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The Holocene avifauna of Bulgaria (A review of the ornitho-archaeological studies)

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Foreword

Recent Bulgarian avifauna comprises of 383 migratory, resident and vagrant species (МИЧЕВ, ЯНКОВ, 1993), 256 of which regularly or occasionally breed in the country.

Data on the formation and history of the recent Bulgarian avifauna are scarce. The Holocene avifauna of the country with a few exceptions has not been a subject to special investigations so far. Twenty one species have been reported in Pleistocene deposits and 14 of the Holocene, counted until the 7000 B.C. (BOEV, 1992). During Quaternary 3 bird species vanished from the Bulgarian fauna: *Lagopus mutus* (Montin) and *Pyrrhocorax pyrrhocorax* (L.) established by BOCHENSKI (1982) and *Tetrao tetrix* (L.) reported by Н. БОЕВ (1985 а) and З. БОЕВ (1988, 1993).

In the last 40 years another 10 species have been disappeared as nesting in the country: *Pelecanus onocrotalus* L. (МИЧЕВ, 1985 а), *Haliaetus albicilla* L. (ИВАНОВ, 1985), *Gypaetus barbatus* L. (БОЕВ, 1985 б), *Aegypius monachus* L. (МИЧЕВ, 1985 б)[1], *Grus grus* L. (БОЕВ, 1985 в), *Anthropoides virgo* L. (БОЕВ, 1985 г), *Otis tarda* L. (БОЕВ, 1985 g), *Otis tetrax* L. (БОЕВ, 1985 е), *Gallinago gallinago* (L.); (НАНКИНОВ, 1985), *Glaucidium passerinum* (L.) (СИМЕОНОВ, 1985), and a subspecies — *Phasianus colchicus colchicus* L. has lost its racial distinct fidelity (БОЕВ, 1985 ж).

Bird bone remains in the archaeological excavations in Bulgaria, with few exceptions, were subjected to collecting and studying since 1983, followed by the launching of a comparative osteological collection of birds in the National Museum of Natural History in Sofia. Under these circumstances, to the material have not been paid the attention needed in most cases leading to determination only of the findings of domestic fowl — fowl, duck, turkey (ИВАНОВ, 1956, 1959). From Neolithic to Eneolithic, after data by bibliography and personal investigations, 27 archaeological sites are known in the country, with at least 61 bird species established in them. With few exceptions (cases cited bellow) these materials, as well as finds of later periods, were unpublished till now.

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[1] Recently, after a period of about 30 years, a nest with one young was discovered in the Eastern Rhodopes Mts (S Bulgaria) (АНОНИМ., 1994).

The present paper aims at representing an ample review of all known up to date, bibliographic and personal author's information on Holocene avian localities, in most cases, archaeological remains of wild and poultry bird species and their significance for the population in the ancient settlements on Bulgarian lands. Thus, it may be considered as a continuation of a previous analogous paper (BOEV, 1992) on paleornithological studies in Bulgaria. A short preliminary report on the same topic entitled 'Birds from Antiquity in the Bulgarian Lands' was presented at 6-th International Conference of the International Council for Archaeozoology (Washington — May, 1990).

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Bibliographical review

Published information on the ancient bird remains from Neolithic and dated later archaeological sites in Bulgaria are present in the work of DENNEL (1979) (7 000 B.C. — as 'unidentified bird bones' from a Neolithic mound at Chelopech village). КОВАЧЕВ (1988) reports on 9 bird species — 'swan, pelican, wild goose, mallard, capercaillie, black grouse, pheasant, grey partridge, and eagle' (p. 8) from the Early Neolithic settlement at Kazanluk. From an Early Neolithic settlement at Rakitovo village КОВАЧЕВ,МИНКОВ (1986) report on 'swan' bones found there (p. 89). In the ancient town Kabyle (1st millennium B.C. — 6th century A.D.) РИБАРОВ (1983, 1990) reports on remains of *Phasianus colchicus, Anser* sp., and '*Gallus domesticus*'. A new recently published paper (БОЕВ, РИБАРОВ, 1993) summarises all archaeornitnological information concerning 17 bird taxa at least, established in that town.

About 'unidentified bird bones' from Neolithic to Eneolithic sites is mentioned by ПОПОВ (1911, 1912, 1921 а, 1925), and from Neolithic-Eneolithic Deneva mound, Kodjadermen mound and Rousse mound — by ПОПОВ (1909, 1915, 1921 б). In Deneva mound ПОПОВ (1915) has found a tarsometatarsal bone of a Falconiform species. During the renewed excavations in Rousse mound in 1987, bone remains of birds were not found by the author. ПОПОВ (1909) announced excavated unidentified avian humerus, ulna and tibiotarsus in Kodjadermen mound, and in other study (1918) — for undeterminated bones of birds.

ИВАНОВ, ВАСИЛЕВ (1975) have identified bones belonging to *Anser anser* L., *Anas platyrhynchos, Cygnus* sp. and nonspecified avian bones from the Eneolithic mound Golyamo Delchevo.

Bone remains of *Phasianus c. colchicus* and a large eagle (*Aquila* sp.) were found by БОЕВ (1986) in Medieval settlement at Garvan (6th — 11th century). *Cygnus olor* (Gm.), Anatidae gen. and *Podiceps* sp. were identified by РИБАРОВ (pers. comm.) among the osteollogical findings at the sunken Early Bronze age settlement Urdoviza. At the same site, БОЕВ, РИБАРОВ (1990) established a total of 25 species of birds of wetland avifauna.

Twenty-one game and poultry species of birds were established in the medieval Bulgarian capital Veliki Preslav (9th — 10th century) (БОЕВ, ИЛИЕВ, 1989; 1991; ИЛИЕВ, БОЕВ, 1990) [1]. Dated of the very same period are the remains of 14 bird species from the medieval settlement Hissarluka (present Sliven, 10th — 12th century) (БОЕВ,

РИБАРОВ, 1989). ИВАНОВ (1956) finds 3 bones of domestic fowl in Gradishteto near Popina village, Silistra District (4th — 6th century), whilst among thee material from Preslav ((9th — 16 th century) he finds 106 bird bones, 32 of which belong to *Meleagris gallopavo* (ИВАНОВ, 1956). Those appear to be the earliest dated records of that species in Bulgaria.

There are a few publications on bird osteological material from the settlements of Roman epoch in Bulgaria so far. The study of WALUSZEWSKA-BUBIEN & KRUPSKA (1983) for the Roman town of Novae (present Svishtov) reports on 102 bone remains of 7 avian species. Considerably richer is the species composition of the Roman town of Nicopolis-ad-Istrum (2nd — 6th century A.D.), where 31 species of birds were registered (БОЕВ, 1991; BOEV, in press — a).

Material and methods

The volume of the material studied estimates at 5 306 bird bones and bone fragments, major part of which were collected during the period 1983—1993. Herein, materials of other authors are not included, but the species composition has been discussed. Reported data treats 56 sites and the materials of 46 of which were investigated by the author. The number of the unidentifiable bone fragments is 410 (7.06%). Part of the material has been collected by the joint archaeological expeditions: Bulgarian-British at Nicopolis-ad-Istrum (2352 bones), Bulgarian-Italian at Ratiaria (65 bones), Bulgarian-French at Kovachevo (2 bones). The rest of the material has been acquired through excavations by Bulgarian archaeologists and in most cases — with participation of the author.

The species determination has been accomplished by comparison of osteological material with the corresponding specimens of the comparative osteological collection of birds at the National museum of Natural History, Sofia. Scientific names of birds are given after HOWARD & MOORE (1980).

The investigated sites and the actual dating are as follows:

1. Kovatchevo (ca. 7 900 B.C.)
2. Slatina (ca. 6 000 B.C.)
3. Malak Preslavets (ca. 6 000 B.C.) [2]
4. Kazanluk (ca. 6 000 B.C.)
5. Rakitovo (ca. 6 000 B.C.)
6. Ovtcharovo (3845 — 3470 B.C.) [3]
7. Tchelopetch (ca. 6 000 B.C.)
8. Rousse (6 000 — 4 000 B.C.)
9. Durankulak — (6 000 — 4 000 B.C.)
10. Bagatchyna (4 000 — 1000 B.C.)
11. Turnovsky Dervent (5 000 — 4 000 B.C.)
12. Topolnitsa (4 900 B.C.)
13. Pipra (4 200 B.C.)
14. Storgozia (4 200 B.C.)
15. Golyamo Deltchevo (4 020 — 3690 B.C.) [4]
16. Yagodinska Cave (ca. 4 000 B.C.)

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[1] These three papers have been submitted after the paper of BOEV (1992), so the number of the species established is larger.

[2] The Neolithic finds of this site seems to be mixed with those of another settlement from the roman epoch (3rd — 4th century A.D.), situated over the Neolithic mound (Dr Ivan Panayotov, pers. comm.)

[3] According to BOYADJIEV (1988). The age of most of the sites is according the archaeologists, organized the excavations and the published data (see the bibliography).

[4] According to BOYADJIEV (1988).

17. Belyakovsko Plato (4 000 — 3 000 B.C.)
18. Dolnoslav (4 000 — 3 000 B.C.)
19. Telish (3 450 — 3 220 B.C.)
20. Kodzhadermen (3 000 B.C.)
21. Deneva mound (3 000 B.C.)
22. Metchata Doupka Cave ('Early Holocene')
23. Gulubovo ('Eneolithic to Middle Bronze Age')
24. Golyamata Kauna Cave ('Eneolithic')
25. Urdoviza (3 000 — 2 000 B.C.)
26. Lepenitsa Cave (ca 3 000 B.C.)
27. Sozopol (3 000 — 2 000 B.C.)
28. Yajlata ('Late Holocene')
29. Brashlyanskata Cave ('Late Holocene')
30. Yassa-Tepe (1st millennium B.C.)
31. Kabyle (1st millennium B.C. — 6 th century A.D.)
32. Arbanas (1st — 3rd century A.D.)
33. Durankulak — 2 (1st — 4th century A.D.)
34. Mislovishka Cave (2nd — 4th century A.D.) [1]
35. Zelenigradska Cave (2nd — 4th century A.D.)
36. Ratiaria (2nd — 4th century A.D.)
37. Abritus (3rd — 4 th century A.D.)
38. Nicopolis-ad-Istrum (2nd — 6th century)
39. Novae (2nd — 6th century)
40. Armira (3rd century)
41. Kostinbrod (1st half of 4th century A.D.)
42. Bela Voda (3rd — 4th century)
43. Popina (4th — 6th century)
44. Karnobat (6th — 9th century)
45. Karanovo (5th — 7th century A.D.)
46. Garvan (6th — 11th century)
47. Preslav (9th — 16th century)
48. Krivnya (9th — 10th century)
49. Jambol (9th — 13th century)
50. Baba Vida (8th — 17 th century)
51. Hissarluka (9th — 12th century)
52. Pliska (10th century A.D.)
53. Dyadovo (11th — 12th century)
54. Voden (10th — 14th century)
55. Iskritsa (11th — 12th century A.D.)
56. Shoumen Castel (14th — 15th century A.D.).

In regard of the dating, the material analysed belongs to the following periods: Neolithic — No 1—14; Eneolithic — No 14—27; Bronze Age — No 10, 15, 23, 25, 27; Iron Age — No 10, 30, Hellenic Epoch — No 31, ; Roman Epoch — No 31—42; Byzantine Epoch — No 31, 43—46, and Medieval Ages — No 47—56. The numbers of the sites correspond to those on Fig. 1.

Species composition and distribution of birds during the Holocene

Subfossil remains of birds in Bulgaria are attributed to a general of 117 taxa. Eighty-five of them are determined to species level, 14 — to genus level, 5 — to subfamily level, 8 — to family level, and 5 — to order level. Fifteen of total of 19 orders of recent Bulgarian avifauna are represented in Holocene deposits: Gaviiformes, Podicipediformes, Pelecaniformes, Anseriformes, Ciconiiformes, Falconiformes, Galliformes, Gruiformes, Charadriiformes, Columbiformes, Strigiformes, Caprimulgiformes, Coraciiformes, Apodiformes and Passeriformes.

[1] In 1994 a second site of the cave has been found by Dr Ivan Pandurski and dated Upper Pleistocene by Dr Vassil Popov.

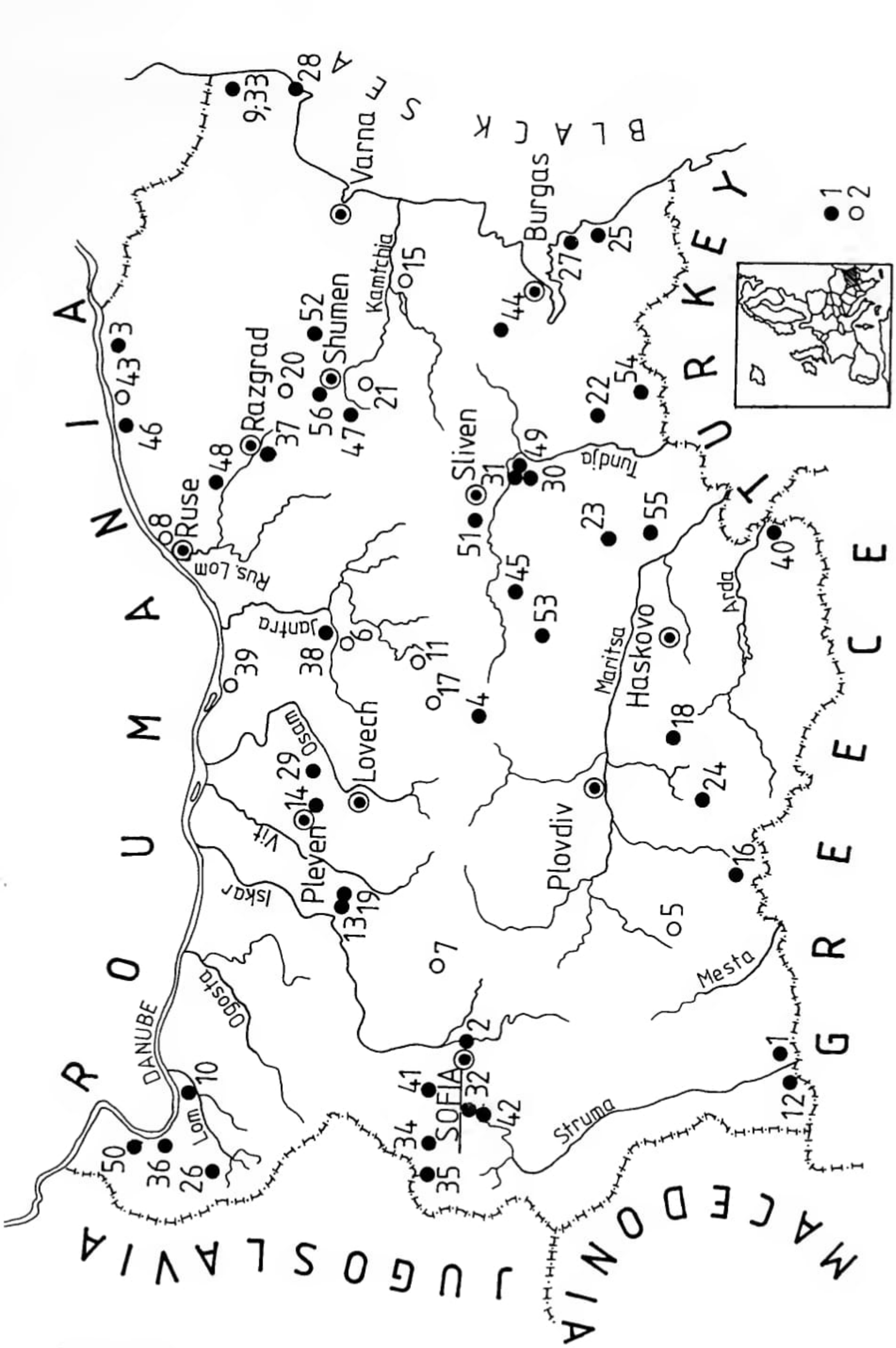

Fig. 1. Location of the archaeo-ornithological sites in Bulgaria (The numbers on the map correspond to those in the text): 1 — site, studied by the author; 2 — sites, refered by literature.

Species established in the Bulgarian archaeological sites and Holocene deposits comprise 25.06% of the recent avifauna of the country. In accordance to their habitat preferences, the species established are divided in 6 basic habitat complexes recorded in the order of their spreading: wetland, woodland, petrophilic, field (openland), steppe, and synanthropic. The last one is enumerated rather as a convenient term, because there are not synanthropic birds according to their origin (BOEV, 1993). Thirty-seven species are rare, endangered or disappeared at present and they are enlisted in the Bulgarian Red Data Book.

Wild birds in ancient human settlements

Game birds

Refering to archaeological materials, overall were established 50 taxa (36 species), which could be enlisted in a game birds category, i. e. wild birds, which upon the near past have been widely spread in the country and has utilised as a food-resource or/and feathers, down, etc. As a feather and down suppliers are specified 5 species: *Cygnus olor* (Gm.), *Podiceps cristatus* (L.), *P. nigricollis* C. L. Brehm, *P. griseigena* (Fodd.), and *Gavia stellata* (Pontopp.), whose meat might have served as food resource, indeed. All they are large marsh birds, weighted (with an exception of *P. nigricollis*) at 0.7 — 3.5 kg even exceeding to 10.0 kg. The group of water (hydrophilous) birds (26 taxa, 16 species) represent the greatest share of the species diversity. Although originated from different settlements, the bird osteological material allows to trace down the actual decrease of the relative share of the game birds in the bird-meat provisioning for ancient citizens. For instance, in Early Bronze Age (3 000 — 2 000 B.C.; Urdoviza) the game birds has provided 100% of the bird-meat supplies for the local settlers, in the Roman Epoch (2nd — 6th century A.D.; Nicopolis-ad-Istrum) — 42.7%, during the Middle Ages (9th — 12th century A.D.) — 33% (Hissarluka) and 18.5% (Veliki Preslav) respectively. Undoubtable, the reason for such fall down, could be contributed to the uprise of the significance of poultry breeding as a constant source of meat and other bird products.

Anseriform birds

The order Anseriformes in the Bulgarian avifauna is represented by 31 species. Its Holocene record include 24 taxa (14 species). In a previous paper BOEV (1991) reports on 12 species of wild geese, ducks and diving ducks established among the archaeological material of the ancient Bulgarian settlements. Most of these species (Table 1) are winter migrants in Bulgaria and usually are abound during winter time around nonfreezing reservoirs: *Anser albifrons, A. fabalis, A. erythropus, Anas crecca, A. penelope*. Thus, in winter time they might be hunted in a considerable amount by the settlers of neighbouring settlements in the past. To the contrary, bones found, attributed to juvenile specimens with not fully accomplished grown-development, are a clear indication of spring and summer hunting activities. Such remains are determinated as uncompletely as 'Anatidae gen.', 'Aythyni gen.', etc. (Table 1).

The significance of Anseriform birds in providing of game bird meat for the most of the settlements dwellers has been rather important. At Nicopolis-ad-Istrum they have consisted 54.9% of the game birds meat consumed, as in the Early Bronze Age settlement Urdoviza at their share had fallen to 50.4% of the total number of culled game birds.

Fig. 2. Two humeral bones of shelduck (*Tadorna tadorna*) from Veliki Preslav (9th — 10 th century A.D.). Photo: Viktor Hazan.

Galliform birds

According to their species composition and their relative share, these birds are placed second in utilisation by the ancient settlers on the Bulgarian lands. Thereabout, were established 6 of total 8 species represented in the order Galliformes in the recent avifauna of Bulgaria (Table 1).

One species (*Tetrao tetrix*) at present is disappeared, as the found bone remnants discovered at four sites from the the Paleolithic to the recent times, are the only evidence for its past spread in Bulgaria (Боев, 1988, 1993, 1994).

No subfossils were found of *Tetrastes bonasia* (L.) and *Alectoris chukar* (J. E. Gray). The latest, being osteologically close to *Alectoris graeca* and by no means could be determined confidentially, based just on single bones.

Nowadays, *Tetrao urogallus* in many of its localities in Bulgaria is endangered, and at most of its nesting sites it has disappeared (Боев, 1985 з). Archaeozoological data on that species originate from two Middle Ages localities — Hissarluka (Боев, Рибаров, 1989) and Baba Vida (Боев — под печам) of which possibly it has disappeared not later than the middle of 19 century. Remains of cappercaillie have been reported by Василев (1985) for the Eneolithic mound at Ovcharovo and Рибаров, Боев (под печам) for the Neolithic settlement at Telish. That species is also known from the Early Neolithic of Kazanluk by our determinations (Боев, 1993) and by the work of Ковачев (1988).

The gray partridge has been the most numerous and with widest distribution among the galliform birds, both in southern, as well as in the northern part of the country. The most ancient archaeological findings of *Perdix perdix* come from Durankulak (6 000 — 4 000 B.C.). In some of the cases, the majority of the bone material of species, as for those of quails, belong to juvenile individuals. Juveniles of both species (*Al. graeca* and *P. perdix*) comprise, for instance, about 65% and 80% respectively at Nicopolis-ad-Istrum (Боев, 1991).

The subfossil remains of the native nominative form of the common pheasant (*Phasianus colchicus colchicus*), are of greater interest for clarifying its distribution in the past on the Bulgarian lands. There is no identical opinion considering the ori-

Table 1

Species composition and distribution of bird bone finds in the Holocene sites (mainly settlements) in Bulgaria

No	Species	Number of bones	Sites *
1	2	3	4
	Gaviiformes		
1.	*Gavia stellata* (Pontopp.)	2	25
2.	*Gavia arctica* (L.)	1	27
3.	*Gavia arctica / stellata*	2	25
	Podicipediformes		
4.	*Podiceps nigricollis* C. L. Brehm	2	25
5.	*Podiceps griseigena* (Bodd.)	1	25
6.	*Podiceps cristatus* (L.)	5	25
	Pelecaniformes		
7.	*Pelecanus onocrotalus* L.	6	4, 25, 41, 48
8.	*Pelecanus* sp.	1	38
9.	*Phalacrocorax carbo* (L.)	17	25, 27, 38
10.	*Phalacrocorax aristotelis* (L.)	1	25
11.	*Phalacrocorax carbo / aristotelis*	1	25
	Ciconiiformes		
12.	*Ardea cinerea* L.	2	27, 50
13.	*Ardea cinerea / Egretta alba*	1	30
14.	*Ciconia ciconia* (L.)	3	18, 31, 40
15.	*Ciconia ciconia / nigra*	1	31
	Anseriformes		
16.	*Cygnus olor* (Gm.)	36	4, 25, 33, 38, 48
17.	*Anser anser* (L.) (incl. *A. a. domestica*)	143	23, 25, 30—32, 33, 38, 46—49, 51, 55
18.	*Anser anser domestica*	29	19, 45, 51
19.	*Anser albifrons* (Scop.)	4	25, 32, 48
20.	*Anser* cf. *albifrons* (Scop.)	1	51
21.	*Anser albifrons / fabalis*	3	23, 47
22.	*Anser erythropus* (L.)	1	25
23.	*Anser* cf. *fabalis* (L.)	5	38, 47
24.	*Anser* sp.	12	10, 38, 47
25.	*Tadorna tadorna* (L.)	3	30, 38
26.	*Tadorna* cf. *ferruginea* (Pall.)	1	47
27.	*Tadorna* sp.	1	3
28.	*Anas platyrhynchos* (incl. *A.pl. domestica*)	28	14, 25, 27, 31—33, 35, 36, 38, 42, 47, 48, 50

* The numbers of the sites correspond to those of Fig. 1.

Table 1 (continuation)

1	2	3	4
29.	*Anas crecca* L.	4	38
30.	*Anas penelope* L.	2	38, 47
31.	*Anas querquedula* L.	5	27, 31, 36, 38
32.	*Anas* sp.	3	33, 38, 47
33.	*Aythya ferina* (L.)	4	25, 38
34.	*Aythya nyroca* (Guld)	5	25, 27
35.	*Aythya* sp.	4	25, 27
36.	*Netta / Aythya* sp.	3	25
37.	Aythyni gen. — I	3	25
38.	Aythyni gen. — II	3	25
39.	Anatinae gen.	67	10, 25, 27, 38, 50
	Falconiformes		
40.	*Pernis apivorus* (L.)	1	1
41.	*Accipiter gentilis* (L.)	7	3, 38, 51
42.	*Accipiter nisus* (L.)	2	38
43.	*Buteo buteo* (L.)	4	31, 38, 51
44.	*Buteo* cf. *buteo* (L.)	1	16
45.	*Buteo lagopus* (Pontopp.)	2	1, 2
46.	*Buteo* sp.	1	38
47.	*Hieraetus fasciatus* (Vieill.)	7	30, 51
48.	*Aguila* cf. *heliaca* Sav.	2	33, 51
49.	*Aquila chrysaetos* (L.)	3	3, 19, 23
50.	*Aquila* cf. *chrysaetos* (L.)	1	51
51.	*Aquila pomarina* Ch. L. Brehm	1	45
52.	*Aquila* sp.	1	46
53.	*Aquila / Haliaeetus*	2	3
54.	*Gypaetus barbatus* (L.)	4	32, 38
55.	*Gyps fulvus* (Habl.)	5	10, 31, 36, 47, 51
56.	*Circaetus gallicus* (Gm.)	3	37, 47
57.	*Falco tinnunculus* L.	2	38
58.	*Falco* cf. *tinnunculus* L.	1	35
59.	*Falco cherrug* J. E. Gray	1	31
60.	Accipitridarum indet.	4	12, 27, 31, 38
61.	Falconiformes fam.	3	10, 38
	Galliformes		
62.	*Meleagris gallopavo* L.	2	47, 50
63.	*Alectoris graeca* (Meisner)	3	38, 51
64.	*Alectoris / Perdix*	9	38, 42, 51
65.	*Perdix perdix* (L.)	161	4, 9, 23, 28, 32, 35, 38, 40, 55, 56
66.	*Coturnix coturnix* (L.)	50	24, 28, 38
67.	*Phasianus colchicus* L.	62	18, 23, 31, 33, 34, 36, 38, 44, 46, 48, 55
68.	*Pavo cristatus* L.	1	38
69.	*Tetrao urogallus* L.	13	16, 18, 50, 51
70.	*Tetrao tetrix* (L.)	5	4, 16
71.	*Gallus gallus domestica*	2109	13, 26, 30—38, 42, 44, 45, 47—53, 55
72.	*Gallus / Phasianus*	173	19, 27, 36, 38, 42, 55
73.	Galliformes fam.	3	30, 38

Table 1 (continuation)

1	2	3	4
	Gruiformes		
74.	*Fulica atra* L.	122	25, 27, 28, 33
75.	*Gallinula chloropus* (L.)	10	28
76.	*Rallus aquaticus* L.	2	28
77.	*Porzana* cf. *pussila* (Pall.)	1	28
78.	*Grus grus* (L.)	8	4, 30, 31, 33, 50
79.	*Otis tarda* L.	21	4, 23, 30, 31, 38, 44, 51, 55
80.	*Otis tetrax* (L.)	2	3, 38
	Charadriiformes		
81.	*Tringa nebularia* (Gunnerus)	1	3
82.	*Larus* sp.	3	25, 37, 38
83.	*Recurvirostra avosetta* L.	1	28
84.	Charadriidarum indet.	1	9
85.	Charadriiformes fam.	1	38
	Columbiformes		
86.	*Columba livia* L. (incl. *C. l. domestica*)	45	22, 32, 34, 38, 47, 51, 55
87.	*Columba oenas* L.	3	38
88.	*Columba palumbus* L.	6	38
89.	*Columba* sp.	1	47
90.	*Columba / Streptopelia*	1	45
91.	*Streptopelia turtur* (L.)	12	31, 38, 51, 52
92.	Columbiformes fam.	2	28
	Strigiformes		
93.	*Athene noctua* (Scop.)	2	38
94.	*Strix aluco* L.	4	38, 47, 51
95.	*Bubo bubo* (L.)	2	32, 35
	Caprimulgiformes		
96.	*Caprimulgus europaeus* L.	1	38
	Coraciiformes		
97.	*Merops apiaster* (L.)	1	10
	Apodiformes		
98.	*Apus apus* (L.)	1	28
	Passeriformes		
99.	Alaudidarum indet.	1	24
100.	*Hirundo daurica* L.	2	29, 34

Table 1 (continuation)

1	2	3	4
101.	*Riparia riparia / rupestris*	1	29
102.	*Turdus* sp.	1	38
103.	*Turdus merula* L.	1	34
104.	*Passer domesticus* (L.)	3	38
105.	*Passer / Fringilla*	1	38
106.	*Fringilla coelebs* L.	3	38
107.	*Carduelis* cf. *cannabina* (L.)	1	38
108.	*Sturnus vulgaris* L.	5	22, 38
109.	*Garrulus glandarius* (L.)	3	22, 34, 38
110.	*Pica pica* (L.)	6	38, 54
111.	*Nucifraga caryocatactes* (L.)	1	38
112.	*Pyrrhocorax graculus* (L.)	2	35, 38
113.	*Corvus monedula* L.	8	35, 38
114.	*Corvus frugilegus* L.	6	7, 38
115.	*Corvus corone* (? *cornix*)	8	4, 38, 47
116.	*Corvus corax* L.	4	32, 45
117.	Passeriformes fam.	4	29, 34, 38
	Aves indeterminatum	149	23—25, 27, 31, 38, 47
	Total	3532	1—4, 9—10, 12—14, 16, 18—19, 22—38, 40—42, 44—56

gin of this species (resp. subspecies) in Balkans and Europe in the Bulgarian and foreign citations. Some of the authors deny its native autochtonic origin, assuming also, that Europe has always been out of its natural range (БУТУРЛИН, 1935; ИВАНОВ, 1951; ГЛАДКОВ, 1952; FEHRINGER, 1956; ПОРТЕНКО, 1958; СТЕПАНЯН, 1975; HOWARD & MOORE, 1980; CRAMP & SIMMONS, 1980). According to various bibliographic data transference of the Colchid subspecies of the pheasant in Europe and the Balkans from Ancient Colchida has been completed by Hellenic navigators, Romans, or Cruisaders (11th — 13th century). It is known, that all the subspecies rest (*Ph. colchicus torquatus, Ph. c. mongolicus* etc.) has been introduced to Europe lately, not earlier than 17th century. Therefore, the remnants of *Ph. colchicus* anciently dated, could be considered to such of *Ph. c. colchicus*. It is believed that the only locality in Bulgaria and on the Balkan peninsula and Europe respectively, whereabout it has arrived as a relatively pure subspecies up to present days, is Dolna Topchiya nature reserve, south of Elchovo (БОЕВ, 1985 ж). According to this author, the subspecies has been spread throught the Ludogorie region, along the valleys of rivers Tundzha and Maritsa, as well as Southeastern Bulgaria.

Our bone finds from Antiquity and the Middle Ages prove its wider distribution in the past. During 2nd to 4th century wild pheasants have been spread in the environs of Kabyle (БОЕВ, РИБАРОВ, 1993), Ratiaria (ИЛИЕВ и др., 1993) and Nicopolis-ad-Istrum (БОЕВ, 1993), while in 6th to 9th century — in the environs of Karnobat, 10th to 14th century — in Strandzha Mts (Voden), 9th to 11th century — in the neigh-

bourhood of Veliki Preslav and Krivnya (Боев, под печат), 6th to 11th century — at Garvan and 10th to 12th century — in the environs of Dyadovo and Hissarluka. The eldest remains of the species originate, though, from the Hellenistic sanctuary at Zaychy vrah (Kabyle) of 7th century B.C. Therefore it is being made clear that the pheasant has been widely spread in the past throughout Southern Bulgaria as well as Northern Bulgaria, including the western regions. It is also made clear, accepting the introduction from Colchida, version, that this ought to have been accomplished by the ancient Greeks, and besides, before 7th century B.C., since by that time, *Ph. colchicus* has been spread in the ancient Bulgarian lands.

Being a game bird meat source, the Galliform species always bore considerable significance. Through them, the citizens of Nicopolis-ad-Istrum had provided for themselves about 34.9% whilst at Veliki Preslav — 25.5% from the game bird harvests.

Columbiform birds

At present, 6 columbiform species are nesting in Bulgaria: *Columba livia* L., *C. oenas* L., *C. palumbus* L., *Streptopelia turtur* (L.), *Str. roseogrisea* (L.), and *Str. decaocto* (Friv.). The latest species has penetrated Balkan peninsula via Asia Minor. *Str. decaocto* is inhabiting Bulgaria since the end of 17th — beginning of 18th century, as for Europe has been recorded at a prime on the Crete island during the 2nd half of the 16th century (Боев, 1963). *Str. roseogrisea* is a new invader for the Bulgarian avifauna — it has been annotated in 1981 by Янков (1983). Only 4 species (*C. livia, C. oenas, C. palumbus,* and *Str. turtur*) are established in the archaeozoological material. The four species altogether were recorded only at Nicopolis-ad-Istrum (Boev, in press- a), while the turtle dove and rock (and feral) pigeon — at Hissarluka. *C. livia* is found at Veliki Preslav, while *Str. turtur* — at the Roman layers in Kabyle. The stock dove at present is an endangered species in Bulgaria (Спиридонов, 1985), while the rock pigeons is threatened by the crossbreeding with the feral pigeons (*C. livia domestica*) populations.

At the richest upon avian subfossil finds archaeological site — Nicopolis-ad-Istrum — the Columbiformes species comprise 12.8% of the total game meat consumed.

Gruiform birds

Seven species (*Fulica atra, Gallinula chloropus, Rallus aquaticus, Porzana cf. pussilla, Grus grus, Otis tarda* and *Otis tetrax*) of the total of 11 gruiform species of recent Bulgarian avifauna, were determined among the bone remains. Until 50 years before they have been common game birds at the country's lowlands. At present, *F. atra* is the only species, which breeds in Bulgaria and is still common in the wetlands of the country. The rest of the species, are encountered under 'extremely rare' survival status in the Red Data Book of Bulgaria (Боев, 1985 б, г, е) The bones of *O. tarda,* found from the east part of the Thracian plain (Kabyle, 1st millennium B.C.; Yassa-Tepe, 1st millennium B.C.; Karnobat, 6th — 9th century A.D. and Hissarluka, 10th — 12th century A.D.), as well as the central part of the Danubian Plain (Nicopolis-ad-Istrum, 3rd — 4th century), are of considerable interest. According to the infor-

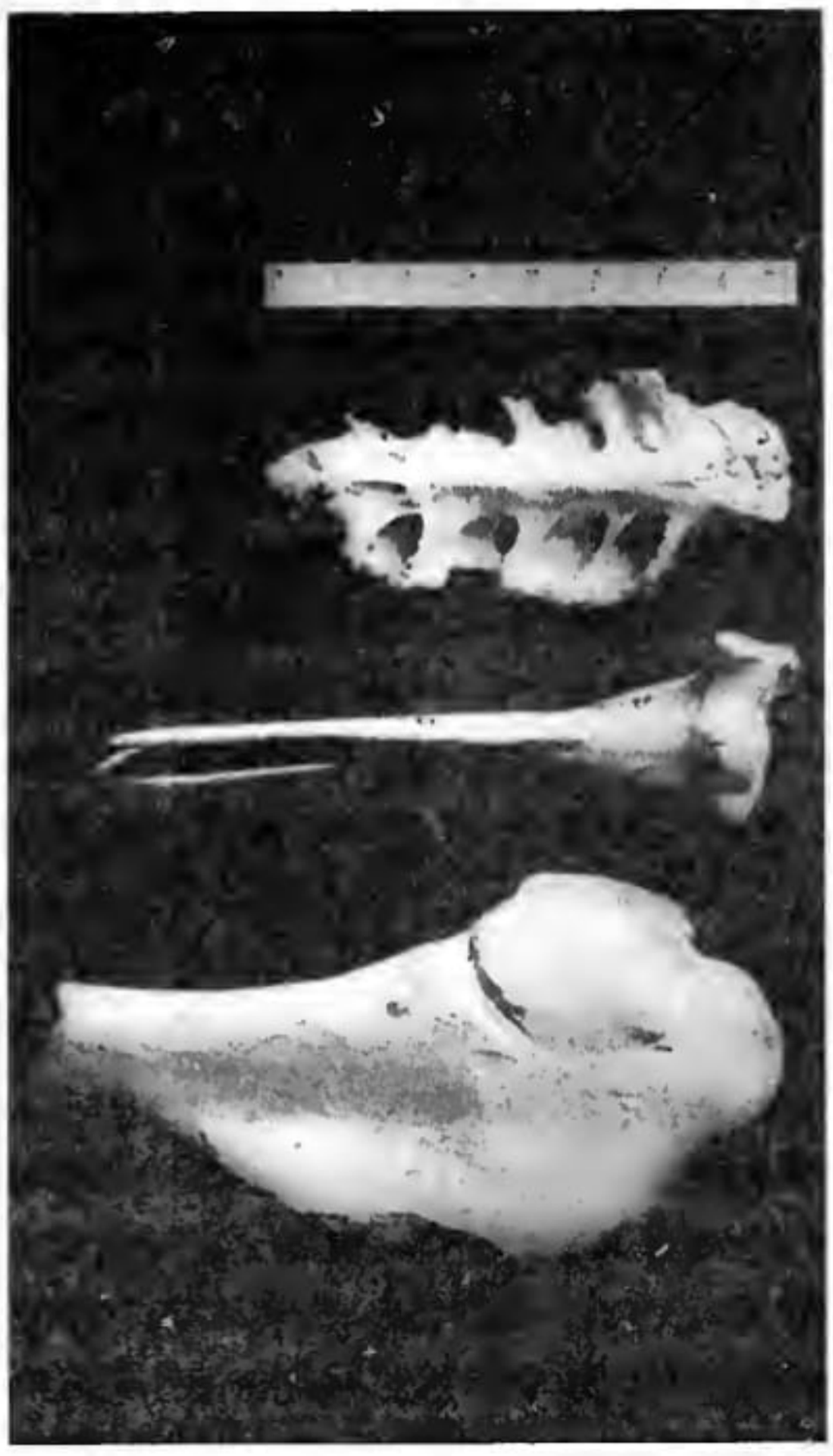

Fig. 3. Some of the bone finds of great bustard (*Otis tarda*) from Yassa-Tepe (1st millennium B.C.). Top to botom: axial fragment of pelvis; proximal part of tibiotarsus; proximal end of humerus. Photo: Viktor Hazan.

Fig. 4. Left ulna of little bustard (*Otis tetrax*) from Malak Preslavets (6 000 — 4 000 B.C.). Photo: Viktor Hazan.

mation available so far, the species has inhabited predominantly the steppe regions of Dobrudzha (NE Bulgaria). The mentioned sites are an indication of wider distribution in the past of the great bustard in the plane openlands of the Northern and Southeast Bulgaria. Bone remains of *O. tetrax* from Neolithic age were found at the ancient settlement of Malak Preslavets (NE Bulgaria). The little bustard has disappeared as nesting species in the country from the same region during the 60-thies of this century (Боев, 1985 e).

Birds of prey
(Falconiform and Strigiform birds)

It is most probable, that those two groups of birds have played rather significant role in the life of the ancient civilisations, in a contrast of the regular perceptions. It has been surprising that their remains were established at 21 of the total of 56 archaeological sites. Nonetheless, some of the species were registered at 5 settlements, *Gyps fulvus* (Hablz.), for instance. A total of 15 species, three of them Strigiformes:

Fig. 5. Carpometacarpal bones: of golden eagle (*Aquila chrysaetos*) from Malak Preslavets (6 000 — 4 000 B.C.) (left) and griffon vulture (*Gyps fulvus*) from Ratiaria (2nd — 4th century A.D.) (right). Photo: Viktor Hazan.

Bubo bubo (L.), *Strix aluco* L. and *Athene noctua* (Scop.), were established. It seems, that *G. fulvus, Accipiter gentilis* (L.), *Buteo buteo* (L.), *Aquila chrysaetos* (L.) and *S. aluco* were the most abounding species in the ornitho-archaeological material. Such extremely rare, at present, birds as *Falco cherrug* J. E. Gray, *Circaetus gallicus* (Gm.), *Hieraetus fasciatus* (Viell.) and especially, *Gypaetus barbatus,* are also present in the studied material even by single bones.

Numerous sources confirm, that Bulgarians up to the Ottoman rule (14th — 19th century) from the different provinces of country, have been levied with falconeried various species of birds of prey, such as, saker falcons, goshawks, sparrowhawks, golden eagles, imperial eagles, etc. These species were practiced for falconery even before — during the Byzantine period (11th — 12th century). In Bulgaria relevant information for practicing of falconery in the deeper past (Roman rule), is lacking. It is probable that such an noble hunting technique could have been rooted in Europe from the East Roman provinces. STERNBERG (1969) mentions that the oldest written information on falconery in Europe are associated with the rule of Frank king Meroving the 2nd (Chlodwig, 481 — 511).

Some of the species registered at the Roman cities in Bulgaria, for example, lammergeier, griffon vulture, etc. could have been kept in volieral enclosure as zoo pets magnificant, large-sized, and fancy feathered birds. Primaries and tail feathers of eagles were used for arrow-endings in the Middle Ages — a habit, survived untill 18th century in Bulgaria. There are various data indicating that the Old Bulgarians (Proto-Bulgarians) arrived on the Balkans from Asia, have been transferred the customs of falconery.

The group of duirnal and nocturnal birds of prey, as general, is represented with a small numbered specimens. These comprise 1.9% (66 bones) out of the total bone material studied.

Birds of unstated significance for man

This group is completed mainly by all species, whose subfossil remains were found in the ancient towns and villages of the country, but were not encountered as potential game (hunting) objects. An interpretation of this could serve the fact, that under normal conditions, at present and in the past, they were not valued as resources for meat, feathers, down, etc. It might have been possible that they were used as meat

provisions to dogs and kept voliered falcons, eagles, etc. Nonetheless, the presence of such species could has been occasional. Nine species are included in this group, as well as these of *Ardea cinerea / Egretta alba, Pelecanus* sp., *Phalacrocorax carbo / aristotelis,* and *Larus* sp. Some of the species (*Gavia stellata, Podiceps cristatus, Ph. carbo, Ph. aristotelis*) are recorded at the sunken settlements at Urdoviza (Early Bronze Age) and at Sozopol (Eneolithic and Early Bronze Age) and actually, the possibility of being used as food resources, is not excluded (Боев, Рибаров 1990; Boev, in press — c). Тугаринов (1947) reports, until the beginning of the 20th century in some regions of Central Asia, some heron species (family Ardeidae) has been valued for their meat. The white pelican, according to archaeozoological data, is known from 4 sites from Early Neolithic to the Middle Ages: Kazanluk, Urdoviza, Kostinbrod, and Krivnya. Pelicans are recorded in Nicopolis-ad-Istrum also.

Undoubtedly, the finds of *Nucifraga caryocatactes* (L.), *Pyrrhocorax graculus* (L.) and *Caprimulgus europaeus* L. at Nicopolis-ad-Istrum have more or less incidental origin. As general, the birds of unstated significance for man comprise about 2.0% of the overall number of the osteological material. (The typical sinanthropic birds /next group/ are not included.)

Contemporary synanthropic birds in the ancient settlements

Archaeozoology could actually provide very interesting data on clearing the origin and proceeding of synanthropisation of some animal species in the past — birds in particular. No doubt, the enlargement of settlements, villages and towns and with widening the built up territories in the ancient times, had appeared and developed first urbanistic (anthropogenous) landscape. They were actually providing rather diverse habitats for the bird species (stown walls, parks and gardens with arboreal, shrubby and herbic vegetation, artificial waterholes, etc.). Only a single town, Nicopolis-ad-Istrum, for instance, during the 3rd — 14th century, was inhabited by at least 5 species, which by their contemporary distribution in towns, could be indoubtedly placed in the group of synanthropic birds: *Athene noctua, Sturnus vulgaris* L., *Pica pica* (L.), *Corvus monedula* L., *C. frugilegus* L., *Garrulus glandarius* (L.), and *Passer domesticus* (L.). Apart from the species cited, from the Roman epoch in Kabyle and Armyra, were found remains of white stork — *Ciconia ciconia* (L.) — a very common bird for Bulgarian villages up to the 25 years before. Another wide spread species in the settled territories at present, is the carrion crow (*Corvus corone cornix*), but its bones were established only at the medieval Veliki Preslav.

Special attention to the synantrhropic avian species in Bulgaria in the past, is paid in another work (Boev, 1993). It reveals the approximate periods of the invasion of some of the most common synanthropic birds in the ancient Bulgarian settlements.

Domesticated birds

The widest species variety of domestic birds is found in the medieval Bulgarian capital Veliki Preslav. Literature data and our studies show that at least 5 species of domestic birds were bred during the period 9th to 16th century: goose, duck, fowl, pi-

geon, and turkey. The 32 turkey bones found by Иванов (1959) appear to be the earliest up till now dated find of this species in Bulgaria (Боев, Илиев, 1989, 1991). The presence of turkey have been discovered also in the Middle Age fortress 'Baba Vida' (town of Vidin, 17th century; Боев — под печат). Due to the restricted number of the remainings of ducks and pigeons in some of the sites (Kabyle, Krivnya, Baba Vida, Bela Voda), provides no positive evidence on their domestication status. Domestic guineafowl *Numida meleagris* (L.) has, so far, not been established in the ancient Bulgarian settlements in contrast to peacock (*Pavo cristatus* L.). That species was discovered in the Roman town Nicopolis-ad-Istrum (Боев, 1991) and the find is the only record of peafowl in the Bulgarian archaeological sites.

Despite the paucity of their species composition at the archaeological sites, domestic birds consist the major part of the osteological material of birds. At Nicopolis-ad-Istrum — 58.5% of bird bones remains belong to domestic fowl (Боев, 1991), while in Veliki Preslav they comprise 75.8% (Боев, Илиев, 1991), in Hissarluka — 79.0% (Боев, Рибаров, 1989), and in the Inner Town of Veliki Preslav — 83.6% (Боев, Илиев, 1989).

The structure of poultry and its significance has constantly growing in different villages and during different epochs. According to Богданов (1913) and Доброхотов (1948), the first domestic birds in Europe (duck and goose) have appeared at prime in the neighbouring Greece, about 1 000 — 900 B.C. We can assume the eldest remainings of these species in Bulgaria come from 1st millennium B.C. A total of 4 bones of *Anser anser,* dated of 1 millennium B.C. were found at Maluk Preslavets, Kabile and Yassa-Tepe, but it is doubtable to affirm that if they belong to domesticated forms. Domestic goose, during the period 10th to 12th century A.D. in Hissarluka has provided 19,7 % of the meat of domestic birds (Боев, Рибаров, 1989).

In most of the investigated settlements, the poultry has been based chiefly on domestic fowl. Its relative share in the osteological material of poultry birds estimates at 100% at Nicopolis-ad-Istrum, 94.8% in Veliki Preslav, and 94.4% in Hissarluka. At these settlements, on its behalf has fall 80—100% of the meat, provisioned by poultry.

It is difficult to make assumption over the breed composition of the reared domestic birds. Our data on this topic are more ample only for Nicopolis-ad-Istrum and Veliki Preslav, where at least two different breeds of domestic fowl were found. They are clearly distinguishable in size. For instance, at Veliki Preslav one of the breeds was rather dwarfish — the total length of the tarsometatarsus of an adult female specimen reached about 49.0 mm. Along this breed, a rather numerous and bigger in size breed was reared. The average length of its tarsometatarsus was about 85.0 mm (Боев, Илиев, 1991).

Appearance of the domestic fowl in Bulgaria and on the Balkan Peninsula

As it was mentioned, the eldest remains of *Gallus gallus,* found on Bulgarian lands are related to the 1st millennium B.C. Therefore, the beginning of the poultry breeding can be refered to that period. The bone remains of the domestic fowl from Kabyle (the sanctuary of Zaytchi Vrah), are at present, the eldest ones (7th century A.D.) of any domesticated bird species in Bulgarian lands (BOEV, in press — b).

Utilisation of bird bones

Very small share of the bird bones bear traces of processing. This was probably due to the fact, that materials mainly from the archae- ological sites from historical epoch (Hellenistic — Medievals) are considered in this study. It is known that the manificated bones are found in the Neolithic to Eneolithic settlements predominantly, as well as in the Bronze Age settlements. Only 3 bones (of *Pelecanus onocrotalus,* dated the Early Bronze Age from Urdoviza) bore traces of processing. An ulna and two radii have been accurately cut and the transaction line conforms a regular edge. These bones of wings are pneumatic in pelicans. Thus, they were produced 3 regular tubes, whose application is unknown. On the both tubes, manifactured by radii, are present clear marking of attachment of an covering matter, in which they have been wrapped or inserted in. This indicates, that the tubes were parts of a certain device, used for blowing, inhaling, liquid-spraying of pouring.

Traces on bones

Knife-cuttings most frequently were evident on the surface of the bones. Usually, they are present around the distal epiphyses of the humeri and tibiotarsi. Obviously, the dismembering of bird body has taken place prior to preparing the meal, thus the parts, carrying no flesh bulk (wings endings, legs endings with toes) had been thrown out. Traces of that sort, cuttings in locations mentioned, have been found on bones dated Early Bronze Age, as well as Middle Ages.

Traces of burning of the bird bones, as a rule, are unique. Only four of the bird bones from Nicopolis-ad-Istrum were fire-blackened, while at Urdoviza settlement, 20% of bird bones finds were burned. Presumably, in these cases the way of preparing of bird meat for consuming has been by direct roosting.

Traces left on the surface of bird bones, by the teeth of small carnivores (domestic cats, weasels, polecats, etc.), are found in about 20% of the osteological finds. This is indicating, that after consumption, bird bone remnants have been thrown out, whereabout they have been exposed to these animals, have had access to the fresh food refudge.

Conclusions

The, relatively small numbering of the material collected so far, and scarce publications on bird bone remains in the archaeozoological sites in Bulgarian lands during the last 8 000 years, enables us to draw the following conclusions: Studying of archaeo-ornithological material in Bulgaria has commanced recently. Eighty-five species (25.1% of recent Bulgarian avifauna) of 15 orders were recorded by their subfossil finds. The domestic birds remains are in number prevailing all the rest. In Antiquity and Middle Ages settlings 58.5 to 83.6% of total material belong to them. Six species of domestic birds (fowl, goose, duck, turkey, peacock, and pigeon), with a significant predominance of the domestic fowl everywhere, have been established. At Nicopolis-

ad-Istrum (2nd — 6th century) and Veliki Preslav (9th — 10th century) have been poultried specimens of two different breeds at least. At archaeological sites of historical epoch, the domestic fowl had provided of about 80—100% of the meat, supplied by poultry.

The oldest remains of *Gallus gallus domestica* in Bulgaria are refered to 7th century B.C., these of *Meleagris gallopavo* — to 16th — early 17th century A.D. (one century after its introducing to Europe from America) The group of game birds is presented by 36 species, 24 of them belong to aquatic complex. Fortheen species are waterfowl (anseriform birds), comprising about 50% of meat, harvested by game birds.

From the identified 9 galliform species, two species have been found in Bulgaria at prime — *Tetrao tetrix* by Early Neolithic finds (ca. 6 000 B.C.) and *Pavo cristatus* by a find from Roman epoch. Four disappeared localities of *Tetrao urogallus,* as well as 11 of *Phasianus colchicus colchicus* (the oldest one of which is from 7th century B.C.), were established. As general, in different sites, the wild galliform birds have provided 25—35% from the game-bird meat, while the columbiform species from Roman site reached up to 13%.

Otis tarda has been detected in the eastern parts of the Thracian Lowland — a region, where it has been considered disappeared between 20-ies and 40-ies of the present century, supporting the idea of its former much wider distribution in throughout the country.

At 21 sites and localities were excavated finds of 15 falconiform species and 3 owls. Presumably, *Falco cherrug* and *Hieraetus fasciatus,* have been possibly used as hunting raptor birds in falconery, during the Middle Ages. Raptors, in broad sense, (Falconiformes and Strigiformes) are comprising about 1.86% of the osteological finds at the sites investigated.

Established were also other 9 species, which by their present distribution could be refered to the synanthropic avian complex: *Ciconia ciconia, Athene noctua, Turdus merula, Passer domesticus, Sturnus vulgaris, Pica pica, Corvus monedula, C. frugilegus,* and *C. corone* (*?cornix*).

Manipulated or used birds bones for various purposes are very rare. Three wing bones of *Pelecanus onocrotalus,* used for preparing of tubules with an unknown destination were found. In food-preparation process, wings were cut in the ulnar articulation, while legs — in the tarsal articulation. Normally, bird meat has been cooked using slow fire, or boiling. Sometimes it has been roasted on direct fire. Meat refuge with bones, as general, were rid openwide, not being stocked in garbage pits.

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Златозар БОЕВ

(Р е з ю м е)

Орнитоархеологичното направление е млада интердисциплинарна област на научните изследвания в България. Повечето от наличните сведения са твърде непълни, с неточни определяния на видовете и в повечето случаи само маркират наличието на костни останки от птици в културните пластове.

Представен е подробен преглед на съвременното състояние на изследванията на птиците от археологическите обекти в България от ранния неолит до средновековието. Обхванати са 56 находища (46 от които оригинално изследвани) с общо 5 306 бр. кости и костни фрагменти.

Чрез субфосилните им костни останки са установени най-малко 85 рецентни вида (общо 117 таксона), отнасящи се към 15 разреда (25.1%) от съвременната орнитофауна на България. Най-многобройни сред тях са тези от домашната кокошка (*Gallus gallus domestica*), съставляващи от 58.5 до 83.6% от остеологичния материал в различните находища.

В разни епохи в отделните части на страната като ловни птици са се използвали най-малко 30 вида от разредите Anseriformres и Galliformes. По-редки ловни обекти били дроплите, жеравите и гълъбовите.

За начало на птицевъдството в България следва да се приеме VII в. пр. н. е., откогато датират най-древните находки от домашни птици — домашни кокошки от античния град Кабиле край Ямбол. Със същата възраст са и най-старите останки от колхидския фазан — факт, доказващ несъстоятелността на разпространените в литературата схващания за интродуцирането му на Балканите от Закавказието в по-късно историческо време.

В половината от селищата са установени останки от дневни (и нощни) грабливи птици, най-разпространени сред които са били големият ястреб, ястребовият орел и белоглавият лешояд. Допуска се възможността някои от тях (ловен сокол, голям и малък ястреби, ястребов орел и др.) да са били използвани като обучени за лов хищни птици.

С 4 находки от 2 екземпляра от ранния неолит (около 6 000 г. пр. н. е.) категорично се доказва някогашното разпространение на тетрева по българските земи. Чрез изследването на субфосилните им останки се предоставят първи сведения за миналото разпространение и на някои други изчезнали или застрашени днес видове птици в българската природа — брадат лешояд, розов пеликан, сив жерав, дропла, ястребов орел, глухар, белоглав лешояд и др.

В много редки единични случаи върху повърхността на костите са установени следи от обгаряне. Редки са и следите от разрязване, но винаги в точно определени места от птичия скелет — в областта на дисталните епифизи на раменната и тибиотарзалната кости. Около 1/5 от костите носят следи от нагризване от дребни хищници и гризачи — индикация, че са били безразборно изхвър-

ляни като хранителни отпадъци. Вероятно и затова мършоядните птици (лешояди, вранови и мършоядните патици — ангъчите) са добре представени сред костните находки.

Птичите кости се използвали в миналото като сечива.Това доказват една лакътна и две лъчеви кости от розов пеликан (Урдовиза, ранно-бронзова епоха), от които са били изработени костни тръбички, представляващи част от приспособление с неизяснено предназначение.