

**ACTA MVSEI APVLENSIS**

**APULUM LI**

series *ARCHAEOLOGICA ET ANTHROPOLOGICA*

***CARPATHIAN HEARTLANDS***

*Studies on the prehistory and history of Transsylvania in  
European contexts, dedicated to Horia Ciugudean on his 60<sup>th</sup>  
birthday*

***NUCLEUL CARPATIC***

*Studii privind preistoria și istoria Transilvaniei în context  
european, dedicate lui Horia Ciugudean la aniversarea a 60 de  
ani*

**Edited by /  
Volum îngrijit de:**

**Nikolaus Boroffka  
Gabriel Tiberiu Rustoiu  
Radu Ota**



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series *ARCHAEOLOGICA ET ANTHROPOLOGICA*



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**Horia Ciugudean**



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## THE EVALUATION AND SPATIAL DISTRIBUTION OF BRONZE DEPOSITS IN BUCOVINA

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**Abstract.** The purpose of this paper is to evaluate and analyze the spatial distribution of the bronze deposits in din Bucovina, dated to the Early Hallstatt, represented in the area by the Gáva-Holihrad culture. To sustain our study, we applied an original algorithm, able to identify the essential elements that can indicate certain models of behavior regarding the geographic space in which the bronze deposits were laid. The geographic analysis elements applied for Bucovina province indicate the preference of the communities of the Gáva-Holihrad culture for the deposits in the riverbeds, at confluences, on low and average terraces, as well as on very high hill, with maximal general visibility.

**Key words:** Bucovina, bronze deposits, Gáva-Holihrad, spatial analysis.

**Cuvinte cheie:** Bucovina, depozite de bronzuri, Gáva-Holihrad, analiză spațială.

The bronzes discoveries on the territory of Romania and the adjacent areas are well known, being the subject of numerous papers and specialized monographic studies undertaken by researchers<sup>1</sup>. Still, the northeast part of Romania, more precisely the territory of the former historical province of Bucovina<sup>2</sup>, in terms of bronze study, is insufficiently researched and valorized<sup>3</sup>. That is why, we propose to discuss a customized model of analysis of the bronze deposits resulting from the Gáva-Holihrad culture (Early Hallstatt), represented

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<sup>1</sup> Vulpe 1970; Petrescu-Dîmbovița 1977; Ignat 1981, p. 133-146; Kobal' 2000; Mozsolics 1985; Ignat 1993, p. 375-378; Mozsolics 2000; Ignat 2000; Dergačev 2002.

<sup>2</sup> The northern part of Moldavia, which during the period 1775-1918 was annexed to the Habsburg Empire, later the Austro-Hungarian Empire. At present, Bucovina is split on the territory of two States: Ukraine and Romania.

<sup>3</sup> Szombathy 1899, p. 49-56; Ignat 1981; Ignat 1993; Ignat 2000; Andronic 2008, p. 122-175.

in this region by the Grănicești cultural group<sup>4</sup>. Our model is original for Bucovina, and the repertory of the bronze deposits is the first one achieved so far for this historical-geographic space. The first bronze deposits of Bucovina were found in the 19<sup>th</sup> century and at the beginning of the 20<sup>th</sup> century, while most discoveries have been recorded during the last 50 years.

**Working method.** The case study includes eight bronze deposits. We focused on the former historical province of Bucovina (ca. 10.000 sq km), which provides land variability, from the geomorphologic point of view as well as from the one of the hydrographic network crossing it. Our field research took place in 2011 on the territory of Ukraine<sup>5</sup> and Romania (Suceava County) and were meant to identify the locations of bronze deposits mentioned in the specialized literature, to repertory them, map and record the location data by means of a GPS. Mention should be made of the fact that we did not include in the present paper either those deposits whose discovery location could not be identified in the field or those which were uncertain in terms of composition and cultural-chronological assignment<sup>6</sup>. To help interpreting the data, we used various Austrian maps dated to the 19<sup>th</sup> and the beginning of the 20<sup>th</sup> century and at the same time topographic maps at the scales of 1:25.000, 1:5.000 (black and white 1982 edition) were studied; for delimiting and classifying the basins and the hydrographic network, we also used the topographic maps of Suceava County (1:50.000, 1:100.000), published by the Military Topographic Direction – Bucharest, as well as orthophotoplans<sup>7</sup>, satellite images and SRTM representations from U.S. Geological Survey and Global Land Cover Facility. For Ukraine, we used the Map of Chernivtsi Region (1:250.000), Austrian maps of 1910 (redesigned in the Stereo 70 projection)<sup>8</sup> and satellite images taken from Google Maps. The field determinations were undertaken with the help of the Garmin eTrex Vista CX GPS device. Observations were also made regarding the forms of relief, the relations between the locations where the bronze deposits were discovered and the morphology of the region. Regarding the watercourses in the vicinity of these deposits, we chose the Horton-Strahler classification<sup>9</sup>.

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<sup>4</sup> László 1983-1984, p. 65-84; László 1994.

<sup>5</sup> We would like to express our gratitude to prof. S. Pivovarov PhD, M. Ilkiv PhD Student (Jurij Fedkovic University in Chernivtsi) and N. Bodnariuc PhD student (Oprișeni) for the support granted during our field researches in Ukraine.

<sup>6</sup> For instance, we had to give up the deposit of Solca, which could not be identified in the field. Discovered in 1848, in the bank of a little brook, the deposit contained one celt and a hooked sickle type (Soroceanu 1995, p. 73).

<sup>7</sup> <http://www.ancpi.ro>.

<sup>8</sup> <http://earth.unibuc.ro>.

<sup>9</sup> For the description of this method see: Romanescu 1996.

**Proposed algorithm**<sup>10</sup>. To extract, synthesize and analyze as many pieces of information as possible on a bronze discovery, we chose the following presentation algorithm; each sheet achieved this way is accompanied by a localization sketch on the aerial and satellite image, to which corresponds the number in the repertory below.

**1.** locality; toponym, administrative assignment; **2.** short description of the discovery; single piece deposit or collective deposit; number of pieces, other elements of interest; dating; **3.** a) GPS-determined geographic coordinates; b) description of the location of the discovery, relevant reference points; **4.** a) absolute altitude; b) relative altitude; c) exposure; d) relief subunit it is part of; e) hydrographic basin it belongs to; f) hierarchic degree of the nearest watercourse, according to the Horton-Strahler classification; g) visibility. e.g.: maximal – hill top; **5.** discovery conditions: a) if the deposit is collective or a single piece deposit; b) the environment in which it was discovered: aquatic environment – riverbed, hill top, hill slope, lower or upper terrace, confluence zone; c) related elements: bronze vessel, ash, stone box, stone construction, pit, well etc.; **6.** bibliography.

#### ***Repertory and application of the algorithm.***

**1. 1. Bordei (Burdej), Cosmin Hill, Chernivtsi region, Ukraine; 2.** in 1903 a bronze deposit was found laid in a pit, consisting of eight C-shaped bracelets and two celts; Gáva-Holihrad, Ha A-B; **3.** a) N48° 19.841' E25° 46.475'; b) on top of *Cosmin Hill*, to the right of River Prut, at ca. 12 km WNW of the city of Chernivtsi; **4.** a) the absolute altitude is of 302 m; b) the relative altitude to the minor riverbed of the Prut is of ca. 130 m; c) total exposure; d) *Suceava Plateau*; e) basin of River Prut; f) rank of the watercourse: VII; g) maximal visibility, dominant position; **5.** a) collective deposit of at least 10 pieces; b) hill top; c) potsherds; **6.** Romstorfer 1904, p. 40-43, fig. 9-12; Niculică 2010, p. 327-332; Niculică 2013, p. 195, no. 6.

**2. 1. Corovia (Korovija), Chernivtsi region, Ukraine; 2.** in 2007 a hoard of 35 pieces was found: axe with disc-butt with central spur, two discs, three celts and fragments hereof, four sickles, one knife, bracelets, fragments of bronze cups, different ingots and fragments of a bronze vessel; Gáva-Holihrad, Ha A-B; **3.** a) N48° 14.510' E25° 56.280'; b) between villages Hodilău and Corovia, at less than one 1km from the southern limit of the city of Chernivtsi; **4.** a) the absolute altitude is of 229 m; b) the relative altitude ca. 15 m to the thalweg of Iabloniveț brook; c) land exposure to north and northeast; d) *Suceava Plateau*; e)

<sup>10</sup> We were inspired by the method of M. Văleanu, applied for the first time in Romania for the prehistoric settlements of Moldavia (Văleanu 2003).

hydrographic basin it belongs to: Corovia (affluent of the Prut); f) rank of the watercourse: III; g) maximal visibility – from the hill top; **5.** a) collective deposit of 35 items; b) glacis terrace on the right side of the brook delimiting village Hodilău from the city of Chernivtsi, affluent of brook Corovia, ca. 5 km from the confluence; c) -; **6.** Il'kiv 2008, p. 26-35; Niculică 2013, p. 195, no. 10.

**3. 1. Costâna, Suceava County, Romania; 2.** sword of the *Vollgriffschwert* type, discovered in December 2010, in the minor riverbed of the Suceava, at 1-2 m from the bank, at the depth of 0.50 m; secondary position; Gáva-Holihradý, Ha B; **3.** a) N47° 42.043' E26° 08.147'; b) 11 km NW of the city of Suceava; **4.** a) absolute altitude 289 m; b) relative altitude 0 m; c) horizontal land; d) *Suceava Plateau*; e) basin of River Suceava; f) rank of the watercourse: VII; g) great visibility in the Sucevei meadow and towards the surrounding hills; **5.** a) deposition of a single piece (?); b) aquatic environment, in the riverbed of the Suceava, near the confluence of Ilișești brook with River Suceava, at ca. 1 km up this confluence point; c) -; **6.** Niculică 2012, p. 237-253; Niculică 2013, p. 195, no. 7.

**4. 1. Kițmani (Kicman'), Chernivtsi region, Ukraine; 2.** deposit discovered in 2007, consisting of 14 items: four celts, a sickle fragment, a knife, a bar and seven bracelets; Gáva-Holihradý, Ha A; **3.** a) N48° 26.562' E25° 45.947'; b) in the built area of the town of Kițmani; **4.** a) absolute altitude 222 m; b) relative altitude 30 m to the thalweg of Sovița brook; c) exposure to the east; d) *Dniester Hills*; e) hydrographic basin of the Prut; f) rank of the watercourse: IV; g) great visibility on the north-south axis; **5.** a) collective deposit of 14 pieces; b) 30-40m terrace on the right side of the valley of Sovița brook; c)-; **6.** Pivovarov, Il'kiv 2007, p. 7-15; Niculică 2013, p. 195, no. 9.

**5. 1. Măneuți, Suceava County, Romania; 2.** tang-hilted bronze sword, of the Reutlingen type, Ighiu variant<sup>11</sup> discovered in 1995, in the minor riverbed of River Suceava, in a small stone box; the sword was obliquely thrust, for more than its half, into the gravel riverbed; Gáva-Holihradý, Ha A; **3.** a) N47° 53.470' E25° 58.207'; b) 2 km N of Măneuți village, and 8km NNE of the town of Rădăuți; **4.** a) absolute altitude 353 m; b) relative altitude 0 m; c) horizontal land; d) *Suceava Plateau*; e) basin of River Suceava; f) rank of the watercourse: VII; g) great visibility all around; **5.** a) deposit of a single piece; b) aquatic environment, in the riverbed of the Suceava; at ca. 300 m N of the confluence of Pozen brook with River Suceava; c) stone box; **6.** Batariuc 2003, p. 167-172; Niculică 2013, p. 195, no. 11.

**6. 1. Șcheia (probably Siliște zone)<sup>12</sup>, Suceava County, Romania; 2.** at the beginning of the 20<sup>th</sup> century, on the property of the family Aritonovici near

<sup>11</sup> Classification by Bader 1991, p. 88-89 and pl. 18/154-161; 19/162-166.

<sup>12</sup> Our recent research in the National Archives of Suceava indicates as place of discovery the Șcheia – Siliște zone; according to Austrian maps and land property documents, it was the Aritonovici family that had properties in the area.

Suceava, there was discovered a deposit composed of 19 pieces: whole and fragmentary bracelets, decorated, a winged axe, a celt chisel, a chariot axle sleeve, etc.; Gáva-Holihrad, Ha A; **3.** a) N47° 38.960' E26° 14.187'; b) the area is at the western end of the city of Suceava, at the western feet of *Zamca Hill*, on the left bank of Șcheia brook, right-side affluent of the Suceava; **4.** a) absolute altitude 302 m; b) relative altitude 8m to Șcheia brook; c) quasi-horizontal land; d) *Suceava Plateau*; e) basin of River Suceava; f) rank of the watercourse: III; g) low visibility to the east and south, great visibility to the west and north; **5.** a) collective deposit, 19 pieces; b) lower terrace on the left side of Șcheia brook; the confluence of Șcheia brook to the Suceava is at ca. 2 km ; c) -; **6.** Hănsel 2005, p. 285-299; Niculică 2013, p. 196, no 16.

**7. 1. Todirești, Suceava County, Romania; 2.** in 1956, during the construction of the railway station in the above locality there were found 12 hooked sickles, six of large size, six other being smaller; they were all decorated with longitudinal nervures; Gáva-Holihrad, Ha A; **3.** a) N47° 41.563' E26° 02.581'; b) on the territory of Todirești village, on the left bank of River Soloneț, on the present place of the railway station; **4.** a) absolute altitude 332 m; b) relative altitude 8 m to the thalweg of Soloneț; c) southward exposure; d) *Suceava Plateau*; e) basin of River Soloneț, right affluent of the Suceava; f) rank of the watercourse: V; g) good visibility on the couloir of the valley; **5.** a) collective deposit of 12 pieces; b) left terrace of Soloneț; c) -; **6.** Ignat 1981, p. 142 and fig. 7/4-5; László 1994, p. 147; Andronic 1997, p. 37, no. 21 C; Ignat 2000, p. 68, no. 34; Andronic 2008, p. 147; Niculică 2013, p. 196, no. 18.

**8. 1. Voloca (Voloka), Turci, Chernivtsi region, Ukraine; 2.** deposit discovered in 1987, at a depth of 2 m, composed of seven celts placed in a bronze cauldron; Gáva-Holihrad, Ha B-C; **3.** a) N48° 11.969 E25° 56.582; b) la 60 m E de localitatea Voloca; **4.** a) absolute altitude 190 m; b) relative altitude 4m to the village brook; c) quasi-horizontal land; d) *Suceava Plateau*; e) hydrographic basin of River Prut; f) rank of the watercourse: III; g) great visibility to the east and northeast; **5.** a) collective deposit of seven celts, in bronze cauldron; b) meadow terrace, at ca. 570 m of the confluence; c) bronze vessel; 2 m depth; **6.** Vojnarovskij, Smirnova 1993, p. 183-190; Niculică 2013, p. 196, no. 19.

**Preliminary conclusions.** The resulting observations are pertinent for the spatial distribution of the bronze deposit in Bucovina. Generally, on the background of a plateau relief, the chosen locations were the meadow terraces or the dominant places. First of all, the places located near waters or even in the riverbeds (lower terraces), in many cases near confluence points or hills with considerable absolute and relative altitude were preferred. The swords, representing single item-deposits, were laid in the lower terraces of the riverbeds, while collective deposits are spread on high zones: middle and high terraces, hill tops. Geomorphologically speaking, the low laying locations are the

meadow terraces or the lower terraces of certain rivers (Suceava River, for example), while the high locations correspond to structural plateaus. Taking into account that the rivers developed laterally throughout time, it is not excluded that the bronze swords of Costâna and Măneuți were initially buried in the neighborhood of the river Suceava, in the lower terraces, while in time (3000 years) these bronze items were certainly brought to light by the lateral erosion of the river.

This preliminary analysis of the bronze items discovered in Bucovina brings into discussion certain questions such as: which is the internal chronology and cultural structure of the Grănicești cultural group and how widely spread was it, spatially speaking? Which is the connection between the bronze deposits and the existence of Gáva-Holíhrady fortified settlements, such as those of: Siret – *Dealul Ruina* (Suceava County, Romania), Suceveni, Vârvata – *Cetățuie* and Voloca (Chernivtsi region, Ukraine)<sup>13</sup>. In the future, we shall have to take into consideration, for completing our algorithm, other elements of the Gáva-Holíhrady type: the open settlements, plane / barrow cemeteries and salt springs discovered near the bronze finds / hoards. The study and understanding of all these aspects may lead to the reconstruction of aspects pertaining to the compliance with certain rules as for the laying down of bronze items by the population inhabiting the space northeast of the Carpathians, during the Hallstatt period.

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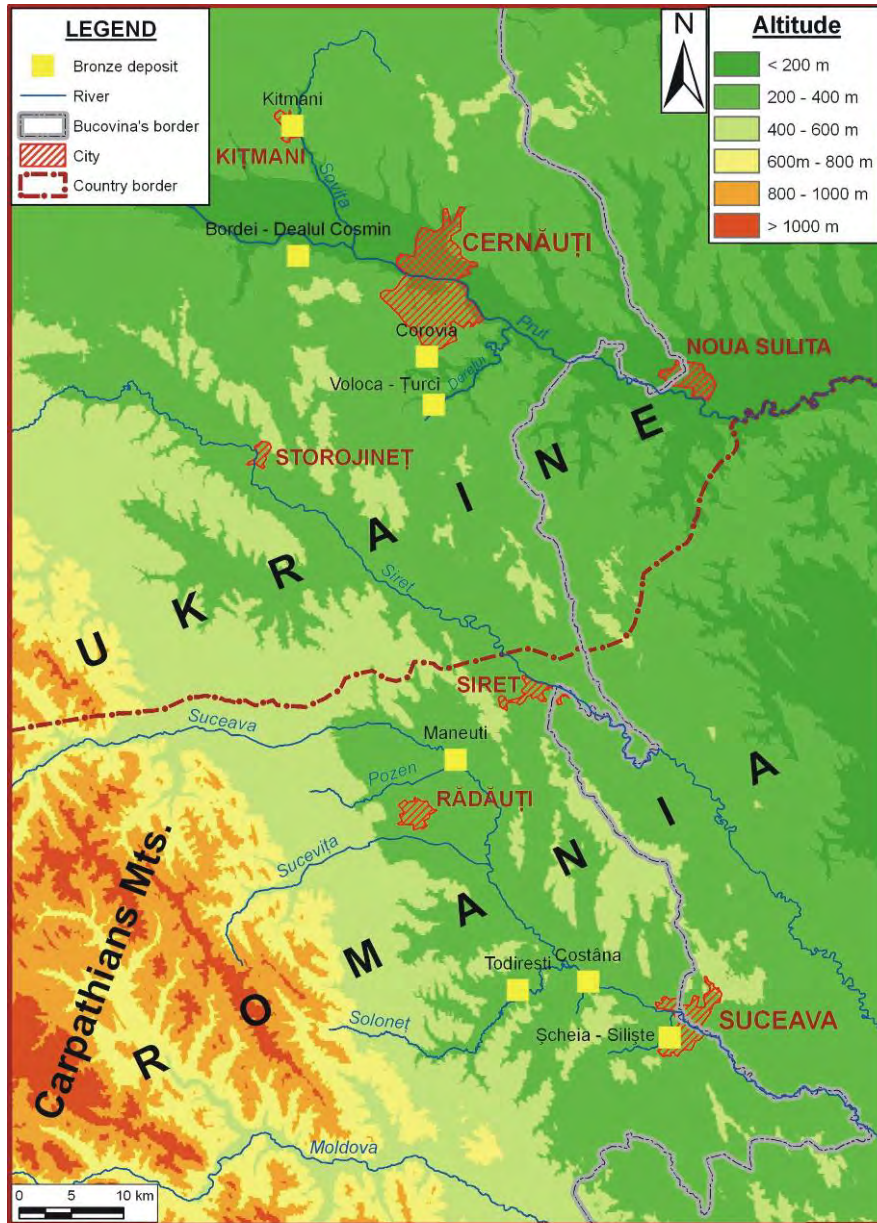
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<sup>13</sup> Unpublished surface researches B. P. Niculică, V. Budui, N. Bodnariuc, M. Ilkiv, 2011. For the Hallstatt fortified sites of the space northeast of the Carpathians, see also Ursulescu, Popovici 1997, p. 51-65.

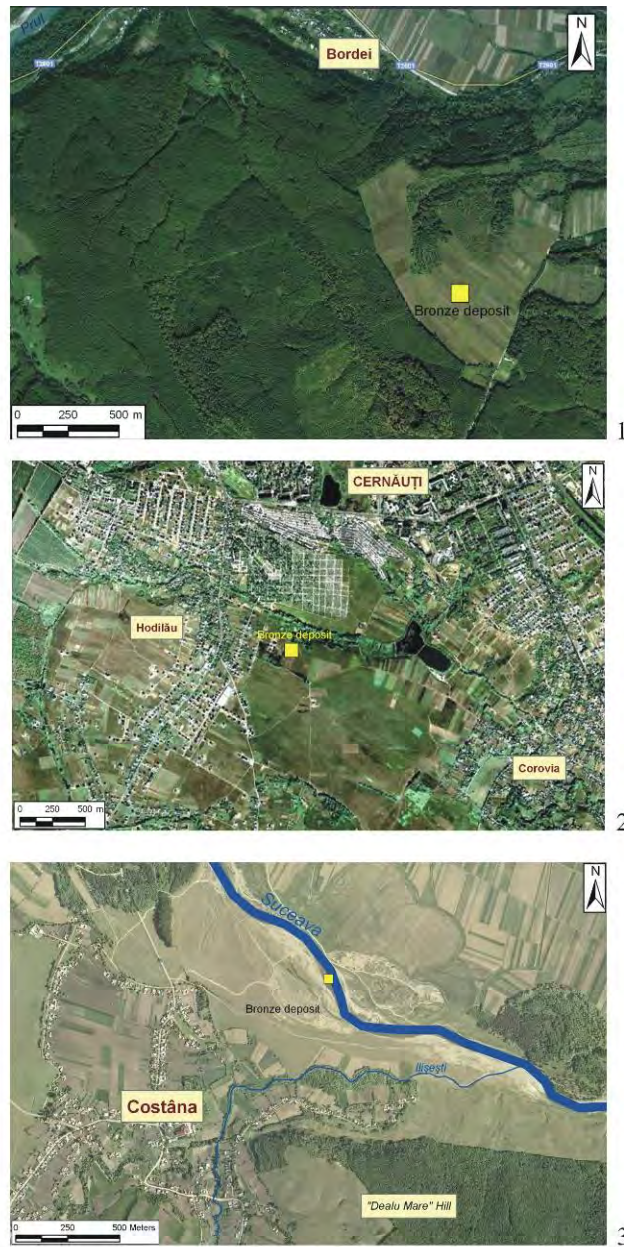
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Pl.1.: Bronze deposits in Bucovina. Map of the discoveries.



Pl. 2.: Location of the bronze deposits in Bucovina. 1, the deposit of Bordei; 2, the deposit of Corovia; 3, the deposit of Costâna.



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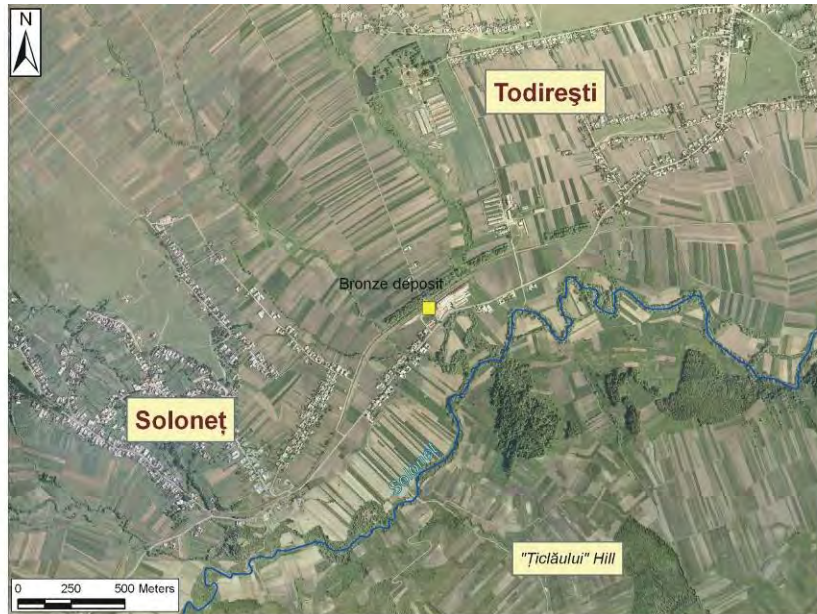


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Pl. 3.: Location of the bronze deposits in Bucovina. 4, the deposit of Kitmani; 5, the deposit of Măneuți; 6, the deposit of Șcheia.



7



8

Pl. 4.: Location of the bronze deposits in Bucovina. 7, the deposit of Todirești  
8, the deposit of Voloca.



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