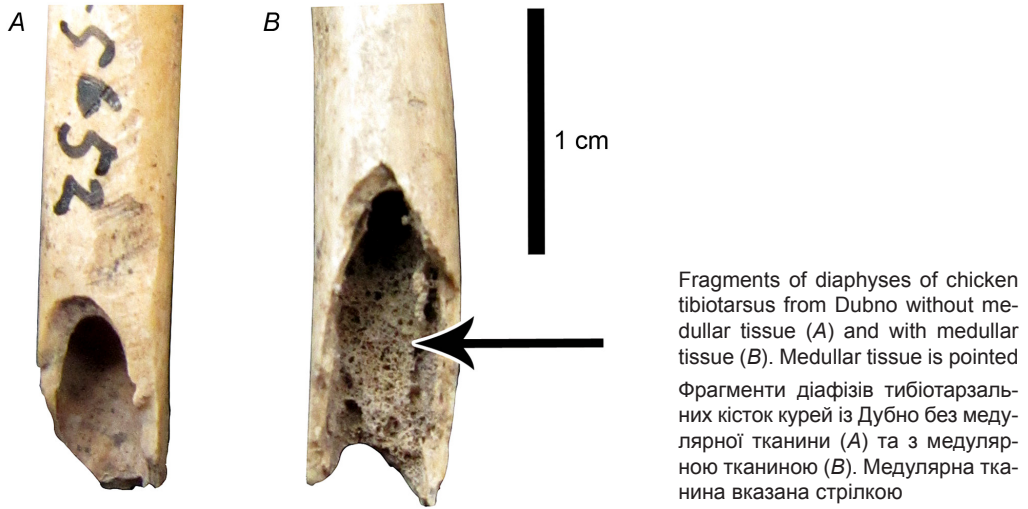


Table 1. Species composition of fish from Dubno castle

Таблиця 1. Видовий склад риб із Дубенського замку

Skeletal elements	<i>Rutilus rutilus</i>	Cyprinidae gen. et sp. indet.	<i>Esox lucius</i>	<i>Sander lucioperca</i>
<b>Number of identifiable specimens</b>	1	6	15	166
Dentary	–	–	7	1
Articular	–	–	1	–
Preopercular	–	–	–	2
Pharyngeal bone	1	–	–	–
Centra	–	4	7	–
Fragments of ribs	–	2	–	–
Scaly plates	–	–	–	163

The results of determination of bird remains (Table 2) indicate that the inhabitants of Dubno castle preferred to eat poultry – total share of these birds is 54 or 68 % of the minimum number of species (it depends on whether the geese were domestic or wild). This result differs from data obtained during the excavations of older (i.e., medieval) settlements in Ukraine [10], but close to those in Rzeczpospolita Polska (13–14<sup>th</sup> and 15–16<sup>th</sup> centuries) [14].

Sometimes, there were controversial data allegedly the remains of poultry in medieval settlements of Ukraine prevailed over wild [3, 18]. But this is due to an error in the calculations. In such cases these researchers counted the percentage of poultry in all localities, including those where were only a few bird bones. Of course, these were usually domestic chickens and their proportion was close to 100 %. Then arithmetic average was counted for all localities. If we analyze only medieval localities with a large sample of bird bones ( $N \geq 100$ ), the proportion of poultry is less than 50 % [10].

A large proportion of poultry indicates a change the role of birds in the life of people – importance of poultry increased while the importance of hunting birds is reduced. Perhaps this trend was brought to Ukraine by new owners of the castle, which were oriented

Table 2. Species composition of birds from Dubno castle

Таблиця 2. Видовий склад птахів із Дубенського замку

Bones		<i>Anser anser / A. a. f. domestica</i>	<i>Anas platyrhynchos</i>	<i>Anas clypeata</i>	<i>Columba oenas / Columba livia</i>	<i>Tetrao urogallus</i>	<i>Lururus tetrix</i>	<i>Perdix perdix</i>	<i>Gallus gallus f. domestica</i>
<b>Number of identifiable specimens</b>		<b>22</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>77</b>
<b>Minimum number of individuals</b>		<b>4</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>15</b>
<b>Frequency of adult individuals, %</b>		<b>75</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>62</b>
<b>Frequency of individuals with medullar tissue (only adult individuals), %</b>		<b>25</b>	<b>33</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>65</b>
cranium	total	1	–	–	–	–	–	–	5
	juvenile	–	–	–	–	–	–	–	–
sternum	total	–	–	–	–	–	–	–	–
	juvenile	–	–	–	–	–	–	–	–
coracoideum	total	1	–	–	–	–	–	–	6
	juvenile	–	–	–	–	–	–	–	1
	remains with medullar tissue	–	–	–	–	–	–	–	1
furcula	total	1	–	–	–	–	–	–	2
	juvenile	–	–	–	–	–	–	–	–
humerus	total	3	–	–	–	–	1	–	7
	juvenile	–	–	–	–	–	–	–	–
	remains with medullar tissue	–	–	–	–	–	–	–	2
ulna	total	2	3	1	–	–	–	–	8
	juvenile	–	–	–	–	–	–	–	2
	remains with medullar tissue	–	1	–	–	–	–	–	–
radius	total	6	–	–	1	1	–	1	3
	juvenile	1	–	–	–	–	–	–	–
	remains with medullar tissue	–	–	–	–	–	–	–	–
carpo- metacarpus	total	1	–	–	–	–	–	–	2
	juvenile	–	–	–	–	–	–	–	–
	remains with medullar tissue	1	–	–	–	–	–	–	1
synsacrum	total	1	–	–	–	–	–	–	–
	juvenile	–	–	–	–	–	–	–	–
femur	total	1	–	–	–	–	–	–	10
	juvenile	1	–	–	–	–	–	–	1
	remains with medullar tissue	–	–	–	–	–	–	–	5
tibiotarsus	total	4	–	–	–	–	–	1	14
	juvenile	–	–	–	–	–	–	–	2
	remains with medullar tissue	1	–	–	–	–	–	1	6
tarso- metatarsus	total	1	2	–	–	–	2	–	20
	juvenile	1	–	–	–	–	–	–	3
	remains with medullar tissue	–	–	–	–	–	–	–	11

towards traditions of West Slavs. An interesting feature of Dubno settlement is a large proportion of bird skulls (three chicken skulls, i.e. 20 % of all remains of chickens, and one domestic goose, i.e. 25 % of geese individuals (perhaps domestic)). The most probable explanation is that birds were slaughtered directly in the castle. This assumption is evidenced by the high proportion of young chickens (38 % of minimum number of individuals). The presence of young birds indicates that chickens have bred in place rather than have bought somewhere [17]. 87 % of processed chicken bones have medullary tissue, i.e. these are remains belonging to oviparous females [15]. Inhabitants of Dubno castle have not experienced shortages in food, if they used such birds for food and afford to ignore the ability of these chickens to lay eggs.

For measurements of chicken bones the following parameters were selected: (1) breadth of the distal end of humerus; (2) greatest length breadth of the distal and proximal end of femur; (3) breadth of the distal end of tibiotarsus [5]. Measurements and their comparison with other chickens are shown in Table 6. Average body size of chickens from the late medieval Dubno is less than in extant outbred ones and chickens from the earliest late medieval settlements of East Slavs. Although most of samples are small and cannot present normal distribution, so the average value is not significant. Analysis of the Mann-Whitney U-test shows that chickens from Dubno are significantly smaller as

Table 3. Comparison of size of humerus in extant rock dove (*Columba livia*) and stock dove (*Columba oenas*)

Таблиця 3. Порівняння розмірів плечової кістки сучасного голуба сизого (*Columba livia*) та голуба-синяка (*Columba oenas*)

		Proximal diagonal of humerus			Smallest breadth of the corpus								
		Stock dove		Rock dove (wild)	Rock dove (wild + domestic)		Stock dove		Rock dove (wild)	Rock dove (wild + domestic)			
Measurements (mm)		16.5	17.7	15.6	16.8	14.8	16.3	5.2	5.6	5.1	5.2	4.9	5.2
		16.9	17.7	16.3	17.3	15.0	16.4	5.2	5.7	5.1	5.3	5.0	5.2
		17.6		16.4	17.4	15.2	16.6	5.4		5.1	5.3	5.0	5.3
						15.6	16.9					5.1	5.3
						16.1	17.2					5.1	5.3
						16.2	19.1					5.1	5.3
						16.3						5.1	5.4
												5.1	5.4
												5.1	5.4
												5.1	6.1
											5.2		
U-test Stock dove and Rock dove (wild)	$U_{\text{empirical}}$	5			–		5			–			
	$U_{\text{critical}}$	5			–		5			–			
	Conclusion	Samples are independent, but the result is on the verge of acceptable error			–		Samples are independent, but the result is on the verge of acceptable error			–			
U-test Stock dove and Rock dove (wild+domestic)	$U_{\text{empirical}}$	9.5					23.5						
	$U_{\text{critical}}$	15					26						
	Conclusion	Independent samples					Independent samples						

compared to extant outbred Ukrainian chicken. These samples are not always different from those obtained on materials from the late medieval settlements. The biggest difference is from those in Voin' (except the length of femur). It should be noted that this settlement is the most remote from Dubno in space (over 400 km as the crow flies) and links (Voin' was destroyed during the Mongol Invasion in 13<sup>th</sup> cent. AD opposed to the Hrodna and Vyshgorod). Samples from Dubno and Hrodna are the most similar. Late medieval Vyshgorod was located on periphery of the Rzeczpospolita Polska, while Hrodna and Dubno were local centers and active participants in economic and cultural processes in the country. It is possible that chickens from Dubno may have more kinship with those birds that lived westwards. However, data from other localities and obtained by additional methods (preferably molecular) are required to test this hypothesis. For other poultry, remains of goose are usual while the domestic duck is clearly absent.

Table 4. Comparison of size of ulna and tarsometatarsus in extant *Anas platyrhynchos* (wild form) and outbred *Anas platyrhynchos* f. *domestica* from Ukraine\*

Таблиця 4. Порівняння розмірів ліктьової кістки і тарзометаразуса в сучасних крижнів *Anas platyrhynchos* (дика форма) та безпородної домашньої качки з території України\*

Measurements (mm)	Ulna						Tarsometatarsus								
	Breadth of the proximal end		Diagonal of the distal end		Smallest breadth of the corpus		Greatest length		Breadth of the proximal end		Breadth of the distal end		Smallest breadth of the corpus		
	W**	D***	W	D	W	D	W	D	W	D	W	D	W	D	
	8.5	10.0	9.5	10.3	4.5	5.2	39.5	45.1	8.4	8.6	8.1	9.3	3.9	4.1	
	8.7	11.6	9.6	10.7	4.5	5.3	43.2	46.6	8.6	9.5	8.4	9.5	4.1	4.3	
	8.7	11.7	9.9	12.3	4.9	5.8	44.5	49.1	8.6	11.3	8.8	10.5	4.1	5.1	
	9.6	11.8	10.0	12.9	5.0	6.2	45.7	51.5	8.8	12.2	9.0	12.3	4.1	5.9	
	9.6	12.4	10.1	15.4	5.0	6.3	46.7	57.6	9.0	12.2	9.3	12.9	4.2	6.1	
	9.6		10.2		5.1		46.7	60.1	9.0		9.4	13.6	4.2	6.2	
	9.8		10.3		5.2		46.7		9.4		9.4		4.2		
	9.9		10.3		5.3		46.7		9.4		9.4		4.3		
	9.9		10.4		5.3		46.9		9.5		9.6		4.3		
	10.0		10.6		5.3		47		9.6		9.6		4.5		
	10.0		10.6		5.3		47.6		9.8		9.7		4.5		
	10.2		10.6		5.4		48.5		10.0		9.9		4.5		
	10.2		10.7		5.4				10.1						
	10.3		10.8		5.5										
	10.3		10.8		5.5										
	10.4		10.9		5.6										
	10.6		11.1		5.7										
					5.9										
Mann-Whitney U-test	U <sub>critical</sub>	7		14.5		21.5		17		15.5		11.5		13.5	
	U <sub>empirical</sub>	20		20		22		17		15		17		17	
	Conclusion	Independent samples						Indistinguishable samples				Independent samples			

Comments: \* – our data; \*\*W – wild form; \*\*\*D – outbred domestic form; p ≤ 0.05

Примітки: \* – наші дані; \*\*W – дика форма; \*\*\*D – безпородна домашня форма; p ≤ 0,05

Table 5. Measurements of ulna and tarsometatarsus in extant wild *Anas platyrhynchos*\* and remains of *Anas platyrhynchos* from Dubno

Таблиця 5. Порівняння розмірів ліктьової кістки і тарзометаразуса в сучасних крижнів *Anas platyrhynchos* (дика форма)\* та решток *Anas platyrhynchos* із Дубно

Measurements		Ulna			Tarsometatarsus	
		Breadth of the proximal end	Diagonal of distal end	Smallest breadth of the corpus	Breadth of the distal end	Smallest breadth of the corpus
Remains from Dubno (16 AD)	specimen No. AZ-5595	9.9	10.7	5.4	–	–
	specimen No. AZ-5596	9.1	10.4	5.2	–	–
	specimen No. AZ-5597	–	10.1	5.2	–	–
	specimen No. AZ-5571	–	–	–	9.3	4.7
	specimen No. AZ-5572	–	–	–	8.8	4.1
Extant <i>Anas platyrhynchos</i> (end of 19–20 <sup>th</sup> cent. AD)	Minimum	8.5	9.5	4.5	8.1	3.9
	Mean	9.8	10.4	5.2	9.2	4.2
	Maximum	10.6	11.1	5.9	9.9	4.5
	N	17	17	18	12	12

Comment: \* – our data

Примітка: \* – наші дані

Although the reduction of game birds (as compared to the Middle Ages) was moderate, bird hunting still played a prominent role. Certain proof of this may be a record in treasure register of Dubno castle in 1616 where a number of rifles on birds (*rucznicna ptasza*) are mentioned apart from the rifles on mammals (*rucznicna zwirzęca*) [13].

Waterfowl birds (mallard and northern shoveler) are predominated among birds bagged while hunting. Forest species (capercaillie, black grouse, possibly stock dove) and the inhabitants of open landscapes (partridge) are less numerous. The vast majority of remains have a medullary tissue therefore they belonged to females obtained during the hunting. Propensity to hunt during the nesting season distinguishes people, inhabiting Dubno castle in the 16<sup>th</sup> century, from the medieval people – the latter mainly hunted birds during the migration.

Remains of the rock dove are usual by found in materials of medieval and post-medieval settlements in Poland. However, remains of only one pigeon, possibly belonged to the stock dove, were found in Dubno. The absence of rock doves can be explained by omission during the manual processing of bone material or predation of dogs or pigs [11]. This explanation can hardly be used because stock dove and partridge are almost the same size as the rock dove, but their remains were found and preserved. We can assume that the rock dove was rare (or completely absent) in this region. This is also confirmed by Beauplan: “It (banquet table – L.G.) consists entirely of fried meat, such as [...] capons, chickens, hens, geese, as well as varied game birds, such as partridges, larks, quail and other small birds, which there are numerous. As for the pigeons, they occur rarely here as rabbits and snipe” [2]. The question of past distribution of the rock dove needs a special research.



**Table 6. Comparison of size of chicken bones from Dubno with extant and medieval chickens from Ukraine (mm)**

**Таблиця 6. Порівняння розмірів кісток курей із Дубно зі сучасними курми та курми зі середньовічних пам'ятників України (мм)**

Measurements		Locality					
		Dubno (16 <sup>th</sup> cent. AD)	Extant outbred chicken (20 <sup>th</sup> cent. AD)	Hrodna (11–14 <sup>th</sup> cent. AD)	Vyshgorod (12–13 <sup>th</sup> cent. AD)	Voin' (12–13 <sup>th</sup> cent. AD)	
Breadth of the distal end of humerus	minimum	<b>12.7</b>	13.4	12.9	12.7	13.1	
	mean	<b>13.8</b>	15.0	14.5	14.7	15.2	
	maximum	<b>16.0</b>	17.0	15.7	18.4	17.3	
	N*	<b>7</b>	44	11	15	19	
	Mann- Whitney U-test	u <sub>cr</sub>	–	95	21.5	42	35.5
		u <sub>emp</sub>	–	113	17	37	44
	C**	–	Independent samples	Indistinguishable samples	Indistinguishable samples	Independent samples	
Greatest length of femur	minimum	<b>69.8</b>	69.8	66.5	68.6	63.9	
	mean	<b>73.9</b>	80.8	73.4	79.5	77.2	
	maximum	<b>83.0</b>	92.8	82.9	99.7	87.5	
	N	<b>7</b>	65	10	20	18	
	Mann- Whitney U-test	u <sub>cr</sub>	–	87.0	28.0	40.0	45.5
		u <sub>emp</sub>	–	129.0	17.0	39.0	57.0
	C	–	Independent samples	Indistinguishable samples	Indistinguishable samples	Independent samples	
Greatest breadth of the proximal end of femur	minimum	<b>13.6</b>	12.1	12.6	14.0	13.3	
	mean	<b>14.6</b>	16.2	14.9	16.3	16.2	
	maximum	<b>16.1</b>	19.6	16.8	21.2	18.8	
	N	<b>7</b>	65	10	20	22	
	Mann- Whitney U-test	u <sub>cr</sub>	–	52.5	31.0	29.0	30.5
		u <sub>emp</sub>	–	91.0	19.0	39.0	48.0
	C	–	Independent samples	Indistinguishable samples	Independent samples	Independent samples	
Breadth of the distal end of femur	minimum	<b>13.2</b>	11.3	12.4	12.0	11.6	
	mean	<b>14.2</b>	15.4	14.0	15.3	15.4	
	maximum	<b>15.7</b>	19.5	16.1	20.1	18.5	
	N	<b>6</b>	65	10	20	20	
	Mann- Whitney U-test	u <sub>cr</sub>	–	8.5	11.0	0	1.0
		u <sub>emp</sub>	–	61.0	13.0	31.0	28.0
	C	–	Independent samples	Independent samples	Independent samples	Independent samples	
Breadth of the distal end of tibiotalarsus	minimum	<b>9.9</b>	8.8	10.0	9.5	9.7	
	mean	<b>11.3</b>	12.5	11.2	11.0	11.3	
	maximum	<b>13.6</b>	14.7	11.9	12.8	14.1	
	N	<b>8</b>	65	10	10	26	
	Mann- Whitney U-test	u <sub>cr</sub>	–	18.5	21.5	15.0	45.0
		u <sub>emp</sub>	–	43.0	8.0	9.0	29.0
	C	–	Independent samples	Indistinguishable samples	Indistinguishable samples	Indistinguishable samples	

**Comments:** \*N – number of specimens; \*\*C – conclusion

**Примітки:** \*N – кількість екземплярів; \*\*C – висновок

Determination of bird species in zooarchaeological materials allows reconstructing habitat of the past in detail [7]. Nowadays on the territory of Polesie nesting of the mallard and northern shoveler indicates that surrounding water bodies (at least some of them) have shores, covered with vegetation such as common reed (*Phragmites australis*), common bulrush (*Typha angustifolia*), reed mannagrass (*Glyceria maxima*). Nesting of the wild goose is evidence of presence of open stretches and coast with possibility of free access [4]. These results correlate with the above-mentioned data on fish composition. Pikeperch requires open areas without any vegetation, while the pike prefers coastal thickets.

## CONCLUSIONS

1. The combined analysis of remains indicates the presence of water bodies with open stretches and beaches with overgrown vegetation in vicinities of Dubno castle in the 16<sup>th</sup> century.
2. There were significant changes in the role of birds in the economy of inhabitants of the region. In medieval times people have ate mostly birds obtained on the hunting; poultry was dominated in a diet during the 16<sup>th</sup> century. Moreover, during the Middle Ages migration of birds was the main period for hunting. People from Dubno have hunted mostly during the breeding season.
3. Chicken was the main poultry, number of domestic geese were significantly fewer. Domestic chickens have had comparable size with medieval East Slavic chickens and were somewhat smaller than recent outbreed chickens. People have kept poultry in the castle and could have slaughter these birds regardless of ability to lay eggs.

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## РЕШТКИ РИБ І ПТАХІВ ІЗ ДУБЕНСЬКОГО ЗАМКУ (XVI СТОЛІТТЯ, РІВНЕНСЬКА ОБЛ., УКРАЇНА)

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У роботі представлено результати дослідження решток птахів і риб, знайдених під час розкопок шарів XVI ст. в Дубенському замку (Рівненська обл., Україна). Ці рештки належали 4 видам риб (судак, щука, плітка, невизначена коропова риба) і 8 видам птахів (крижень, широконіска, глушець, тетерук, куріпка, голуб (ймовірно, голуб-синяк), курка, гуска (ймовірно, домашня)). Порівняння із даними з більш ранніх археологічних пам'яток вказує на зміни ролі птахів у житті людей. Зростає частка домашніх птахів. На відміну від жителів середньовіччя, які полювали на птахів переважно в сезон міграцій, частина мисливських птахів із Дубно була здобута під час гніздового сезону. Аналіз решток риб і водоплавних птахів вказує на

наявність поблизу замку Дубно в XVI ст. водойми з великим відкритим плесом і берегами, зарослими очеретом. На території Дубенського замку в той час утримували свійську птицю. Домашні кури мали менші розміри порівняно з такими у сучасної безпородної курки та близькі до таких у середньовічних курей.

**Ключові слова:** рибальство, свійська птиця, Нові часи, Костянтин Острозький.

## **ОСТАТКИ РЫБ И ПТИЦ ИЗ ДУБЕНСКОГО ЗАМКА (XVI СТОЛЕТИЕ, РОВЕНСКАЯ ОБЛАСТЬ, УКРАИНА)**

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В работе представлены результаты исследования остатков птиц и рыб, найденных во время раскопок слоев XVI в. в Дубенском замке (Ровенская обл., Украина). Эти остатки принадлежали 4 видам рыб (судак, щука, плотва, неопределимая карповая рыба) и 8 видам птиц (кряква, широконоска, глухарь, тетерев, куропатка, голубь (вероятно, клинтух), курица, гусь (вероятно, домашний)). Сравнение с данными из более ранних археологических памятников указывает на изменения роли птиц в жизни людей. Возрастет доля домашних птиц. В средневековье люди охотились на птиц преимущественно в сезон миграций, часть охотничьей дичи из Дубно была добыта во время гнездового сезона. Анализ остатков рыб и водоплавающих птиц указывает на наличие вблизи замка Дубно в XVI в. водоема с большой открытой гладью и берегами, заросшими камышом. На территории Дубенского замка в то время держали домашнюю птицу. Домашние куры имели меньшие размеры по сравнению с таковыми у современной беспородной курицы и близкие к таковым у средневековых кур.

**Ключевые слова:** рыбалка, птица, Новое время, Константин Острожский.

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