

SBORNÍK NÁRODNÍHO MUSEA V PRAZE

ACTA MUSEI NATIONALIS PRAGAE

Vol. IV. B (1948) No. 3.

Geologia et Paleont. No. 2.

REDAKTOR IVAN KLÁŠTERSKÝ

JAR. PETRBOK:

PŘÍSPĚVEK K POZNÁNÍ POSTTERCIERNÍCH MĚKKÝŠŮ BULHARSKA.

A CONTRIBUTION TO THE KNOWLEDGE OF THE POST-TERTIARY
MOLLUSCS OF BULGARIA.

PRAHA 1948

NÁKLADEM NÁRODNÍHO MUSEA V PRAZE

V GENERÁLNÍ KOMISI MATICE ČESKÉ, PRAHA II. - 1700, VÁCLAVSKÉ NÁM.

J A R. P E T R B O K :

Príspevek k poznání posttercierních měkkýšů Bulharska.

**A Contribution to the Knowledge of the Post-Tertiary
Molluscs of Bulgaria.**

(Předloženo 17. IV. 1948.)

Následující studie podává množství nových pozorování z bulharského posttercierního, zejména o nových formách měkkýšů, o dosud neznámých nalezištích a o stratigraficko-chronologických zjištěních. Poprvé je v ní zpracována typologie *Chondrula carneola* ZIEGLER (PROUSSON), *Helicopsis spiruloides* A. J. WAGNER a oba tyto druhy jsou dokázány v bulharském plistocenu; kvarterní fauna v profilu u Ses Sevmes je rozvedena podle vrstev a marinní conchylie vmíšené aeolickou cestou do spraší jsou určeny; je uvedena recentní i fosilní fauna při ústí řeky Osom; je doplněna plistocenní fauna od Svišťova; nové paleolitické naleziště v cihelně „Trud“ u Russe je zprofilováno a určena jeho fauna; podobně také holocenní břeh Dunaje u Russe směrem k Tutakanu. Celkový přehled posttercierní fauny je doplněn novými dodatky. Tím plním svůj slib, který jsem učinil ve své práci *Posttertiaria nonmarina mollusca bulgarica* ve Věstníku královské české společnosti nauk v Praze 1941, na kterou také následující studie přímo navazuje. Jsem si však vědom, že i po všech těchto nových přínosech je tato forma bulharská známa jen velmi málo.

*

In 1941 I published in the “Věstník královské České společnosti nauk” an article entitled: *Posttertiaria nonmarina mollusca bulgarica*. Since then I have worked critically my material of earlier journeys as well as of the journey of 1946. The present article brings some new contributions to the knowledge of the post-Tertiary molluscs of Bulgaria: 475 new units were observed, i. e. forms, localities and stratigraphic-chronological sequences. Further the article gives for the first time the typology of *Chondrula carneola* ZIEGLER

(MOUSSON), *Helicopsis spiruloides* A. J. WAGNER, both these species were found here also in the Pleistocene; the Quaternary fauna in the profile at Ses Sevmes is divided according to beds and the marine conchylia brought by wind action into the loess are determined; the recent and fossil faunas at the mouth of the river Osom are given; the Pleistocene fauna of Svištov is supplemented; a profile is given of the new palaeolithic locality in the brickyard "Trud" at Russe, and its fauna is determined; the Holocene bank of the Danube at Russe in the direction towards Tutakan is also determined; the general survey of the post-Tertiary fauna is supplemented with new important additions. Thus I hope to have fulfilled the promise given in my earlier paper.

But even thus only about 10% of the Bulgarian fauna are known today.

National Museum in Prague, March 1948.

I. Profiles and their Faunas.

a) The Black Sea Region.

1. Pleistocene loesses with a marine fauna at Ses Sevmes.

The profile of 1927¹⁾ is supplemented by the determination of the fauna. Today a similar intrusion of marine conchylia by the wind is possible only on a low shore, into the sand layers of dunes or into contemporary vegetable loam, as far as this not prevented by plant cover.

To Ses Sevmes these conchylia could get as long as the sea extended much farther in the Gulf of Varna, which it did just before the last loess era (without regard to the "loamyfication" of the loess), i. e. in the Würmian. Then followed the retreat of the sea from the gulf which was filled with sand by the surf and subsequently with black earth during the Subboreal Litorinian. The determination of a marine fauna at Ses Sevmes thus yields also evidence for the (youngest geological) history of the Varna Gulf itself.

These marine conchylia occur, however, also in the loesses above the Varna Lake (at Baba Burun, before Peinardžik and perhaps also elsewhere), which proves that the Varna Lake did not exist in the Würmian, or the wind could not have driven the marine conchylia across the water of the lake. In the Würmian, and perhaps also in the Riss-Würmian, the river Provadija ran here in a narrow bed, as is proved by its river terrace on the southern shore of the lake, today eroded by waves.

¹⁾ JAR. PETROK: Plištocenní spraše s marinní faunou u Ses Sevmes („Věstník Stát. geol. ústavu ČSR“, Praha 1927).

Paleontologický přehled fauny kvarterního profilu u Ses Sevmes. Paleontological survey of the fauna of the Quaternary profile at Ses Sevmes.

Geologické období Geol. period	vrstva layer	fauna
historicum	vegetační hnědá hlína brown vegetable loam	<i>Helicella obvia</i> HARTMANN
subbor. Litorinian	černozem (prehisto- rické střepy) black earth (prehistoric fragments)	<i>Cyclostoma elegans</i> MÜLLER
W. Würmian	spraš světlá light loess 2 m	I. 1. <i>Zebrina detrita</i> ; 2. <i>Cyclostoma elegans</i> 1. 4.
W. Würmian	spraš tmavší (zahlinění) darker loess (loamy- fication) 1/4—3/4 m	1. <i>Lucena oblonga var.</i> ; 2. <i>Cyclostoma elegans</i> 1. 4.
W. Würmian	spraš světlá light loess 1 m	1. <i>Helicogena sp. cf. lucorum</i> ; 2. <i>Cyclostoma elegans</i> (frgm. et embr.)
R. W. Rissian- Würmian	spraš tmavá (zahlinění) dark loess 1—3 m (loamy- fication)	1.-2. <i>Polita</i> spp.; 3. <i>Clausilia</i> sp.; 4. <i>Zebrina detrita</i> ; 1.-7. 1. 5. <i>Cyclostoma elegans</i> 7.
R. Rissian	spraš světlá písčítá light sandy loess 2—? m	1. <i>Cerithium vulgatum</i> BRUGIÈRE; 2. <i>Mytilus gallopro- vincialis</i> LAMARK; 3. <i>Venus gallina</i> LINNÉ; 4. <i>Cardium</i> <i>sp. frgm. edulc.</i> LINNÉ; 5. <i>Nassa</i> sp. (suchozemské conchylie v neurčitých zlomcích) (undeterminable fragments of terrestrial conchylia)
?	?	?

2. The Molluscs of the Black Sea Alluvium in the Gulf of Varna.

The Black Sea is an inland sea, and thus every year its tributaries in time of flood bring huge quantities of shells, carry them from place to place, and by the surf they are washed on to the shore. In local floods they are returned to the sea and are carried away by surface currents, weaker or stronger ones, and often changing their direction with the wind.

Thus f. inst. *Chondrula Clessini* RETZ. came already in the Pleistocene from the Crimea (Krym) to Bulgaria and lives abundantly in the sand dunes at Nesebr and elsewhere on the Bulgarian coast; as far as I know it has not yet advanced into the interior. The same applies also to other species, e. g. *Zebrina varnensis* FRIVALDSKY (Pf.), *Zebrina Tournefortiana* FÉRUSSAC, etc. But the latter has not yet been found in the Bulgarian Pleistocene.

It is of course not excluded that still some species of the "Pontian fauna" advanced beyond the basin of the Black Sea, into the Bosphorus, the Marmara Sea, the Dardanelles, Anatolia, etc.

Alluvial fauna:

1. <i>Euconulus fulvus</i> DRAPARNAUD	2 spec.
2. <i>Theba carthusiana</i> MÜLLER	2 spec.
3. <i>Helicogena lucorum</i> MÜLLER	1 spec.
4. <i>Zebrina varnensis</i> FRIVALDSKY (PF.)	62 spec.
5. <i>Zebrina detrita</i> MÜLLER	6 spec.
6. <i>Chondrula Clessini</i> RETOVSKY	75 spec.
7. <i>Chondrula seductilis</i> ZIEGLER (ROSSM.)	83 spec.
8. <i>Chondrula microtragus</i> PARREYS (ROSSM.)	130 spec.
9. <i>Cochlicopa lubrica</i> MÜLLER	1 spec.
10. <i>Tropidiscus marginatus</i> DRAPARNAUD	1 spec.
11. <i>Paraspira septemgyrata</i> ZIEGLER	1 spec.
12. <i>Cyclostoma elegans</i> MÜLLER	15 spec.

b) The Bulgarian Danube Basin.

3. The Molluscs of the Holocene and Recent Alluviums at the Mouth of the River Osom.

The present course of the river Osom is in a cañon, some 4—5 m. deep in Holocene alluvium, which on the right (undercut) bank is eroded so that a perfect profile is formed up to the covering vegetable layer of the homogeneous beds with a predominantly terrestrial fauna.

For the sake of comparison I list here also the fauna of the recent alluvium (April 1928).

Profile: darker vegetable loam: 3—4 dm.
alluvial loams: 4—5 m. Conchylia.

Fauna tato je naplavena při povodních řeky Osom.
This fauna was desosited during the floods of the river Osom.

1. <i>Theba carthusiana</i> MÜLLER	2 spec.
2. <i>Caracolina corcyrensis</i> PARTSCH	6 spec.
3. <i>Helicogena sp. juv. cf. pomatia</i> LINNÉ	1 spec.
4. <i>Clausilia</i> sp.	1 spec.
5. <i>Pupilla muscorum</i> MÜLLER	2 spec.
6. <i>Chondrula seductilis</i> ZIEGLER (ROSSM.)	1 spec.
7. <i>Chondrula microtragus</i> PARREYS (ROSSM.)	5 spec.
8. <i>Chondrula tridens</i> MÜLLER var. <i>eximia</i> ROSSM.	5 spec.
9. <i>Cochlicopa lubrica</i> MÜLLER	1 spec.
10. <i>Lucena oblonga</i> DRAPARNAUD	2 spec.
11. <i>Galba truncatula</i> MÜLLER	1 spec.
12. <i>Coretus corneus</i> LINNÉ	1 spec.
13. <i>Cyclostoma costulata</i> ZIEGLER (ROSSM.)	4 spec.
14. <i>Lithoglyphus naticoides</i> FÉRUSSAC (PF.)	4 spec.
15. <i>Bithinia tentaculata</i> LINNÉ: drobná štíhlá — minute and slim	3 spec.
16. <i>Pisidium</i> sp.	

4. Náplav v ústí řeky Osom.

Deposit at the mouth of the river Osom.²⁾

1. <i>Zonitoides Hammonis</i> STRÖM.	2 spec.
2. <i>Zonitoides nitidus</i> MÜLLER	1 spec.
3. <i>Euconulus trochiformis</i> MONTAGU	1 spec.
4. <i>Eulota fruticum</i> MÜLLER	1 spec.
5. <i>Theba carthusiana</i> MÜLLER (17:11) 13:7 (11:7)	5 spec.
6. <i>Theba carthusiana</i> var.	2 spec.
7. <i>Euomphalia strigella</i> DRAPARNAUD var.	2 spec.
8. <i>Helicella obvia</i> HARTMANN	1 spec.
9. <i>Caracolina corcyrensis</i> PARTSCH	10+2 juv.
10. <i>Caracolina corcyrensis</i> var. <i>girva</i> FRIVALDSKY	11 spec.
11. <i>Clausilia</i> sp.	1 spec.
12. <i>Vallonia pulchella</i> MÜLLER	5 spec.
13. <i>Vallonia costata</i> MÜLLER	3 spec.
14. <i>Pupilla muscorum</i> MÜLLER	21 spec.
15. <i>Pupilla</i> sp.	
16. <i>Orcula doliolum</i> GRUIGÈRE var. <i>turcica</i> aut.	2 spec.
17. <i>Zebrina detrita</i> MÜLLER	2 spec.
18. <i>Zebrina detrita</i> var. <i>primigenia</i> PBK. (fosilní! — fossil)	1 spec.
19. <i>Chondrula seductilis</i> ZIEGLER (ROSSM.)	3 spec.
20. <i>Chondrula microtragus</i> PARREYS (ROSSM.) for	103 spec.

²⁾ pro Bulharsko nový! — new for Bulgaria!

21. <i>Chondrula tridens</i> MÜLLER var. <i>eximia</i> ROSSM.	20 spec.
22. <i>Cochlicopa lubrica</i> MÜLLER	9 spec.
23. <i>Caecilianella acicula</i> MÜLLER	9 spec.
24. <i>Coretus corneus</i> LINNÉ	2 spec.
25. <i>Tropidiscus marginatus</i> DRAPARNAUD	5 spec.
26. <i>Paraspira leucostoma</i> MÜLLER	9 spec.
27. <i>Cyclostoma costulata</i> ZIEGLER (ROSSM.)	1 spec.
28. <i>Bythinia tentaculata</i> LINNÉ	2 spec.
29. <i>Theodoxus transversalis</i> PFEIFFER	1 spec.

5. Plistocenní terasa Dunaje mezi Svištovem a Nikopolí.

Pleistocene terrace of the Danube between Svištov and Nikopolis.

1. <i>Hyalinia</i> sp.	
2. <i>Eulota fruticum</i> MÜLLER (kotouč velmi ostrý — disk very sharp)	2 spec.
3. <i>Tachea austriaca</i> MÜHLFELDT	3 spec.
4. <i>Tachea austriaca</i> f. <i>major</i> PBK. (d = 25, v = 20) rýhovaná — furrowed	1 spec.
5. <i>Caracolina corcyrensis</i> PARTSCH	1 spec.
6. <i>Caracolina corcyrensis</i> var. <i>girva</i> FRIVALDSKY	2 spec.
7. <i>Zebrina detrita</i> MÜLLER	3 (+5 juv.)
8. <i>Zebrina detrita</i> var. <i>primigenia</i> PBK.	3 spec.
9. <i>Chondrula microtragus</i> PARREYSS (ROSSM.)	3 spec.
10. <i>Chondrula tridens</i> MÜLLER	1 spec.
11. <i>Chondrula</i> sp.	1 fgm.
12. <i>Torquilla frumentum</i> DRAPARNAUD.	
13. <i>Coretus corneus</i> LINNÉ	1 spec.
14. <i>Valvata</i> sp. (ze skupiny <i>piscinalis</i> MÜLLER)	
15. <i>Valvata</i> sp.	
16. <i>Lithoglyphus naticoides</i> FÉRUSSAC (PF.)	8 spec.

6. The Molluscs of the Danube Alluvium at Russe.

In July 1914 I collected in the river baths the following fauna, which may however be mixed with fauna brought by the L o m which was then very much in flood. The collection is of course not complete; it has a local value only; nevertheless it contributes to our knowledge of the alluvial association of Danube molluscs.

6. Měkkýši dunajského náplavu u Russe.

V červenci 1914 nasbíral jsem v říčních lázních následující faunu, která však může být i smíšená s faunou přinesenou, tedy velmi rozvod-

něným L o m e m. Sběr není ovšem úplný, má hodnotu místní, ale přispívá k poznání náplavového společenstva měkkýšů podunajských.

1. <i>Zonitoides nitidus</i> MÜLLER	2 spec.
2. <i>Helicella obvia</i> HARTMANN	1 spec.
3. <i>Helicella</i> sp. cf. <i>striata</i> MÜLLER	3 spec.
4. <i>Caracolina corcyrensis</i> PARTSCH	4 spec.
5. <i>Chondrula tridens</i> MÜLLER var. <i>eximia</i> ROSSM.	7 spec.
6. <i>Chondrula microtragus</i> PARREYS (ROSSM.)	9 spec.
7. <i>Cochlicopa lubrica</i> MÜLLER	9 spec.
8. <i>Caecilioides acicula</i> MÜLLER	1 spec.
9. <i>Vallonia costata</i> MÜLLER	1 spec.
10. <i>Pupilla muscorum</i> MÜLLER	5 spec.
11. <i>Pupilla</i> sp.	3 spec.
12. <i>Agardhia</i> spp.	20 spec.
13. <i>Limnaea stagnalis</i> LINNÉ	1 spec.
14. <i>Galba truncatula</i> MÜLLER	1 spec.
15. <i>Tropidiscus marginatus</i> DRAPARNAUD	2 spec.
16. <i>Gyraulus albus</i> MÜLLER	3 spec.
17. <i>Segmentina nitida</i> MÜLLER	1 spec.
18. <i>Carychium minimum</i> MÜLLER	2 spec.
19. <i>Valvata cristata</i> MÜLLER	1 spec.
20. <i>Bithynia tentaculata</i> MÜLLER	6 spec.
21. <i>Lithoglyphus naticoides</i> (FÉRUSSAC) L. PFEIFFER	1 spec.

7. The Pleistocene Molluscs at Svištov on the Danube.

From this Pleistocene I list new finds.³⁾

* marks molluscs from the upper loess (W); the others not horizones.

7. Plistocenní měkkýši u Svištova n. Dunajem.

Z tamnějšího plistocenu uvádím zde nové nálezy.³⁾

* označené jsou ze svrchní spraše (W); ostatní nehorizontováno.

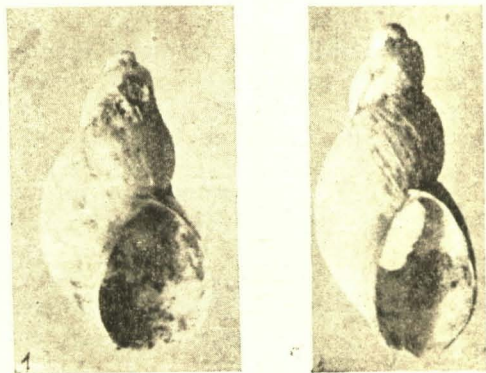
1. *Conulus fulvus* (MÜLLER pr. p.) DRAPARNAUD (= *trochiformis* MONTAGU).

*2. *Helicella* sp.

3. *Helicella obvia* HARTMANN.

³⁾ JAR. PETRBOK: Kvarterní měkkýši u Svištova n. Dunajem („Příroda“, Brno 1940).

4. *Eulota fruticum* MÜLLER.
5. *Vallonia costata* MÜLLER.
6. *Clausilia* sp.
- *7. *Clausilia* sp.
8. *Chondrula seductilis* (ZIEGLER) ROSSMAESSLER.
- *9. *Chondrula tridens* MÜLLER.
10. *Torquilla frumentum* DRAPARNAUD.
11. *Pupilla* sp.
- *12. *Lucena Chr. Botjovi* sp. n.
- *13. *Lucena Chr. Botjovi* sp. n. var. *elongata* var. n.



1. *Lucena Christo Botjovi* sp. n. ($\frac{1}{11} = 5$ mm).
 2. *Lucena Christo Botjovi* sp. n. var. *elongata*, v. n.
 hab.: Svištov n. Dunaji, plisticen: svrchní spraš.
 Pleistocene: upper loess.

Lucena Christo-Botjovi sp. n.

Shell minute, slim, only 5 mm. high and 2 mm. wide, with $3\frac{1}{2}$ windings, of which the embryonal one is deflected; the second and third are very convex. The aperture reached to half the height of the shell. The furrows of growth are rib-like; rim of the columella with callus.

Testa parvula gracili, solum 5 mm. longa et 2 mm. lata, anfractis umbilicis $3\frac{1}{2}$ volata, quorum illo embryonali deflexo, secundo et tertio valdeconvexis. Apertura medium longitudinis testae attingente. Strigis crescitorus fere costiformibus; margine columellae cum callus.

Var. *elongata* var. n.

differs from the type by its slimness. H. $4\frac{1}{2}$ mm. W. $1\frac{3}{4}$ mm.

A typo gracilitate conspicua divergens.

Lucena Christo Botjovi sp. n. is the slimmest *Succinea* of the European Pleistocene.

Pleistocenní fauna od Svištova nad Dunajem.
 Pleistocene Fauna of Svištov on the Danube.

	Druh Species	Pleistocene	
		svrchní spraš upper loess (w.)	nehorizon- továno non- horizoned
1	<i>Conulus fulvus</i> (Müller pr. p.) DRAPARNAUD (= <i>trochiformis</i> Montagu)		•
2	<i>Helicella</i> sp.	•	
3	<i>Helicella obvia</i> HARTMANN		•
4	<i>Camphylaea trizona</i> ZIEGLER (ROSSM.) var. <i>Bončevi</i> PETRBOK		•
5	<i>Euomphalia strigella</i> DRAPARNAUD f. <i>typica</i>		•
6	<i>Euomphalia strigella</i> DRAPARNAUD cf. f. <i>major</i>		•
7	<i>Euomphalia strigella</i> DRAPARNAUD var. <i>excentrica</i> var. n.		•
8	<i>Tachea austriaca</i> MÜHLFELDT var. <i>pallescens</i> ZIEGLER		•
9	<i>Eulota fruticum</i> MÜLLER		•
10	<i>Vallonia costata</i> MÜLLER		•
11	<i>Clausilia</i> sp.	•	
12	<i>Clausilia</i> sp.		•
13	<i>Chondrula seductilis</i> ZIEGLER (ROSSM.)		•
14	<i>Chondrula tridens</i> MÜLLER	•	
15	<i>Torquilla frumentum</i> DRAPARNAUD		•
16	<i>Pupilla</i> sp.	•	
17	<i>Lucena Christo Botjovi</i> sp. n.	•	
18	<i>Lucena Christo Botjovi</i> var. <i>elongata</i> var. n.	•	

8. New Molluscs of the Subboreal Litorinian at Svištov on the Danube.

1. *Polita* sp.
2. *Eulota fruticum* MÜLLER.
3. *Helicella* sp. cf. *striata* MÜLLER.
4. *Helicella obvia* HARTMANN.
5. *Theba* sp.
6. *Zebrina seductilis* ZIEGLER (ROSSM.).
7. *Chondrula detrita* MÜLLER.

All these forms are from Neolithic beds.

9. Pleistocene Molluscs at Vardin on the Danube.

- | | |
|---|----|
| 1. <i>Vallonia</i> sp. | 1 |
| 2. <i>Caracolina corcyrensis</i> PARTSCH | 1 |
| 3. <i>Helicella</i> sp. | 11 |
| 4. <i>Chondrula tridens</i> MÜLLER | 1 |
| 5. <i>Chondrula seductilis</i> ZIEGLER (ROSSM.) | 2 |
| 6. <i>Lucena oblonga</i> DRAPARNAUD var. <i>elongata</i> A. BRAUN | 2 |

Profile:

(Holocene covering layers.)

Pleistocene: loess (W.): 4—5 m., Conchylia.

The fauna listed above is therefore exclusively from the upper loess (W.). Incomplete collection.

10. Profil pleistocenem v cihelně „Trud“ u Russe.

Profile of the Pleistocene in the brickyard „Trud“ at Russe.



Russe: cihelna „Trud“; paleolitický nástroj (1/1), zahlinění černozemí.
Russe: brickyard „Trud“; one paleolithic-implement (1/1) from the first blackearth loamyfication.

This profile is important not only for the fauna of its lower layers, which as an association is so different from that of the upper layers, but also because I found on the Pleistocene Danube terrace one Palaeo-

lithic implement (and another similar to a flint) of the same material as at Russe⁴⁾ under the brewery called „Petka“.

Holocenní krycí vrstvy v černozemi (= subboreal, litorinien): <i>Helicella obvia</i> Hartmann	
vrstva layer	nález finds
III. spraš loess	1., 2.: <i>Helicella</i> spp. (<i>Mamonteus primigenius</i> BLB západně od „Petky“). west of „Petka“
III. zahlinění černozemí black earth loamyfication	?
II. spraš loess	?
II. zahlinění černozemí loamyfication of black earth	1. <i>Helicogena pomatia</i> LINNÉ 2. <i>Helicogena lutescens</i> (ZIEGLER) ROSSM. 3. <i>Tachea austriaca</i> MÜHLFELDT
I. spraš loess	1., 2.: <i>Helicella</i> spp. 3. <i>Helicogena pomatia</i> LINNÉ 4. <i>Chondrula tridens</i> MÜLLER 5. <i>Chondrula tridens</i> var. <i>eximia</i> ROSSM.
I. zahlinění černozemí loamyfication of black earth	1. <i>Helicella</i> sp. 2. <i>Chondrula tridens</i> MÜLLER 3. <i>Chondrula microtragus</i> (P.) ROSSM. „Paleolithicum“ 4. ? <i>Valvata</i> sp. juv.
terasa Dunaje: (štěrky, písek, jíly) Danube terrace (gravels, sands, clays)	

Here, too, this Palaeolith, probably of Aurignacian age, occurs in the lower layers on a terrace, but the loams between the loesses have not that characteristic colouring they have in the brickyard „Trud“.

This find indicates the desirability of a thorough and systematic investigation of the Danube Pleistocene in general.

⁴⁾ JAR. PETRBOK: Stratigrafie a paleontologie paleolitického naleziště v Russe („Věstník Stát. geol. ústavu ČSR“, Praha 1925).

11. Profile through the Holocene of the Danube bank at Russe.

According to the above the historical development of this Holocene fauna is as follows:

Druh Species	terasová hlína terrace loam F1	světlá hlína šedá light gray loam	černozem 1 black earth	světlá hlína šedá light gray loam	černozem 2 black earth	světlá hlína šedá light gray loam	černozem 1 black earth	světlá hlína šedá light gray loam
<i>Helicella</i> sp.			•			•		
<i>Tachea austriaca</i> MÜHLFELDT			•			•		•
<i>Helicogena pomatia</i> LINNÉ			•	•	•	•		•
<i>Eulota fruticum</i> MÜLLER	•							
<i>Chondrula tridens</i> MÜLLER							•	
<i>Limnophysa palustris</i> MÜLLER	•							
<i>Succinea</i> sp.		•						
<i>Coretus corneus</i> LINNÉ		•	•	•	•	•		
<i>Tropidiscus marginatus</i> DRAPARNAUD	•							
sp.		•	•			•		
<i>Gyraulus</i>		•						
<i>Paludina danubialis</i> BOURGUIGNAT var. <i>Penchinati</i> B.	•	•			•			
<i>Paludina vivipara</i> LINNÉ								
<i>Bythinia tentaculata</i> LINNÉ	•			•		•		
<i>Valvata</i> sp.				•		•		
<i>Lithoglyphus naticoides</i> FÉRUSSAC		•						
<i>Unio</i> sp.						•		

In August 1922 the water level of the Danube at Russe was so low, that it was possible to determine the profile of this bank still 2 m. deeper than was possible in July and August 1925, in April 1928, and in July 1932.

The photograph given of this very important locality dates therefore from 1922, and it was only in that year that the fauna of the lower layers could be determined. But the still lower layers have up till now not been found anywhere and could only be found by boring, as the Danube is not likely to change its present undercut banks here.

The whole profile is thus as follows:

light gray vegetable loam: 2 dm + x dm =	Historicum	F
black earth (3):	1—2 dm layer of	F
light gray loam	6 dm	Subboreal
main layer of black earth (2)	6 dm the development	F
		Litorinian
light gray loam	5 dm of black earth	
black earth (1)	2 dm	F
light gray loam	4 dm	F ₂
terrace layer of loam:	3 m.: main <i>Paludina</i> layer	F ₁

II. Supplements of the Fauna and Localities.

Polita cellaria MÜLLER.

1. °Izvor sv. Anny above the Lake of Varna: Roman culture pit.

Punctum pygmaeum DRAPARNAUD.

1. °Carevō grada (= Vasiliko); 2. °Galata: alluvium. Both localities for the first time in the (Bulgarian) Black Sea region.

Eulota fruticum MÜLLER.

1. °Russe: bank of the Danube: Lower Holocene.

Helicella striata MÜLLER.

1. °Svištovo on the Danube: black earth = Subboreal Litorinian.

Helicopsis variabilis DRAPARNAUD.

1. °Sozopol a) recent; b) fjords. α recent, β Litorinian s. l., γ recent island; 2. °Carevō grada: black earth = Subboreal Litorinian (Profiles II and III). 3. °Čimovo rec., 4. °Varna fisherman's hut: black earth = Subboreal Litorinian. °f. minor f. n. (+ 11: 8), recent.

Helicella spiruloides (A. J. WAGNER) P. HESSE.⁵⁾

1. *forma typica*: l. = 11,5, h. = 5,5; striped shell. I have not found one such flat form among 148 shells. Perhaps it is a misprint. My flattest shell was 13:7. All the others were higher and formed transition to 2. *sbf. conoidea* sbf. n.: 14:11 (+ 12:9½, etc.). As the high shells (though not achieving the shape of *sbf. conoidea*) are the most numerous, I consider WAGNER'S type to be 3. *sbf. depressa* sbf. n. Besides there is still *f. minor* f. n., 9½:6.

Colour aberrations: 1. the type is striped = *ab. fasciata* ab. n.; the widest stripe is above the centre of the coil and runs nearly across the whole disk; it is light or dark brown. Above it is usually a thinner stripe, often interrupted; under it is one thinner, often interrupted one, and often towards the fistula are still several others, of hair's breadth, again interrupted. In *ab. pallescens* ab. n. these stripes are transparent. *Ab. efasciata* is pure white, without stripes.

Helicopsis spiruloides A. J. WAGNER:

Recent: 1. Varna (golf); 2. Carska reka (dunes); 3. Nesebr (dunes); 4. Kardis near Nesebr; 5. Hadžidere near Nesebr; 6. Ravda on the sea; 7. Arkutino Lake; 8. Sozopol; 9. Carevō grada; 10. Galata near Varna.

Holocene: 1. Kurbej near Devna: travertine: Atlantic Litorinian; 2. Nesebr: Subboreal Litorinian; 3. Hadžidere near Nesebr: stream terrace (unhorizons); 4. Ravda: a) black earth = Subboreal Litorinian; b) transition bed to the Pleistocene; 5. Čimovo: black earth = Subboreal Litorinian; 6. Carevō grada: a) yellow sandy loam: Post-Subboreal Litorinian, b) black earth: Subboreal Litorinian; 7. ? Kavarna: travertine: Atlantic Litorinian (1 defective shell); 8. Džanavartepe: *subf. conoidea* subf. n.

Pleistocene: 1. Nesebr: Pleistocene loess W.; 2. Ravda: Pleistocene loess W.; 3. Varna (barracks): Pleistocene loess W.; 4. Galata near Varna: Pleistocene loess W.; 5. Peinardžik above the Lake of Varna: Pleistocene loess W. *subf. conoidea*.

Thus the whole morphological circle is:

1. for. *typica*.
2. sbfor. *depressa* (originally the type noldena) n.
3. sbfor. *conoidea* subf. n.
4. for. *minor* f. n.

With aberrations:

- a) *fasciata* n.
- b) *pallescens* n.
- c) *efasciata* n.

and of course with a combination of all these characteristics.

⁵⁾ P. HESSE: Mollusken von Varna und Umgebung („Nachrichtsblatt der Deutschen Malakozoologischen Gesellschaft“, Frankfurt a. M. 1916, p. 149).

Historický tvarový okruh pro Bulharsko.
Historical and morphological circle for Bulgaria.

Geologické období Geological period	<i>f. typica</i>	<i>f. depressa</i>	<i>f. conoidea</i>	<i>f. minor</i>	<i>aberratio fasciata</i>	<i>ab. pallescens</i>	<i>ab. efasciata</i>
Recent	•	•	•	•	•	•	•
Historicum (ranné i pozdní) (early and late)				•	•		•
Litorinien subboreální Subboreal Litorinian	•	•	•		•		•
Litorinien atlantický Atlantic Litorinian	•						•
Přechod z pliocenu Transition from the Pleistocene	•		•	•	•	•	
Pleistocen: spraš (W). Pleistocene: loess	•		•		•		•

Helicella obvia HARTMANN.

1. Lake of Varna: limestone quarry; 2. Gebedže: *ab. pallescens* ab. n.; 3. Vidin: Litorinian s. l.; 4. Svištov on the Danube: white shells; 5. Kunino: cave: Neolithic; 6. Ravda on the sea: a) black earth = Subboreal Litorinian; b) Pleistocene: loess (W.).

Helicella obvia HARTMANN *ab. pallescens* n.

1. Dekilitaše near Varna: with transparent stripes!

Euomphalia strigella DRAPARNAUD *var. excentrica* var. n.

Svištov on the Danube: Pleistocene = loess (W.).

It differs from the type by the last winding being deflected from the disk.

Theba carthusiana MÜLLER.

1. Devna (railway line) yellow loam = Atlantic Litorinian; 2. Galata: Atlantic Litorinian: travertine in the gulf at the stream; 3. Tašlar Tepe: black earth = Subboreal Litorinian; 4. Carevō grada: type (12:8) + *f. minor* (+ 10:6½); — *f. minutissima* (— 9:6½); 5. Čimovo; 6. Sozopol: a) island; b) fjords (recent); c) fjords = Litorinian s. l.; 7. Arabčužma: Greek culture pit; 8. Nesebr (recent); 9. Gebedže: a) sand dunes at Dekilitaše; 10. Bela on the sea; 11. Svištov on the Danube: Atlantic Litorinian: travertine; 12. Russe: Pleistocene loess (W.).

Theba frequens MOUSSON.

Listed up till now: Recent: 0 Varna, 0 Galata, 0 Lake of Varna, 0 Bela on the sea, Svištov on the Danube; furthermore collected: Recent: 1. Ravda on the sea; 2. Aitos (18:12) + *f. minor* f. n. (15:9½) differt a typo testa minore; 3. Nesebr + subf. *conoidea* sub. f. n. differt a typo testa coniformi; 4. Arkutino Lake; 5. Tašlar Tepe near Varna; Holocene: Tašlar Tepe near Varna: ? Subboreal Litorinian; 0 Carevo-grada (Subboreal Litorinian); Pleistocene:

1. Galata: loess: Würmian; 2. Nesebr: loess = Würmian.

Form	Recent Locality	Holocene	Pleistocene
<i>f. typica</i>	Varna, Galata, Bela, Aitos, Nesebr, Arkutino, Tašlar Tepe, Ravda	Tašlar Tepe (Subbor. Litorinian) Svištov on the Danube (unhorizontes) Varna (dtto), Bela	Galata (Würmian) Nesebr (dtto)
<i>f. minor</i>	AITOS	—	—
subf. <i>conoidea</i>	NESEBR	—	—

Cattania Pellii HESSE *f. minor* f. n.

smaller shell (17:10+) than the type (21:13). Differt a typo testa minore. 0 Plovdiv.

Cattania trizona ZIEGLER (ROSSM.) var. *rumelica* ZIEGLER ap. ROSSM.

1. 0 Gabrovsky Monastyr.

Caracolina corcyrensis PARTSCH.

1. 0 Gebedže Lake: Subboreal Litorinian; 2. Galata: alluvium.

Helicogena pomatia LINNÉ.

1. 0 Konstantin Monastyr: unhorizontes Holocene; 2. var.: 0 Vidin on the Danube (recent): low disk (h. = 37, h. of the aperture = 30!); 3. Jantra: black earth = Subboreal Litorinian.

Helicogena lucorum LINNÉ.

Recent: 1. Galata near Varna; 2. Ses Sevmes; 3. Carska reka: dunes; 4. Primorska; 5. var.: Sozopol (low, strong-walled).

Holocene: 1. Konstantin Monastyr: Subboreal Litorinian (36:32); 2. Galata: a) unhorizontes; b) black earth = Subboreal Litorinian; 4. Čimovo; 5. Kavarna (Atlantic Litorinian).

Pleistocene: 1. Galata: unhorizontes in terrace eluvium of the Pliocene. First find in the Pleistocene for Bulgaria.

Tachea austriaca MÜHLFELD.

Recent: 1. Sultanalar: a) type (28:8); b) *subf. conoidea* (23:21); 2. Galata: a) var. *pallescens* FÉR. (one shell with stripes that disappear here and there); b) type (40 shells); 3. *subf. conoidea* (20:20); d) *f. major* (25:22); 3. Tiča valley (= Tiča dere);

4. Ravda on the sea: a) type; b) *subf. conoidea*; c) *f. minor (bulgarica)* 21:17; 5. Primorska (= Kuprije); 6. Tašlar Tepe.

Holocene: 1. Galata near Varna: a) Subboreal Litorinian; b) *f. major* (Gab.) (26:22); 2. Russe: bank of the Danube — upper gray loam (23:17), therefore a depressed form ("*f. depressa*"); 3. Gebedženske Lake: Subboreal Litorinian (21:18); 4. Konstantin Monastyr: upper white loam; 5. Tašlar Tepe: black earth = Subboreal Litorinian; 6. Russe ("*f. depressa*"), white loam = bank of the Danube; 7. Vidin: Litorinian s. l.; 8. Jantra at its junction with the Danube, a) Subboreal, Litorinian; b) *f. minor (bulgarica)* 22:17; c) var. *pallescens* FÉR., major, ("*costulata* WOLLBEREDT"), *conoidea* (25½:22½); 9. Kavarna: travertine = Atlantic Litorinian; 10. Čimovo: black earth = Subboreal Litorinian.

Pleistocene: 1. Galata: a) ? var. n. (damaged shell insufficient for a final diagnosis); b) Pleistocene with Tertiary eluvium; 5. shells, one *subf. conoidea* 22:19.

Remarks: *Tachea austriaca* MÜHLFELD is in Bulgaria a beautifully developed species which perhaps reaches here (of course also with the environment) the height of development of its forms. Thus 1. *f. major* (25:22) differs from var. *gigas* FRANKENBERGER (28:23) of Mermer Kulé especially by its thin walls.

II. *f. minor (bulgarica)* (21:17) need not be identical with *f. minor* (18:16) known before, as it derives from a larger (Bulgarian, better littoral) race; therefore I wish to name it in the above way.

III. (*subf. depressa*) is a depressed form, the counterpart of *subf. conoidea*.

IV. the form listed from Jantra combines four forms listed separately (three if we leave out var. *costulata*, as obvious). Then it should have its proper name.

Accordingly the sequence of the Bulgarian forms is provisionally as follows:

f. minor — (*bulgarica*)

```

      |
      | f. typica:
      |
      | subf. conoidea
      |
      | (subf. depressa)
      |
      | ab. pallescens FÉR.
      |
      | f. subdentata PETRBOK (Galac)
      |
      | +
      | (f. major)
      | var. gigas FRANKENBERGER
      |
      | f. tičiensis PETRBOK
      |
      | (f. jantraensis) PETRBOK
    
```

This is not a philatelic game of creating "new names", but an understanding of the biological manifestations of a given geographical race. All this is only the preparation for final conclusions which can be reached only after obtaining a huge material from the whole area of the species in question.

Today the Bohemian *Tachea austriaca* MÜHLFELD can never form either the *f. major* or the *var. gigas* of Bulgaria (and neighbourhood), because these forms derive from a special geographical race, where the Bulgarian *f. typica* is for Bohemia already a "*f. major*". (If such a shell were to be found in Bohemia, it would represent a case of individual gigantism).

Zebrina varnensis FRIVALDSKY.

Recent: 1. Galata polymorphic (18:5½, 18¼:5¼, 22:6½, 24:6, etc); 2. Kavarna.

Holocene: Kavarna: Atlantic Litorinian — travertine.

Remark: Up till now this species is not known in the Pleistocene from anywhere except from Galata, together with *Helicopsis spiruloides* A. J. WAGNER, *Chondrula microtragus* PARREYSS.

Though W. KOBELT ("Iconografie" etc. figs 1337—9) figured already in 1877 three forms of this species, he had no such dwarfed material (only 20:5) as that from the Atlantic Litorinian of Kavarna 15:5, +15:5, 15½:5, +15:—5, 15: +5, which can be described as *f. minor* f. n.; further 15½:6, 18:6, but again 21:5¼, 22:6½, the largest (from Varna) being 26:7.

Pleistocene from the loess (W.) 18:6, +18:6, +17:6, 20: +6, 20:—6, at Galata; the smaller dimensions predominate.

Accordingly the historical development of this species appears as follows:

Geologické období Geological period	Naleziště Locality	Poznámka Remark
Recentní Recent	1. Aladža monastery; 2. Varna; 3. Tiča dere; 4. Sozopol; 5. Kestrič; 6. Čerepišky mona- styr; 7. Galata.	
Historicum Historicum	01. Čifte dere	
Litorinien subboreální Subboreal Litorinian	1. Konstantyn monastery	černozem black earth
Litorinien atlantický Atlantic Litorinian	1. Kavarna	po prvé i f. minor for the first time also f. minor
Plistocen: spraš (W). Pleistocene: Loess (W).	01. Galata	

Zebrina detrita MÜLLER.

Recent: 1. Sv. Vrač + *var.*, *radiata* PFEIF.; 2. Kavarna + *var. radiata* PFEIF.; 3. Šumla (Kar. Polak).

Holocene: 1. Galata: Subboreal Litorinian; 2. Kavarna: Atlantic Litorinian, travertine.

Pleistocene: 1. Galata: Pleistocene rain-wash with Tertiary eluvium; 2. Ses Sevmes: loess (W.).

Chondrula carneola ZIEGLER.

Syn.: *Buliminus reversalis* var. KOBELT = *Buliminus pupa* BRUGIÈRE var. *nana* PFEIFER = *Chondrula (Mastus) pupa* BRUGIÈRE, var. *carneola* MOUSSON (STURANY 1914).

Localities formerly listed: Cañihrad (=Istanbul) (KOBELT 1877, "Iconograf." etc.); Slivno (STURANY 1914, "Üb. schalentrag. Landmollusken" etc.); Jaln Tepe near Kadikeje (HESSE 1914, "Z. K. d. Molluskenf. v. Ostrumelien"); furthermore: Euxinograd, Čerepisky Monastery, Burgas, Malko Trnovo.

My own localities: 1. Bela on the sea; 2. Carevo grada (=Vasiliko); 3. Eskičušme dere; 4. Varna: gulf, therefore littoral of the Black Sea.

Morphological circle:

- Chondrula carneola* ZIEGLER f. *typica* ZIEGLER.
- Chondrula carneola* ZIEGLER var. *robusta* PETRBOK.
- Chondrula carneola* ZIEGLER var. *Gočevi* PETRBOK.
- Chondrula carneola* ZIEGLER f. *elongata* PETRBOK.
- Chondrula carneola* ZIEGLER ab. *pallescens* PETRBOK.

1. *Chondrula carneola* Ziegler f. *typica* ZIEGLER.

Dimension of the type:

- 10—12: 4 mm. (Westerlund).
12: 5,5 mm. (Sturany).
12: 5 mm. (Petrbok: Bela on the sea).
—13: 6½ mm. (Petrbok: Carevo).
13: +5 mm.
+13: 5 mm. (Petrbok: Eskičušme dere (Subbor. Litorinian)).

Pfeiffer and Kobelt saw in this form a "diminutive" *Buliminus pupa* BRUGIÈRE (and therefore Pfeiffer saw in it a dwarfed form of *Buliminus pupa* BRUGIÈRE); but even in its *f. minor*⁷⁾ (9⅔—10½:4¼—5½) *Buliminus (Mastus) pupa* BRUGIÈRE is broader than *Chondrula carneola* ZIEGLER.

2. *Chondrula carneola* ZIEGLER var. *robusta* var. *n.*

Differt a typo testa majore et robusta.

It differs from the type in size and in strength of shell (29 specimens) 16:6, 17:6, 15: +6, 16⅔:6.

The other 15 specimens from this locality are on the whole transition forms. From this it is evident that *var. robusta* PBK. is the real type, whereas *f. typica*, originally described, is a diminutive form!

2a. *Chondrula carneola* ZIEGLER var. *robusta* var. *n. f. bituberculata* f. n. has on the spine behind the normal tubercle still a second smaller one.

⁷⁾ *f. Ludovici Salvatori* PBK. from Sicily combines *f. minor* and *f. etuberculatus* (13:6) against

In pariete medians tuberculum parietale reduplicatum tuberculum secundum profundius positum minor forte.

3. *Chondrula carneola* ZIEGLER var. *Gočevi* var. n.

It differs from the type in its dimensions (= var. *robusta* PBK; 15:6) and the lack of a tubercle.

Differt a typo testa majore atque tuberculo angulari deficiente. One shell among the 45 mentioned sub 2).

From the upper loess (W) at Baba Burun above the Lake of Varna (2 shells) and thus the earliest form of *Chondrula carneola* ZIEGLER.

4. *Chondrula carneola* ZIEGLER f. *elongata* f. n.

+14:5; differs from the type by the slimness of the shell.

Differt a typo testa prolongata.

One shell in yellow sandy loam (Carevo) under black earth, therefore Litorinian, probably Atlantic.

5. *Chondrula carneola* ZIEGLER ab. *pallescens* ab. n.

Differs from the type by its translucent shell (14½: +5).

Differt a typo testa pallescente.

Celkový přehled je tedy následující:
The total survey is therefore as follows:

<i>Chondrula carneola</i> ZIEGLER	Recent:	Historicum:	black earth = černozem = Subboreal Litorinian:	yellow loam žlutá hlína Atlantic Litorinian:	spraš W. Pleistoc.
f. <i>typica</i> ZIEGLER	Bela n. mořem on the sea Varna (zátoka) gulf Uzun-Kum. on the sea	Carevo (grada)	Carevo (grada) Eski-čušmedere	Carevo (grada)	Baba Burun
var. <i>robusta</i> PBK.	Bela n. mořem Eski-čušmedere Varna (zátoka) gulf				
var. <i>robusta</i> for. <i>bituberculata</i> PBK.	Varna (zátoka) gulf				
var. <i>Gočevi</i> PBK.	Varna (zátoka) gulf				
f. <i>elongata</i> PBK.				Carevo (grada)	
ab. <i>pallescens</i> PBK.	Bela n. mořem (12:5) on the sea	Carevo (grada) (14½:5)			

Chondrula Clessini RETOVSKY.

In the diagnosis of this species 6—8 teeth are given. Thus is included three forms:

1. *sexdentata*,
2. *septemdentata*,
3. *octodentata*

as they are distinguished f. inst. in *Alaea antivertigo* DRAPARNAUD. It has not been stated which of them is taken as type of *Ch. Clessini* RET.

The dimensions are given as 4—6½:2½—3⅔ mm. Again it has not been stated whether all these forms according to size occur together or derive from different places, though perhaps of the same locality (i. e. Crimea [Krym], at Sudak and Theodosia).

The material from Bulgaria yielded the following forms:

1. *Chondrula Clessini* RETOVSKY f. *sexdentata*
 2. *Chondrula Clessini* RETOVSKY f. *septemdentata*
 3. *Chondrula Clessini* RETOVSKY f. *octodentata*
 4. *Chondrula Clessini* RETOVSKY f. *minor*
 5. *Chondrula Clessini* RETOVSKY ab. *pallescens*
- } biological forms
} physiological forms

I consider *forma septemdentata* the type, because it is the most abundant.

6. *Chondrula Clessini* RETOVSKY f. *curta* f. n.

Up till now I have collected *Chondrula Clessini* RETOVSKY exclusively on the shores of the Black Sea: Nesebr (= Mesembrie), mouth of the Tiča, Bela on the sea, Varna — gulf, Varna Lake, Peinardžik, Uzun-kum.

The specimens living in the dunes at Nesebr are completely pallescent (therefore ab. *pallescens* ab. n.), 5—6 mm. high, thin-walled, and I consider them dwarfed in comparison with the others (*f. minor*). I see in this form a physiological manifestation! Tubercle at the aperture on the spine reduced; therefore *f. sexdentata*. Six specimens. The specimens from the same place, but from the underlying loam are not pallescent; the shell in strong, the tubercle developed (three specimens); therefore *f. septemdentata*. The Pleistocene (Würmian) shells have strong walls as they lived in a loamy country.

Some shells have a depressed disk, 5:3½, so that they are reminiscent of *f. curta* in *Orcula doliolum* BRUGIÈRE.

Sudak and Theodosia in the Crimea (Krym) are given as its home. Its spread in the Black Sea region is known up till now from the Riss-Würmian (Nesebr). Its physiological forms: *f. minor* and ab. *pallescens* are known up till now only from recent dunes (Nesebr).

Historický sled *Chondrula Clesini* RETOVSKY v Bulharsku.
Historical sequence of *Chondrula Clesini* RETOVSKY in Bulgaria.

Vrstva Bed	Geolog. období Geological period	Naleziště Locality
	dnešek recent	<i>Nesebr; ústí Tiči; Bela n. mořem; Varna; Varna: zátoka (náplav); Uzun-Kum; Varnenské jezero (se všemi formami); (Sudak Theodesia na Krymu). Nesebr; mouth of the Tiči; Bela on the sea; Varna; Varna: gulf (aluv); Uzun-Kum; Varna Lake (with all forms); (Sudak and Theodesia in the Crimea).</i>
černozem black earth	litorinien subboreální subboreal Litorinian	<i>Varnenské jezero Varna Lake</i>
spraš loess	Würmian	<i>Nesebr; Peinardžik</i>
černozem black earth	Riss- Würmian	<i>Nesebr</i>

Chondrula microtragus PARREYSS (ROSSM.).

Recent: 1. Galata near Varna; 2. Konstantin Monastyr; 3. Varna Lake shore *f. minor* (h = 8 mm.); 4. Bela on the sea, dunes: *ab. pallescens ab. n.*

Holocene: 1. Hadžidere near Nesebr (unhorizoned); 2. Galata, gulf at the stream, Atlantic Litorinian — travertine; 3. Ravda on the sea: Subboreal Litorinian — black earth (and Neolithic pits); 4. Sozopol: Greek culture pit (fragments with palmetta); 5. Kunino: Neolithicum in caves; 6. Kavarna: Atlantic Litorinian — travertine.

Pleistocene: 1. Ravda: loess (Würmian); 2. Eski čušme dere: loess (Würmian).

Morphological and historical circle for Bulgaria:

Chondrula microtragus PARREYSS *ab. pallescens ab. n.*

differt a typo testa pallescente.

Chondrula seductilis ZIEGLER (ROSSM.).

Recent: 1. Eski čušme dere; 2. Varna Lake: alluvium (polymorphic).

Holocene: 1. Sozopol-fjords: Litorinian s. l.; 2. Ravda on the sea, Subboreal Litorinian — black earth.

Pleistocene: 1. Baba Burun on the Varna Lake: loess (W); 2. Russe — brickyard: loess (W).

Geologické období Geological period	Naleziště Locality	Forma Form
Recent	Džumaja, Šumla, Trnovo, Kušbunar, Loveč, Sevlievo, Marica, Lozensky monastyr, Kadikej, °Varna, °Varnenské jezero, °Russe, °Kula u Russe, °Lom Palanka, °Svištov, °Uzun-Kum, °Bela n. m., °Nesebr, °Sveti Vlas, °Kardis (Nesebr), °Hadži dere (ibid.), °Ravda, °Sozopol, °Tiča dere, Plovdiv, Pleven, Kajaluka dere, Dli dere (Rhodope), Tašlar Tepe, °Džanavar Tepe, °Euxinograd, °Aladža mon., °Galata u Varny, °Konstantin monastyr, Varnenské jezero, Bela n. mořem	<i>f. typica f. minor f. major ab. pallescens (var. mutatus WESTERLUND localita=?)</i>
Historicum	1. °Ses Sevmes, 2. °Sozopol,	<i>f. typica</i>
Nehorizontov. Unhorizoned	°Hadžidere, °Kurbej, °Bezdan,	<i>f. typica f. major</i>
Subboreální litorinien: černozem Subboreal Litorinien: black earth	°Ravda, °Kunino, °Peinardžik, °Čimovo, °Svištov, °Devna, °Nesebr, (f. m.), °Tašlar Tepe, °Russe (mohyla), °Varnenské jezero Varna Lake	<i>f. typica f. minor</i>
Atlantický litorinien: travertine Atlantíc Litorinien: neoliticum	°Galata, °Kavarna, °Kastrič, °Devna	<i>f. typica</i>
Würmian spraš loess	°Ravda, °Eski čušma dere, °Tašlar Tepe, Dekilitaš, °Galata, °Russe [a) mamut, b) cihelna, c) paleolit], °Nesebr, °Peinardžik, °Belevo (=Gebedže)	<i>f. typica</i>

Chondrula tridens MÜLLER *var. eximia* ROSSMAESSLER.

Recent: 1. °Varna Lake; 2. °Bela on the sea.

Pleistocene: 1. °Galata: loess (W); 2. °Lom Palanka: loess (W).

Caecilioides acicula MÜLLER.

Recent: Galata — gulf: alluvium.

Holocene: Konstantin Monastyr: Atlantic Litorinian — white loam.

Cochlicopa lubrica MÜLLER (*var.*).

Recent: Bela on the sea.

Marpessa laminata MONTAGU.

Recent: Bela on the sea; 2. Russe: Danube alluvium.

Vallonia costata MÜLLER.

Recent: 1. Galata.

Holocene: 1. Hadžidere: terrace.

Lucena oblonga DRAPARNAUD var.

1. Tiča dere: Subboreal Litorinian.

Amphibina sp. cf. *Pfeifferi* ROSSMAESSLER.

Holocene: 1. Arab čušma near Varna: Greek culture pit.

Ena obscura MÜLLER.

Recent: Galata: alluvium, 18 shells.

Holocene: Sviš'ov on the Danube: Atlantic Litorinian — travertine.

Orcula doliolum BRUGUIÈRE var. *turcica* aut. f. *elongata* f. n.

Recent: Galata: alluvium, h. = 7 mm., windings +10.

Differt a typo varietatis turciae testa elongata, anfractibus 10: Long 7 mm.

Carychium minimum MÜLLER.

Recent: 1. Galata: shore — alluvium; 2. Peinardžik near Varna.

Limnaea stagnalis LINNÉ.

Holocene: Vid river at Vidin — unhorizend.

Radix auricularia LINNÉ var.

Recent: Tiča? var. juv.

Holocene: Gebedžensko-Lake: Subboreal Litorinian.

Stagnicola palustris MÜLLER var. *corvus* GMELIN.

Holocene: 1. Gebedžensko Lake: Atlantic Litorinian.

Galba truncatula MÜLLER f. *typica*.

Holocene: Deliduška: one of the Devna springs.

Galba truncatula MÜLLER f. *minutissima* f. n.

Holocene: Gebedžensko Lake: Subboreal Litorinian.

Coretus corneus LINNÉ.

Recent: Vid river at Vidin.

Holocene: Topolovica river at Vidin: unhorizoned.

Coretus ammonoceras WESTERLUND.

Holocene: Vidin: Danube (unhorizoned).

Tropidiscus marginatus DRAPARNAUD.

Holocene: 1. Tiča dere: Subboreal Litorinian.

Paraspira leucostoma MÜLLER.

Holocene: 01. Tiča dere: Subboreal Litorinian.

Armiger crista LINNÉ.

Holocene: 1) Gebedžensko Lake: Subboreal Litorinian.

Cyclostoma elegans MÜLLER.

Recent: 1. Konstantin Monastyr; 2. Ses Sevmes; 3. Galata; 4. Kavarna (Dobruja); 5. Bela on the sea.

Holocene: 1. f. *minor* (+12:8); 1. Hadži dere near Nesebr; unhorizoned; 2. Sozopol — fjords: Litorinian s. l.; 3. Kurbej near Devna, travertine, Atlantic Litorinian; 4. Čifte dere: unhorizoned; 5. Kavarna: travertine — Atlantic Litorinian.

Pleistocene: f. *minor*: 1. Galata: in Tertiary eluvium of the Pleistocene.

Vivipara danubialis BOURGUIGNAT var. *Penchinati* BOURGUIGNAT.

Holocene: 1. Russe: bank of the Danube (unhorizoned).

Lithoglyphus naticoides FÉRUSAC.

Holocene: 1. Vidin: Danube (banks): unhorizoned.

Lithoglyphus naticoides FÉRUSAC var. *aperta* KÜSTER.

Recent: 1. Vidin: Danube.

Hydrobia acuta DRAPARNAUD.

Recent: Carska reka (river): 1 km. above its mouth.

Melanopsis acicularis FÉRUSAC.

Holocene: 1. Sviš'ov: travertine — Atlantic Litorinian.

Theodoxus fluviatilis LINNÉ.

Recent: Devna springs: 1. 0Gipsis; 2. 0Bezdan; 3. 0Kurbej; 4. 0Deliduška: var. *nigra* n.; 5. 0spring opposite Gebedže on the southern shore of the Varna Lake.

Var. *nigra* PBK. differt a typo testa minore, colore omnino nigro.

Leuconia Micheli MITTRE.

Recent: Eski-čušme dere near Varna.

Bittium reticulatum DA COSTA.

Holocene: 1. Tiča dere: Subboreal Litorinian.

Pleistocene: 1. 0Nesebr: loess (W.); 2. 0Galata: loess (W.).

Nassa reticulata (L.) LAMARCK.

Recent: 1. Uzun kum.

Phasianella pulla LINNÉ.

Recent: 1. Varna.

0*Mytilus galloprovincialis* LAMARCK.

Holocene: 1. 0Sozopol "fjords": Litorinian s. l.; 2. 0Carevo-grad: fluviomarine terrace.

Unio rostratus RETZIUS.

Holocene: Vidin: bank of the Danube, unhorizoned.

Sphaerium corneum LINNÉ.

Recent: Novoselce near Sofia, Kadijevo, Kazščane.

Sphaerium rivicolum LAMARCK.

Recent: Kadijevo.

Musculinum lacustre MÜLLER.

Recent: Sofia, Devna springs, Varna.

Pisidium amnicum MÜLLER.

Recent: Rybnica river.

Pisidium cinereum ALDER.

Recent: Levaja Isker, Samokov, Sofia, Vitoš-planina.

Pisidium milium HELD.

Recent: Novoselce, Kazičane.

Pisidium obtusolastrum WOODWARD (= *obtusale* AUCH.).

Recent: Kazičane, Levaja Isker, Mala cerkva severni Rika.

Pisidium bulgaricum ODHNER.

Recent: Vitoš-planina.

New Localities:

0) marks my new localities.

- 0) Baba-burun: on the southern shore of the Varna Lake.
- 0) Bezdán: one of the Devna springs.
- 0) Carska reka = Ropotamo.
- 0) Deliduška } two of the Devna springs.
- 0) Gipsis. }
- 0) Kavarna (town in the Dobruja).
- 0) Osom: river of the Danube basin.
- 0) Primorska — Pomorska.
- 0) Sultanalar: lake in the basin of the Provadije river.
- 0) Vardin: village on the Danube.

Soustavný přehled nových forem fauny posttercierních měkkýšů bulharských.

Systematic Survey of the News Forms of the Post-Tertiary Mollusc Fauna of Bulgaria.

Genus (subgenus)	pleistocene	holocene	prohistoricum & historicum	recent	speciel (& formes)
<i>Zonitoides</i>		•			<i>Hammonis Strömer</i>
<i>Helicopsis</i>				•	<i>variabilis</i> DRAPARNAUD f. <i>minor</i> f. n.
<i>Helicella</i>				•	<i>obria</i> HARTMANN ab. <i>pallescens</i> ab. n.
<i>Euomphalia</i>	•			•	<i>strigella</i> DRAPARNAUD var. <i>excentrica</i> var. n.
<i>Theba</i>				•	<i>frequens</i> MOUSSON f. <i>minor</i> f. n.
<i>Cattania</i>				•	subf. <i>conoidea</i> subf. n.
<i>Helicopsis</i>				•	<i>Pellii</i> HESSE f. <i>minor</i> f. n.
				•	<i>spiruloides</i> WAGNER f. <i>depressa</i> f. n.
				•	subf. <i>conoidea</i> subf. n.
				•	f. <i>minor</i> f. n.
				•	ab. <i>fasciata</i> ab. n.
				•	ab. <i>pallescens</i> ab. n.
				•	ab. <i>efasciata</i> ab. n.
<i>Tachea</i>				•	<i>austriaca</i> MÜHLFELDT f. <i>major</i> f. n.
<i>Vallonia</i>		•			(f. <i>jantraensis</i>) f. n.
<i>Orcula</i>		•			<i>tenuilabris</i> A-BRAUN
<i>Chondrula</i>				•	<i>doliolum</i> BRUGUIÉRE var. <i>turcica</i> AUT. f. <i>elongata</i> f. n.
				•	<i>Clessini</i> RETOWSKY *) f. <i>6. dentata</i> f. n.
				•	f. <i>7. „ =? f. typica</i>
				•	f. <i>8. „ f. n.</i>
				•	f. <i>minor</i> f. n.
				•	f. <i>curta</i> f. n.
				•	ab. <i>pallescens</i> ab. n.
<i>Zebrina</i>	•				<i>varnensis</i> FRIVALDSKÝ f. <i>minor</i> f. n.
<i>Chondrula</i>				•	<i>carneola</i> ZIEGLER (MOUSSON) var. <i>robusta</i> var. n.
				•	„ „ var. <i>robusta</i> v. u. f. <i>bituberculata</i> f. u.
				•	„ „ f. <i>elongata</i> f. n.
				•	„ „ var. <i>Gočevi</i> var. n.
				•	„ „ ab. <i>pallescens</i> ab. n.
				•	<i>microtragus</i> PARREYSS (ROSSM.) f. <i>major</i> f. n.
				•	„ „ ab. <i>pallescens</i> ab. n.
<i>Galba</i>				•	<i>truncatulla</i> MÜLLER f. <i>minutissima</i> f. n.
<i>Lucena</i>	•				<i>Christo Botjovi</i> sp. n.
				•	„ „ var. <i>elongata</i> var. n.
<i>Theodoxus</i>				•	<i>fluviatilis</i> LINNÉ ab. <i>nigra</i> ab. n.
<i>Leuconia</i>				•	<i>Micheli</i> MITTRE
<i>Cerithium</i>	•				<i>vulgatum</i> BRUGUIÉRE
<i>Nassa</i>	•				<i>reticulata</i> LINNÉ
„	•				sp.
<i>Rissoa</i>	•				sp.
<i>Mytilus</i>	•				<i>galloprovincialis</i> LAMARCK
<i>Cardium</i>	•				<i>edule</i> LINNÉ
<i>Venus</i>	•				<i>gallina</i> LAMARCK
<i>Limax</i> 92).				•	<i>macedonicus leucopus</i> P. HESSE
<i>Agriolimax</i> 92).				•	<i>Ahersitas</i> (HEYN. & KOCH) SIMROTH
<i>Milax</i> 92).				•	<i>Kuščeri</i> H. WAGNER

*) non Retzius!!!

LITERATURA.

- Doplňky k seznamu vlastní práce: Posttertiaria nonmarina mollusca bulgarica („Věstník královské České společnosti nauk“, Praha 1941).
- 1.(82.) BÜTTNER: Beiträge zur Kenntniss der Molluskenfauna Bulgariens („Ver. f. Naturkunde in Zwickau i. Sa. 1928).
 - 2.(83.) ODHNER N. H.: Sphaerien u. Pisidien aus Bulgarien („Archiv f. Molluskenkunde“, Frankfurt a. M. 1929).
 - 3.(84.) PETRBOK JAR.: První otevřená stanice paleolitická v Bulharsku u Beleva nad jezerem („Sborník III. sjezdu československých geografů v Plzni 1935“, Praha 1936).
 - 4.(85.) PETRBOK JAR. a SKUTIL JOS.: Beleva-Gebedže, ein neuer paläolithischer Fundplatz in Bulgarien (Quatär“, Berlin 1941).
 - 5.(86.) PETRBOK JAR.: Mohou existovati hlinité přesypy (duny)? („Příroda“, Brno 1941.)
 - 6.(87.) — Moje bulharská bilance (ibid.).
 - 7.(88.) — Punctum pygmaeum Draparnaud novým měkkýšem bulharského holocénu (ibid. 1942—1943).
 - 8.(89.) — Paleolitická čepel z Konstantin-monastyru v Bulharsku (ibid.).
 - 9.(90.) — Nový měkkýš bulharského pliocenu: Vallonia tenuilabris A. Braun (ibid. 1943/4).
 - 10.(91.) — Melanopsis acicularis Ferrusac v travertinovém profilu u Svištova (ibid.).
 - 11.(92.) WAGNER HANS: Neue Beiträge zur Kenntnis der Nachtschneckenfauna der Balkanhalbinsel mit besonderer Berücksichtigung der griechischen Orten („Annales historico-naturales Musei Nationalis Hungarici“, vol. XXXIII. 1940, Budapest).
 - 12.(93.) PETRBOK JAR.: Mekotelite na Varnenskovo i Gebendženskevo ezera. (Sofia 1948.)

VYSVĚTLIVKY K TABULKÁM:
EXPLANATION OF THE PLATES:

- I. 1. Řeka Topolovica: oba břehy holocenním nánosem.
Topolovica-river: the two banks in Holocene alluvium.
2. Řeka Osom: holocenní pravý břeh nárazový.
Osom-river: the right bank in Holocene alluvium.
- II. 1. Dunaj u Russe: holocenní břeh.
Danube at Russe: the holocene bank.
2. „Pobity kameny“ (Dekilitaš) u Varny: erodivní plocha s conchyliemi a odkrytým sídlištěm aurignackým.
„Pobity kameny“ (Dekilitaš) near Varna: the eroded plane with shells and uncovered aurignac-paleolithic station.

SBORNÍK NÁRODNÍHO MUSEA V PRAZE - ACTA MUSEI NATIONALIS PRAGAE

IV. (1948) - B (PŘÍRODOVĚDNÝ - HIST. NATURALIS) No. 3.

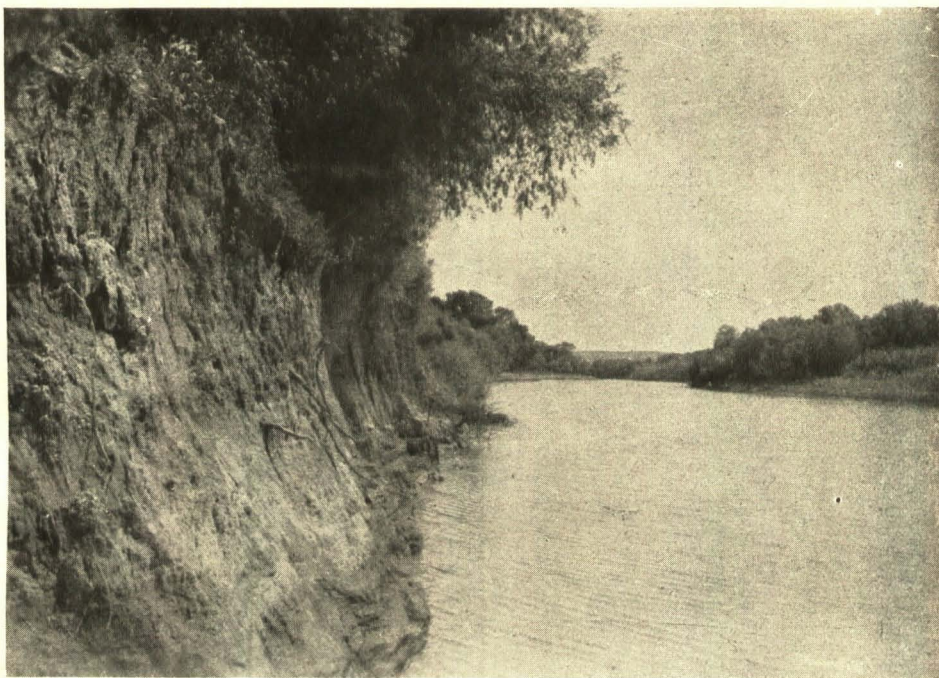
REDAKTOR IVAN KLÁŠTERSKÝ

JAROSLAV PETRBOK: PŘÍSPĚVEK K POZNÁNÍ POSTTERCIERNÍCH MĚKKÝŠŮ
BULHARSKA. — A CONTRIBUTION TO THE KNOWLEDGE OF THE POST-
TERTIARY MOLLUSCS OF BULGARIA.

V LISTOPADU 1948 VYDALO SVÝM NÁKLADEM V POČTU 1000 VÝTISKŮ NÁRODNÍ MUSEUM
V PRAZE - VYTISKLA STÁTNÍ TISKÁRNA V PRAZE III. CENA BROŽOV. VÝTISKU 50.- Kčs



1



2



1



2