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Geomagnetic surveys of the Neolithic and the Copper Age sites from the Republic of Moldova (1968-2016): main results, current state and future perspectives

Abstract

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The article presents an overview of the use of geomagnetic method in the prehistoric studies in the Republic of Moldova. Information on 34 surveys has been compiled in order to reveal both the scientific results of geophysical prospection and the perspectives for future work. As a result, the doubtless importance of geophysics for settlement studies is underlined, providing striking insights into settlement layouts from the early Neolithic to the Copper Age.

Keywords: geophysics, Moldova, Neolithic, Copper Age, settlement layout

▪ Introduction

Non-intrusive research represents one of methodological milestones of contemporary archaeology. Among these, geophysics is of great importance. In contrast to resource and time consuming archaeological excavations, geomagnetic surveys offer the possibility to obtain much faster the exact and complete information about size, layout and internal division of archaeological sites. Combined with field research, these insights offer valuable data for demographical, social and economic estimations as well as for research of strategies of settling and land-use in prehistory.

One of the most basic characteristics of the Southeast European Neolithic and the Copper Age archaeological sites is the massive presence of burnt daub from house remains. Given its higher magnetic amplitude, this burnt clay is extremely well visible on geophysics, providing striking and well-contoured feature limits. That is why, following aerial photography, geomagnetic method started to be extensively used in research of complex rich-in-daub Tripolye sites from Ukraine and Republic of Moldova in Soviet times, providing first detailed settlement plans obtained without extensive archaeological digs (for a history of research see Bicbaiev 2007; Videiko 2012; 2013). Many of the anomalies from these plans were subsequently excavated, proving the exactness of geophysical plots. In the late 2000's, a new stage in Cucuteni-Tripolye geomagnetic research begun as a result of scientific cooperation with specialists from Western Europe (cf. Mischka 2008; 2009; Chapman *et al.* 2014; Rassmann *et al.* 2016). New high-resolution magnetometers offer the possibility to explore prehistoric sites to an even greater extent, bringing to light anomalies of lower size and / or amplitude such as ditches, pits, causeways or kilns (Rassmann *et al.* 2014). Another result of this new research period is the extension of geomagnetic surveys over sites from other Neolithic and Copper Age cultures (Criș, Linear Pottery Culture, Gumelnița) with some interesting and noteworthy results.

In the following article I would like to give an overview of geophysical surveys of the Republic's of Moldova prehistory. Most of them refer to Cucuteni-Tripolye sites; however, some plots for other cultural entities are also available. The main scope of the article is not only to present an account of the surveys but also to underline

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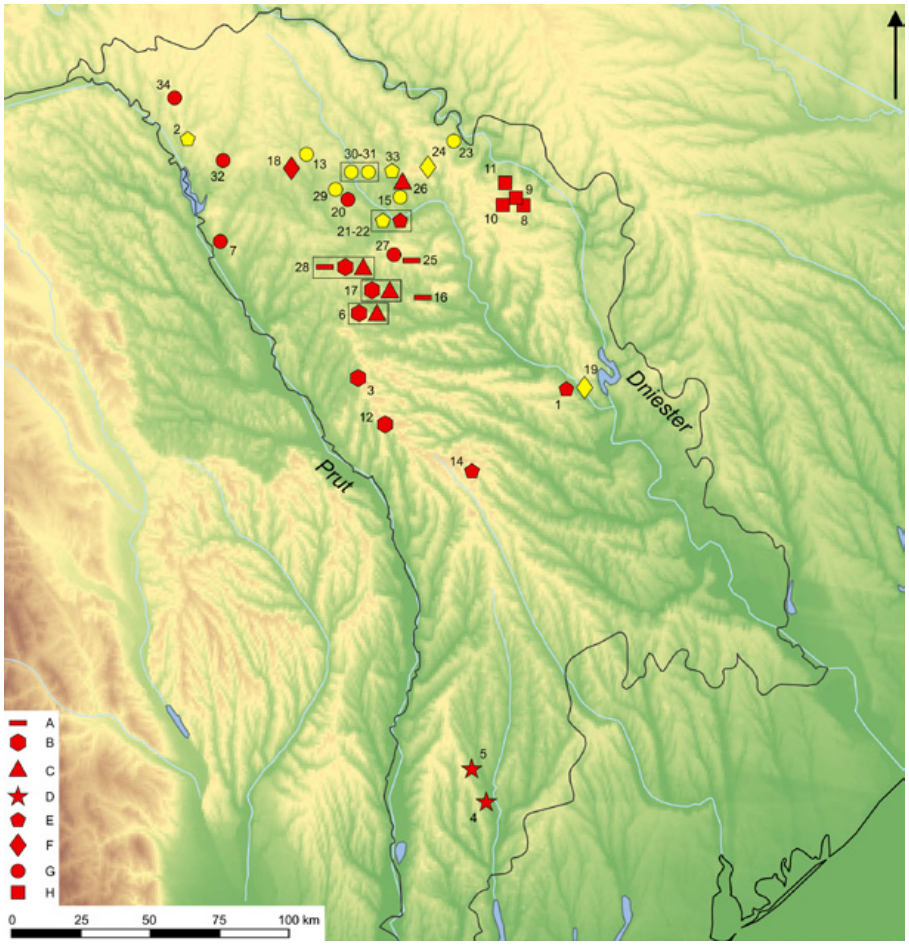

Fig. 1. Map of the Neolithic and Copper Age settlements prospected geophysically on the territory of the Republic of Moldova. Yellow symbols mark older surveys; red symbols – the modern ones. Numbering of sites corresponds to table 1. Symbols: A – Starčevo-Criș culture; B – Linear Pottery culture; C – Precucuteni – Tripolye A; D – Bolgrad-Aldeni (Gumelnița); E – Cucuteni A – Tripolye B1; F – Cucuteni A-B – Tripolye B1-B2; G – Cucuteni B – Tripolye B2, C1; E – Tripolye C2 sites

less researched cultural groups and chronological units as well as contour some perspectives for future work.

▪ General data about the surveys

There are 34 geomagnetic plans obtained for the Republic of Moldova in 1968-2016, made on 33 sites (the Cucuteni A – Tripolye B1 settlement from Putinești III was scanned twice, first by Dudkin in 1989 and then by Hofmann and Țerna in 2016 with a high-resolution magnetometer; see below). They are distributed unevenly both in spatial-chronological terms and in regard to type and quality of the survey. General data on the geophysics can be summarized in Table 1.

The spatial distribution of scanned sited is uneven (Fig. 1). As we can see from the map, most of the older surveys focused on the middle Răut basin. In recent years, sites from other regions were prospected, including the Prut area, the middle Dniester and Central Moldova. First geomagnetic surveys were also conducted in the south of the country, on two Bolgrad-Aldeni (Gumelnița) sites. In the future, one should concentrate more on settlements from the Prut and the Nistru riverbanks as well as on sites located on their tributaries. Also the far northern part of the country (densely populated in the Copper Age) lacks geophysical surveys. In general terms it should be concluded that the spatial "coverage" of Moldova's territory with geomagnetic prospections is far from sufficient.

If we take a look at the distribution of older and more recent research in regard to various Neolithic and Copper Age cultural units, the overall picture becomes even more non-homogenous (Fig. 2). By far the best researched geomagnetically is the Cucuteni B – Tripolye B2, C1 stage with 6 older and 5 more recent surveys. This fact was determined to a large extent by the constant interest of the specialists in the settlements corresponding to large and huge "mega-sites" from the territory of Ukraine. Thanks to the recent fieldwork from 2014-2016, there are several detailed plans for the Linear Pottery culture and the Tripolye C2 sites. The most underrepresented in terms of geophysical research remain the Starčevo-Criș, Precucuteni – Tripolye A, Cucuteni A-B – Tripolye B1-B2 and Bolgrad-Aldeni settlements.

Most of the surveys did not cover the entire area of the settlements (Fig. 3). This refers to older prospections which were much more time-consuming, but also to some ongoing projects. The use of the 5 or 8-channel systems combined with a GPS (Fig. 6) enhances the speed of work a lot, so there is a great chance that in the nearest future more and more surveys will provide com-

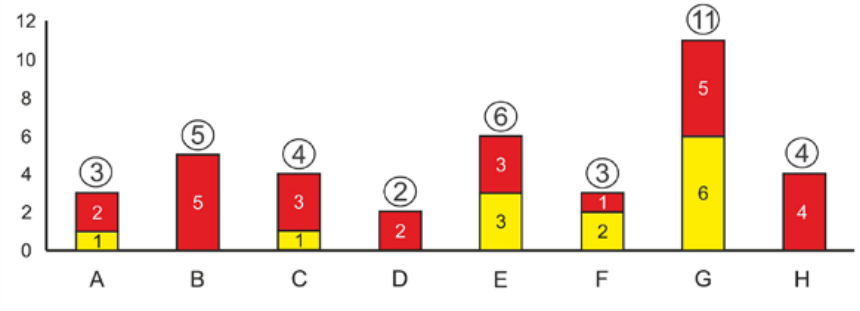

Fig. 2. Histogram with the number of prospections for different Neolithic and Copper Age cultural units. Yellow symbols mark older surveys; red symbols – the modern ones. The total number of prospections is encircled. Letters: A – Starčevo-Criș culture; B – Linear Pottery culture; C – Precucuteni – Tripolye A; D – Bolgrad-Aldeni (Gumelnița); E – Cucuteni A – Tripolye B1; F – Cucuteni A-B – Tripolye B1-B2; G – Cucuteni B – Tripolye B2, C1; E – Tripolye C2 sites

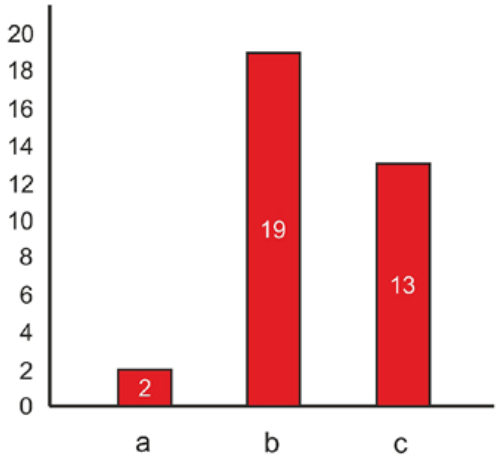

Fig. 3. Histogram showing types of geomagnetic surveys: a – local survey to determine feature contours; b – settlement area partly prospected; c – settlement area fully prospected

Fig. 4. M-27 magnetometer often used for prospection of the Tripolye sites. Here – on display in the Legedzine Museum of Trypillia culture, Ukraine (Photo by S. Țerna)

plete settlement layouts. Anyway, there is an undisputed increase of the workflow's speed from Soviet fixed magnetometers (Fig. 4) to the modern mobile ones (Fig. 5).

▪ Presentation of geophysical plans

Starčevo-Criș culture (circa 5800-5200 BC)

Geomagnetic prospections were performed on three sites, all of them partially scanned. One prospection was made in 1980 by Dudkin, another one in 2014 by Posselt and Țerna and the last one in 2016 by Hofmann and Țerna. All three prospections didn't yield satisfactory results.

1. *Sacarovca I* (Sîngerei district). The prospection was made using a M-23 proton magnetometer on a 1×1 m grid and allowed to identify over 30 secure and several weaker anomalies from dugout features (Dudkin 1980, 32-33). Later, the site was completely excavated and recently published by Dergaciov and Larina (2015). The configuration of excavated features did not correspond to Dudkin's plan; moreover, a repeated geophysical prospection on the site, made by Dudkin in 1991, yielded several other anomalies which also were not confirmed by excavations (Dergaciov and Larina 2015, 24).
2. *Sîngerei XIX* (Sîngerei district). The prospection was made using a 4-channel Förster device and covered circa 3 ha (Țerna, Saile *et al.* in press). Several anomalies from dugout features were identified (Fig. 19); unfortunately, since the site is a multilayered one, there was no possibility to attribute these anomalies to a certain chronological horizon. It seems that most of the anomalies belong to the Precucuteni occupation level (see below).
3. *Mihailovca VII* (Sîngerei district). The prospection (unpublished prospections by Hofmann and Țerna, spring 2016) on a one-layered Criș settlement (about the site see Larina *et al.* 1997, 81-82; Wechler *et al.* 1998, 155) was made using an 8-channel Sensys device

No	Site	Year of survey	Culture / Chronological stage	Type of survey	Excavations	Literature
1	Brănești	2014	E	b	trial	Meyer et al. 2016
2	Brînzeni-Ostrov	1970-80's	E	c	trial	Dudkin, Videiko 2009
3	Bumbăta III	2015	B	b	trial	Țerna, Saile et al. 2016
4	Cealîc	2011-2012	D	c	yes	unpublished
5	Chioselia Mare	2012	D	c	no	unpublished
6	Chișcăreni XIV	2014	B, C	b	no	Țerna, Saile et al. 2016
7	Cobani	2009	G	b	no	Rassmann et al. 2016
8	Cunicea I	2016	H	c	trial	unpublished
9	Cunicea II	2016	H	b	no	unpublished
10	Cunicea III	2016	H	b	trial	unpublished
11	Cunicea IV	2016	H	b	trial	unpublished
12	Găureni I	2015	B	c	trial	Țerna, Saile et al. 2016
13	Glavan I	1978-1979	G	c	yes	Dudkin, Videiko 2009
14	Horodca Mare	2009	E	b	yes	Popa et al. 2010
15	Ivanovca	1970-80's	G	b	no	Dudkin, Videiko 2009
16	Mihailovca VII	2016	A	b	no	unpublished
17	Nicolaevca V	2014	B, C	c	yes	Saile et al. 2016; Țerna, Dębiec et al. in print
18	Ochiul Alb	2009	F	b	no	Rassmann et al. 2016
19	Orheiul Vechi	1971	F	b	yes	Vinogradova et al. 1974
20	Petreni	2010-2011	G	c	yes	Rassmann et al. 2016
21	Putinești III	1989	E	c	yes	Dudkin, Videiko 2009
22	Putinești III	2016	E	c	yes	unpublished
23	Racovăț	1968	G	a	yes	Chernysh 1970
24	Rădulenii Vechi II	1970-80's	F	b	yes	Dudkin, Videiko 2009
25	Sacarovca I	1980	A	c	yes	Dudkin 1980
26	Sevirova II	1990	C	a	yes	Melniciuc 1991
27	Sîngerei	2010	G	c	no	Rassmann et al. 2016
28	Sîngerei XIX	2014	A, B, C	b	no	Țerna, Saile et al. 2016
29	Sofia II - Găvan	1990	G	b	trial	Dudkin, Videiko 2009
30	Sofia - la Moină I	1970-80's	G	c	no	Dudkin, Videiko 2009
31	Sofia - la Moină II	1970-80's	G	c	no	Dudkin, Videiko 2009
32	Stolniceni I	2015	G	c	yes	Țerna, Rassmann et al. 2016
33	Trifănești	1970-80's	E	c	no	Dudkin, Videiko 2009
34	Trinca - la Șanț	2016	G	c	yes	unpublished

Table 1. General data on geophysical investigations on the Neolithic and the Copper Age settlements from Moldova (*the capital letters mark the following cultural units (see also fig. 1-2): A – Starčevo-Criș culture; B – Linear Pottery culture; C – Precucuteni – Tripolye A; D – Bolgrad-Aldeni (Gumelnița); E – Cucuteni A – Tripolye B1; F – Cucuteni A-B – Tripolye B1-B2; G – Cucuteni B – Tripolye B2, C1; E – Tripolye C2 sites; ** the lowercase letters mark the following types of geomagnetic surveys: a – local survey to determine feature contours; b – settlement area partly prospected; c – settlement area fully prospected)

and covered several hectares. Unfortunately, the plot shows no clearly visible archaeological anomalies. Most probably, the settlement is completely destroyed.

Unfortunately, the prospections in Moldova did not provide clear results regarding the Starčevo-Criș settlement layout and internal division. Moreover, the only available settlement plan is the one obtained as a result of large-scale excavations in Sacarovca. Thus, survey of the early Neolithic sites has to be one of the main objectives for future geophysics between the Prut and the Dniester.

Linear Pottery culture (LBK; circa 5200-5000 BC)

Geomagnetic prospections were performed on 5 sites, two of them completely and three – partially scanned. All investigations are the recent ones, performed in 2014 and 2015 (see Saile *et al.* 2016; Țerna, Saile *et al.* 2016; Saile *et al.* in press).

1. *Sîngerei XIX* (Sîngerei district). The prospection from 2014 was made using a 4-channel Förster device and covered circa 3 ha (Țerna, Saile et al. in press). Several anomalies from dugout features were identified (Fig. 19); unfortunately, since the site is a multilayered one, there was no possibility to attribute these anomalies to a certain chronological horizon. It seems that most of the anomalies belong to the Precucuteni occupation level (see below).
2. *Chișcăreni XIV* (Sîngerei district). The prospection from 2014 was made using a 4-channel Förster device and covered circa 5,2 ha (Țerna, Saile *et al.* in press). The settlement area is partly eroded by a modern lake and covered with contemporary garbage. Nevertheless, several anomalies from dugout features were identified (fig. 7); unfortunately, since the site is a multilayered one, there was no possibility to attribute these anomalies to a certain chronological horizon. It seems that most of the anomalies belong to the Precucuteni occupation level (see below). The planigraphy of the surface LBK material (Fig.7: 2-3; 8) revealed its concentration rather in the central part of the investigated area; it is not to be excluded that some of the pits visible there belong to the Neolithic horizon. The site is less promising for further investigations.
3. *Nicolaevca V* (Sîngerei district). The prospection from 2014 was made using a 4-channel Förster device and covered circa 5 ha (Saile *et al.* 2016; Țerna, Saile *et al.* in press). The LBK and Precucuteni site is split in two parts by a modern road (information on the Precucuteni settlement is presented below). To the south there are multiple anomalies of medium and high amplitude, oriented on the NE-SW axis (Fig. 10). Their configuration and dimensions correspond to at least four LBK longhouses. In 2016, preventive excavations on the site included one anomaly from the southern part of the settlement which was earlier interpreted as a LBK longhouse with two parallel long pits and several possible postholes in its interior. In order to get

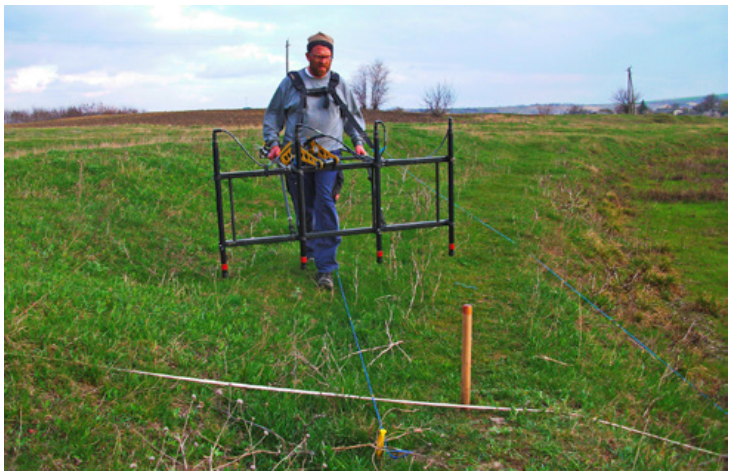

Fig. 5. 4-channel Förster magnetometer with a local grid system in use at Chișcăreni XIV (Photo by S. Țerna)

Fig. 6. 5-channel Sensys magnetometer with a GPS-system in use at Stolniceni I (Photo by S. Țerna)

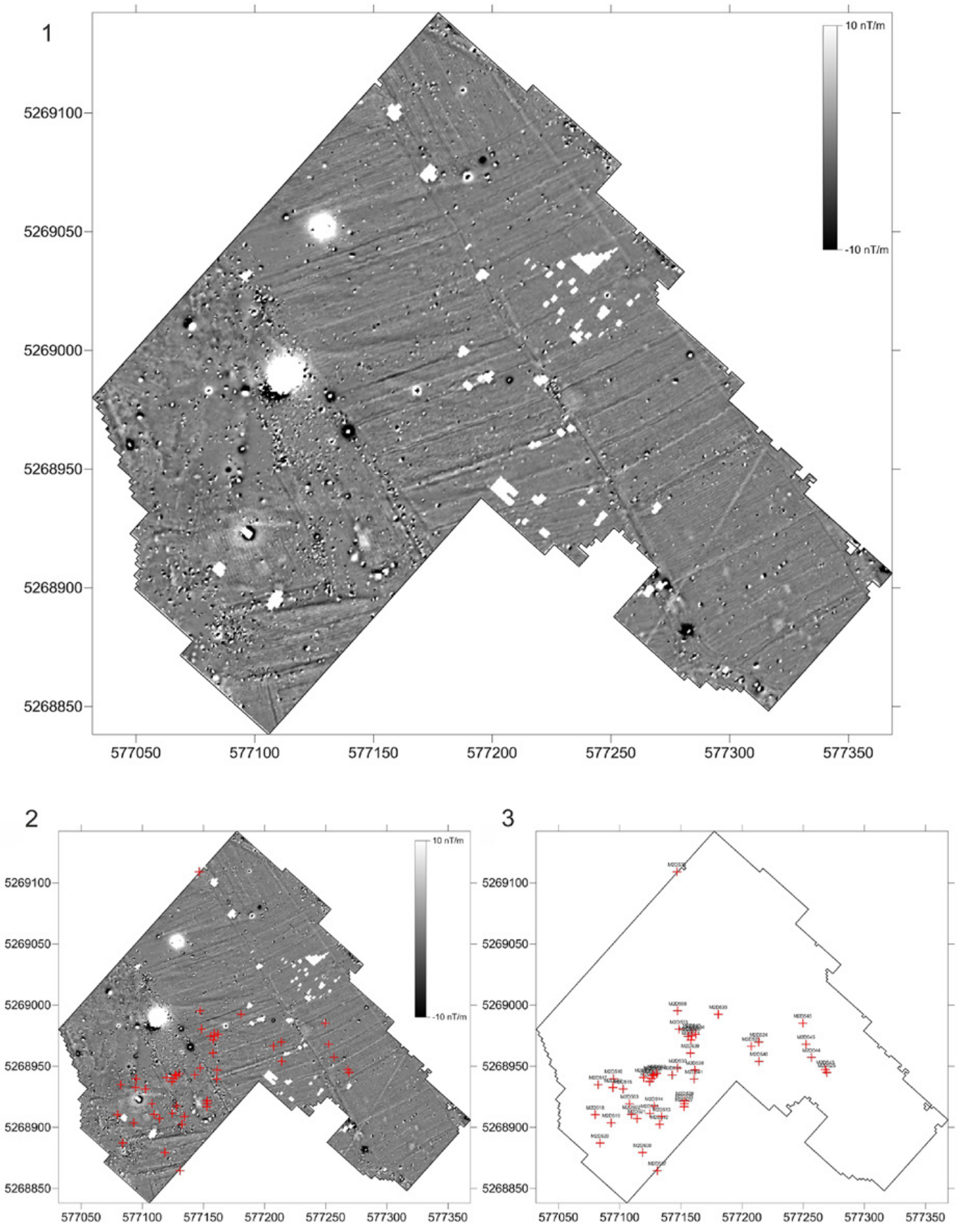

Fig. 7. Chișcăreni XIV. Geomagnetic plot and the distribution of surface finds (graphic M. Posselt)

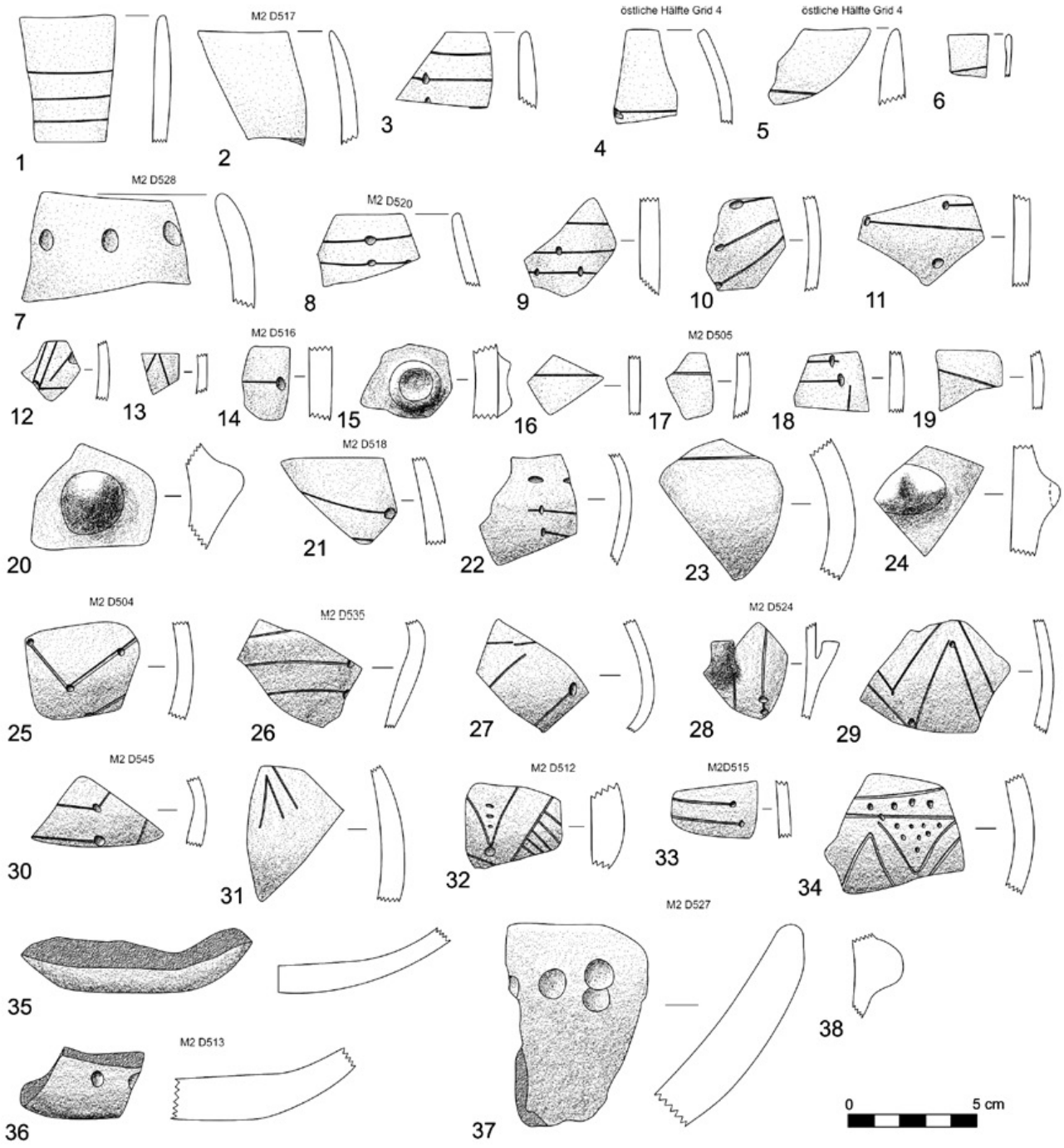

Fig. 8. Chișcăreni XIV. The LBK surface finds (Drawn by A. Bardeckij and S. Țerna)

a complete profile of the probable longhouse, a trench of 32 m² was opened perpendicularly to the main axis of the house (16×2 m) sectioning it, over the two long pits and the inner space with postholes. In the upper part of the fill both long pits contained burnt clay from the house debris; in one posthole parts of a large animal were deposited (Fig. 11). The trench yielded the abundant LBK material consisting of pottery and stone implements. Thus the excavations proved the accuracy of the plan as well as its interpretation, showing the long pits and some possible postholes (see Țerna, Dębiec *et al.* in press).

4. *Bumbăta III* (Ungheni district). The prospection from 2015 was made using a 4-channel Förster device and covered circa 2 ha (Saile *et al.* 2016; Țerna, Saile *et al.* in press). On the geomagnetic plan the limits of modern field parcels and some geological structures in the east are well visible (Fig. 13). Most of the archaeological anomalies are located in the central part of the plan. Two parallel rows of three small circular anomalies each belong to a SW-NE oriented LBK longhouse, as proved by a test-trench (Fig. 13). Some other anomalies (long pits) from possible longhouses are visible in

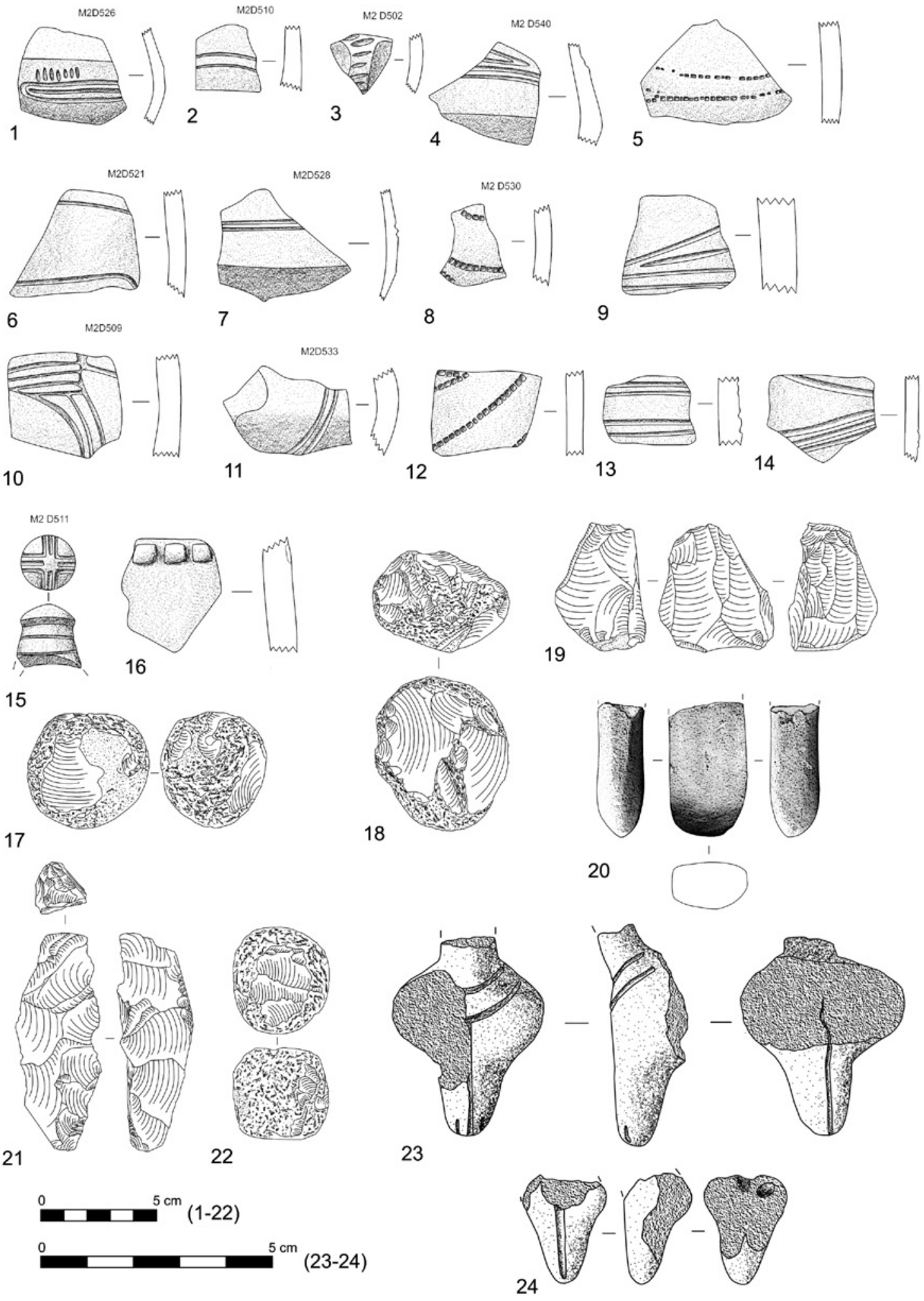

Fig. 9. Chișcăreni XIV. The Precucuteni – Tripolye A surface finds (Drawn by A. Bardeckij and S. Țerna)

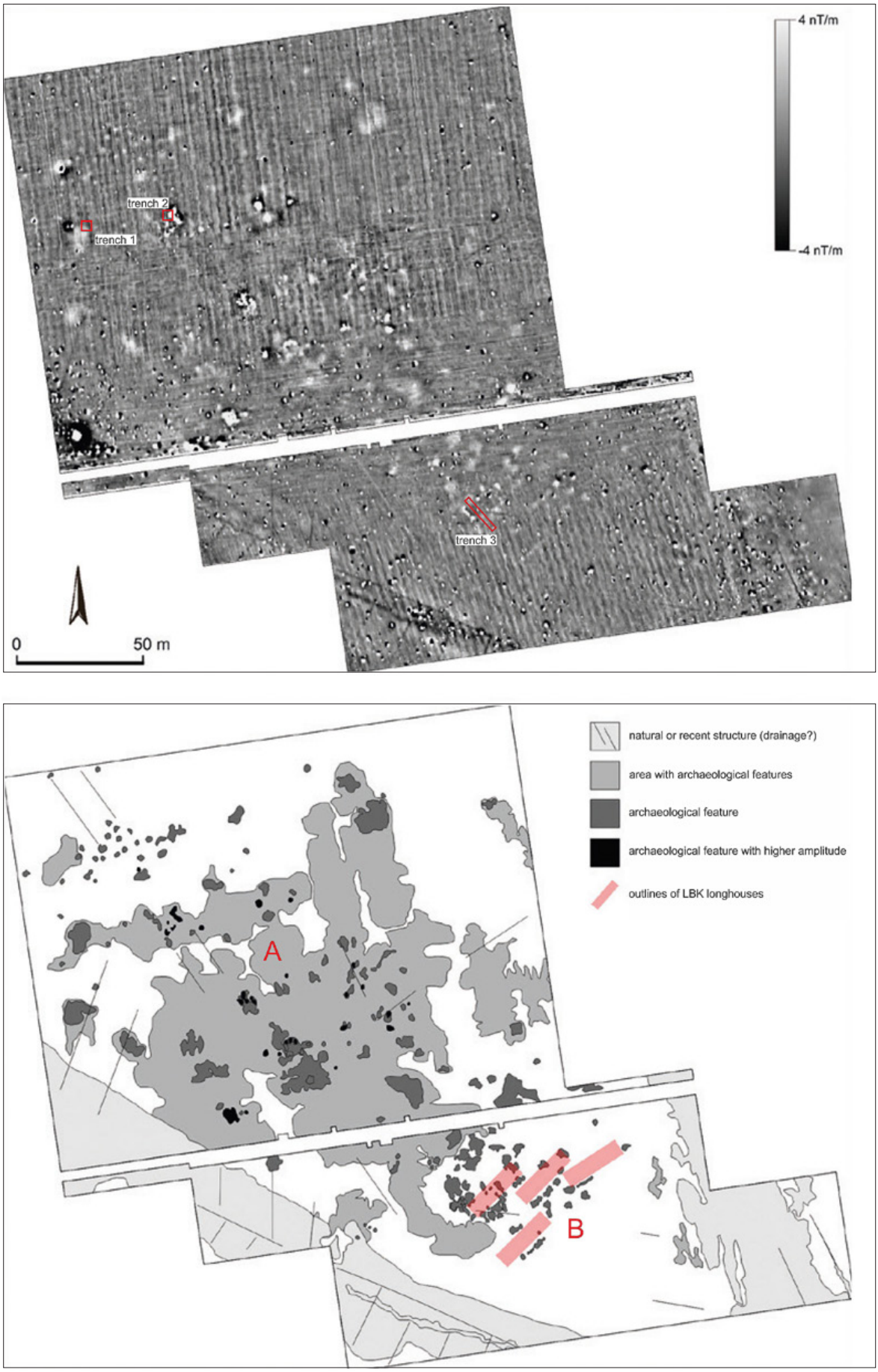

Fig. 10. Nicolaevca V. Geomagnetic plot with the location of 2016 excavation trenches and the interpretation of the geophysical plan. A – Copper Age settlement; B – LBK longhouses (graphic M. Posselt)

Fig. 11. Finds from the LBK long pits in Nicolaevca V (trench 3). 1 – burnt daub; 2 – deposition of animal bones (Photo by M. Dębiec)

Fig. 12. Copper Age features from Nicolaevca V. 1 – trench 2 with a burnt dwelling; 2 – trench 1 with a pit-house (Photo by S. Țerna)

the western part of the plan. The test-trench of 3×2 m over two of the small circular anomalies revealed that they belonged to postholes from a LBK longhouse (Fig. 14: A). One of the postholes from the central row had an impressive depth of 168-170 cm (Fig. 14: B-C).

5. *Găureni I* (Nisporeni district). The prospection from 2015 was made using a 4-channel Förster device and covered circa 3 ha (Saile *et al.* 2016; Țerna, Saile *et al.* in press) on the both sides of a village road (Fig. 16). Most of the Neolithic surface material was concentrated to the south-east from the road. Here, the prospection revealed anomalies corresponding to dug-out archaeological complexes. Despite of the generally low amplitude of the anomalies and their somehow blurred outlines, there are several long structures to be observed on the plan, oriented on the north-south axis (with a slight deviation eastward), interpreted as long pits accompanying the LBK longhouses. The anomalies corresponding to the easternmost dwelling, marked with nr. 1 (Fig. 16) are the most visible. In order to check the data from the geophysical plan, two small test-trenches measuring 2×2 m each were placed over two anomalies with different intensity – one over the probable western long pit of the dwelling nr. 1 (the anomaly with the higher amplitude) and the second over the probable eastern long pit of dwelling nr. 3 (the anomaly with the lower amplitude). Both test trenches validated the configuration and interpretation of the geomagnetic plot allowing us to partly investigate the LBK long pits with the contours heavily disturbed by bioturbations (Fig. 17). The archaeological inventory of the long pits consisted of daub, bones, pottery, stone implements and clay artefacts (Fig. 18).

Thus, prospections in Nicolaevca V, Bumbăta III and Găureni I turned out to be very successful proving that the long house, well-known from Central European settlements, represents the main architectural unit also for the LBK in the Prut-Dniester interfluve. The interpretation of the geomagnetic plan was validated by test-trenches of various sizes. These excavations showed that the LBK houses from Moldova display all of the constructional elements which are characteristic for similar dwellings in the west, like long pits parallel to the house and arrangements of postholes within the house's interior. New facts on the LBK architecture in Moldova brought us also to the reconsideration of previously ex-

Fig. 13. **Bumbăta III. Geomagnetic plot and its interpretation with the location of the test-trench (graphic M. Posselt)**

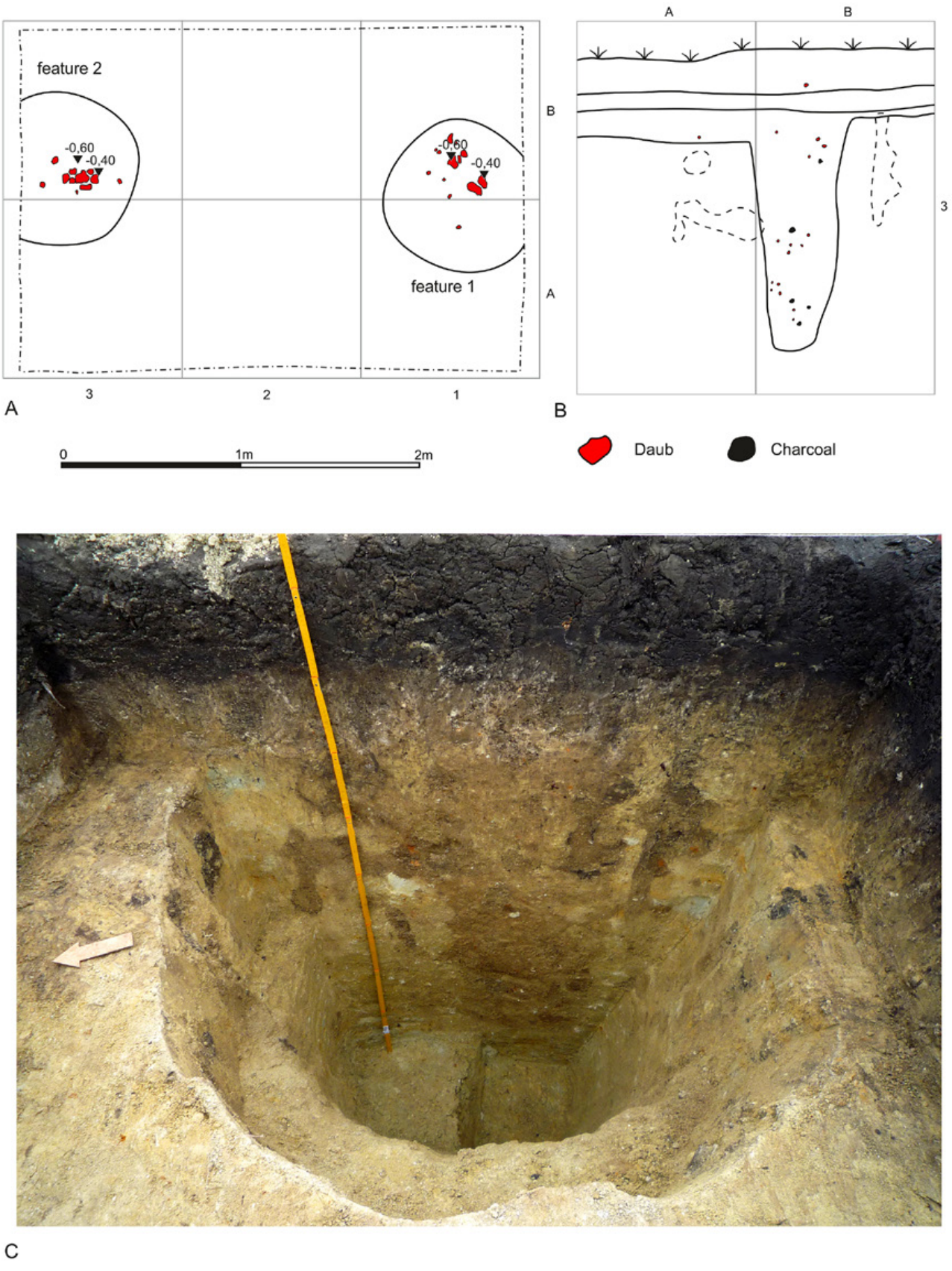

Fig. 14. **Test-trench from Bumbăta III with two postholes, one of them of significant depth (Drawn and photo by S. Țerna)**

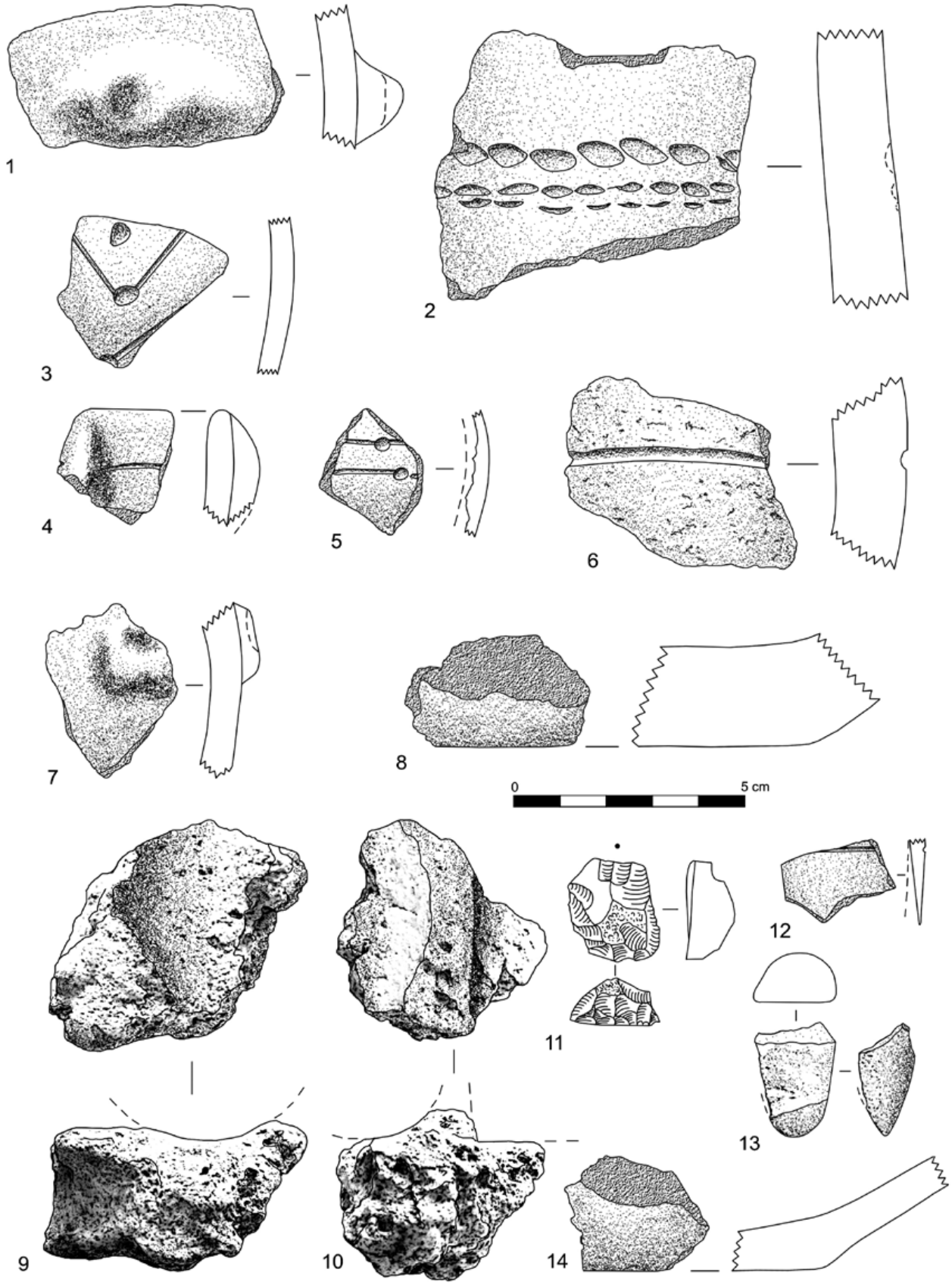

Fig. 15. **Bumbăta III. The LBK finds from the test-trench and the settlement's surface (Drawn by A. Bardeckij)**

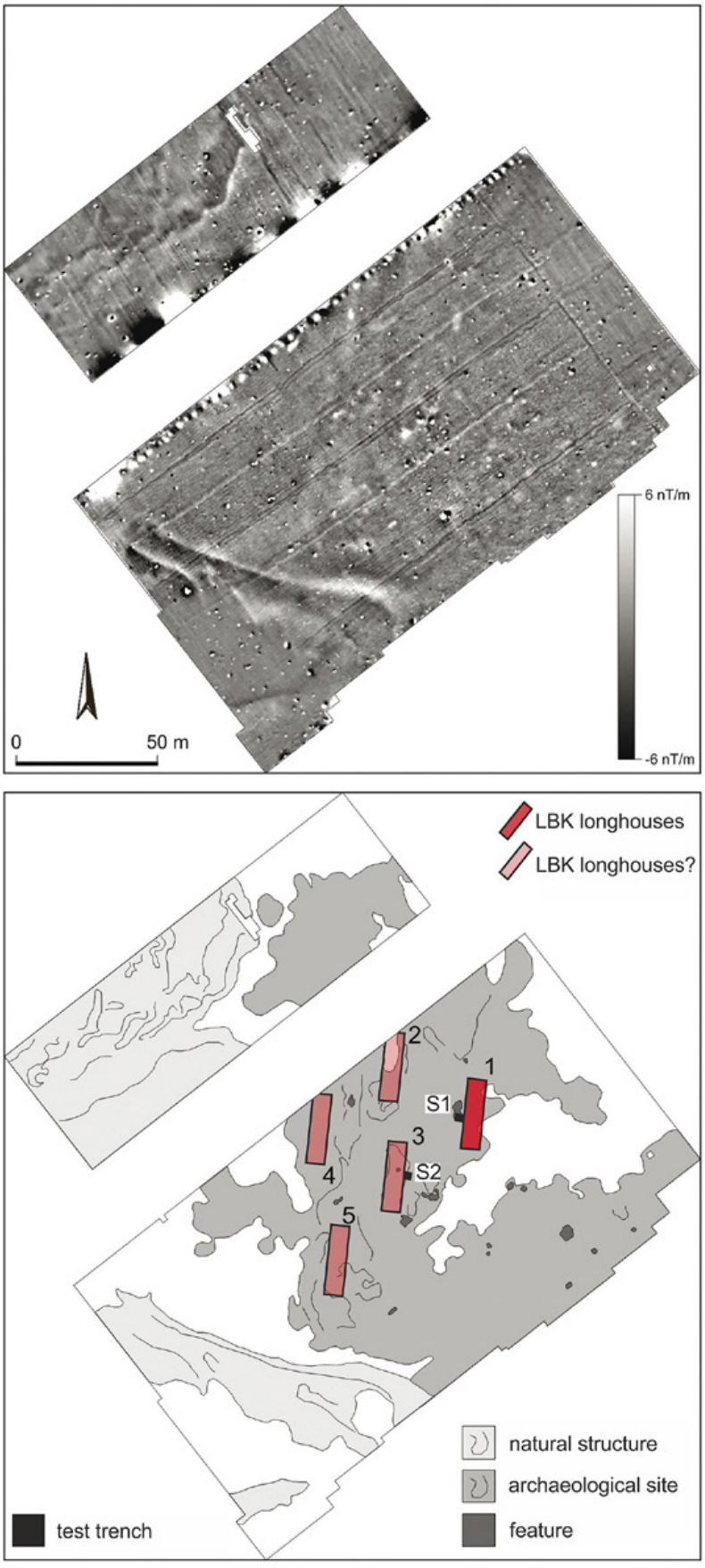

Fig. 16. **Găureni I. Geomagnetic plot and its interpretation with the location of the test-trenches (graphic M. Posselt)**

isting settlement plans (see Saile *et al.* 2016; Țerna, Saile *et al.* 2016; Saile *et al.* in print).

Precucuteni – Tripolye A chronological stage of the Cucuteni – Tripolye culture (circa 5000-4600 BC).

Geomagnetic prospections were performed on 4 sites. One older survey was performed in order to determine feature contours prior excavation. Other surveys are more recent; one of them provides interesting and well discernible results.

1. *Sevirova II* (Florești district). In 1990, a magnetometer was used in order to define the limits of an archaeological feature (burnt house) prior to excavations. Subsequent investigations conducted by I. Melniciuc proved the geomagnetic data and uncovered a light construction (probably, of seasonal use) with the dimensions of 4×5.4 m (Melniciuc 1991). One should remark that the archaeological feature lied at a considerable depth and the surface finds were very scarce; thus, the exact placing of the trench over the burnt house would have been much more problematic without the preliminary use of the magnetometer.
2. *Sîngerei XIX* (Sîngerei district). The prospection from 2014 was made using a 4-channel Förster device and covered circa 3 ha (Țerna, Saile *et al.* in press). Most of the surface material was concentrated near the road and probably represented the result of partial destruction of settlement features during the construction of the road (Fig. 19). Several other small concentrations of finds corresponded to the location of dugout archaeological features. Most of the artefacts belong to the Precucuteni – Tripolye A chronological stage (Fig. 20-21). Presumably, many of the pits visible on the plan can be dated back to the same period. Given the presence of the Criș, LBK and Precucuteni materials on the settlement, as proved by earlier fieldwalking and test trenches (see Wechler *et al.* 1998; Larina *et al.* 1997), continuation of the survey accompanied by several test-trenches over various anomalies could be a promising task for future research.
3. *Chișcăreni XIV* (Sîngerei district). The prospection from 2014 was made using a 4-channel Förster device and covered circa 5,2 ha (Țerna, Saile *et al.* in press). The mapping of surface finds revealed a concentration of Precucuteni mate-

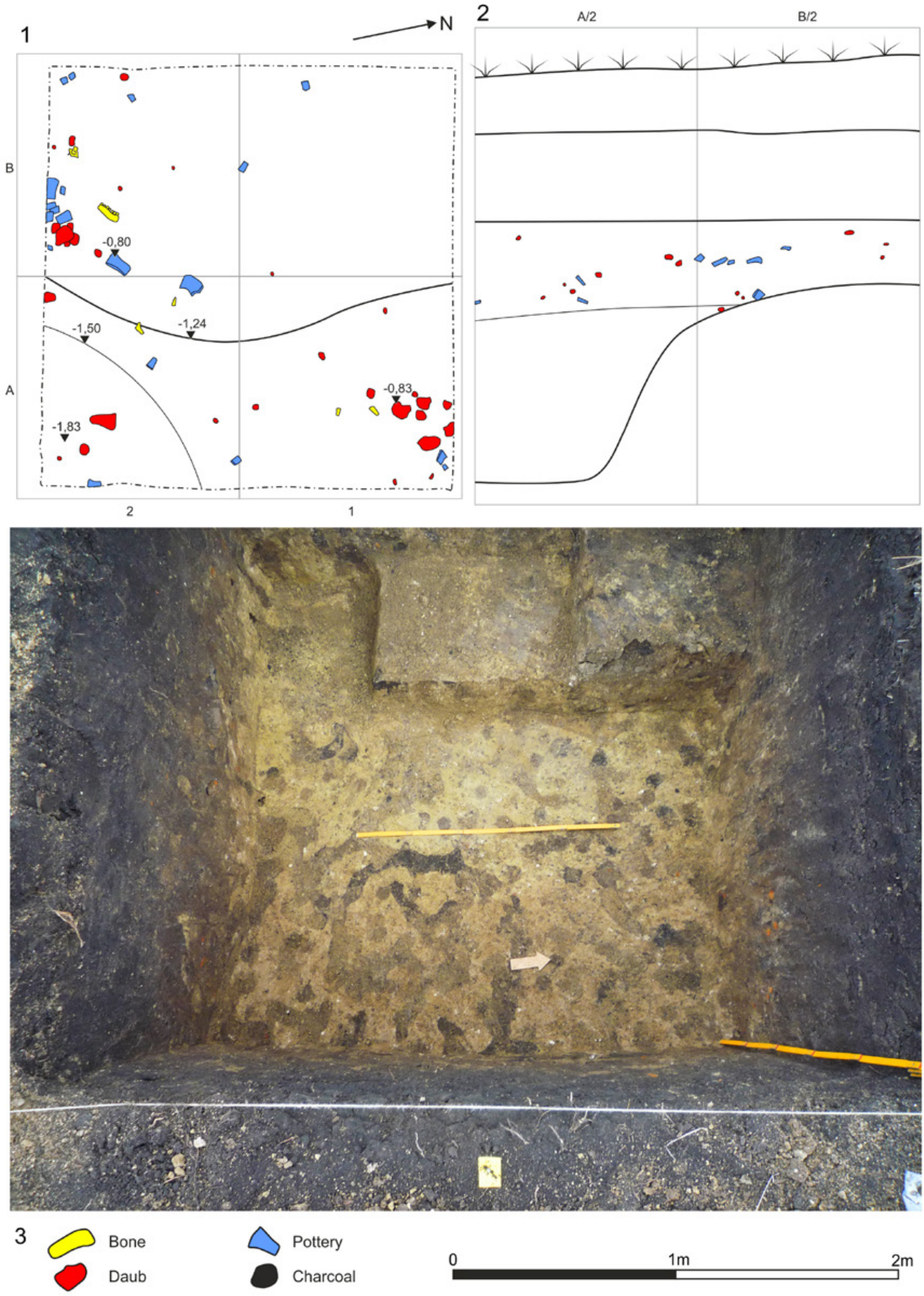

Fig. 17. **Test-trench 1 from Găureni I with a heavily bioturbated contour of a long pit (Drawn and photo by S. Țerna)**

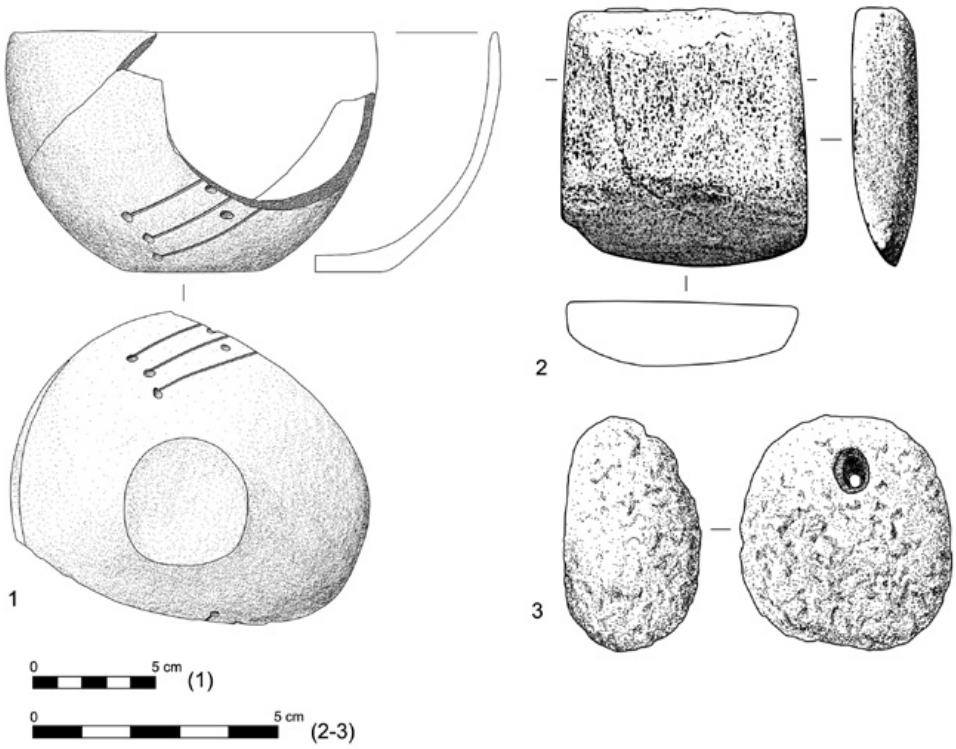

Fig. 18. Găureni I. The LBK finds from test-trench 1 (Drawn by A. Bardeckij)

rial (Fig. 9) in the south-western part of the settlement (Fig. 7). Here, on a slightly elevated sector several anomalies from dugout features can be observed, but the overall picture is heavily distorted by modern garbage and soil erosion. It is not to be excluded that a part of the Copper Age settlement was destroyed by the waters of the artificial lake located nearby. The site is less promising for further investigations.

4. *Nicolaevca V* (Sîngerei district). The prospection from 2014 was made using a 4-channel Förster device and covered circa 5 ha (Saile *et al.* 2016; Țerna, Saile *et al.* in press). To the north from the village road multiple anomalies of varying amplitude were detected. The distribution of surface finds indicated a clear concentration of Precucuteni archaeological material in this area. On the geophysical plan, anomalies with lower amplitude coming from dugout features display a peripheral layout of an approximately circular shape. In the central part of the settlement there are several structures with higher amplitude revealing the location of burnt houses. In the north-western part of the site an agglomeration of circular pits is visible (Fig. 10). In 2016, two trenches were opened in the northern part of the site, with presumably early Copper Age anomalies (Țerna, Dębiec *et al.* in press). The anomalies from the northern part of the site which had been tested by archaeological trenches had different amplitudes and intensity and had been interpreted earlier as a dugout complex ("pit-house") and an above-ground burnt dwelling (Fig. 12). The dugout anomaly was investigated by a trench of 16 m² and a subsequent extension of 6 m². The burnt high-amplitude anomaly was investigated by another 16 m². Thus the excavated surface in the northern part of the site reaches 38 m². In trench 1, a deep pit was partly investigated; most probably, representing a pit-house. In trench 2, the debris of an above-ground burnt dwelling was partly investigated.

Among the geomagnetic plots described above, the plan from Nicolaevca V is of particular interest, both due to the complete coverage of the settlement's area and its layout. Until now, there are not so many settlement plans available from the Precucuteni – Tripolye A chronological stage (Marinescu-Bîlcu 1974; Bodean 2001; Zbenovič 1989; 1996; Dudkin and Videiko 2004). However, two main patterns are to be observed: the "row" pattern (complexes arranged in more or less straight rows) and the "circular" pattern (houses arranged in more or less circular/oval pattern with a centre and periphery). The first pattern is documented both by excavations and geomagnetic research (like on the final Precucuteni I settlement in Baia – În Muchie (Suceava county, Romania), prospected in 2015 by Robert Hofmann and Stanislav Țerna; cf. Hofmann *et al.* in press; Țerna, Hofmann *et al.* in press). The second one is rarer and is known just from three settlements, excavated (Bernashevka – Zbenovič 1980, fig. 3, Slobodka-Zapadnaia – Patokova *et al.* 1989, fig. 1: 2) or prospected geomagnetically (Mohilna II – Dudkin and Videiko 2004, 306).

Basing on available data, Nicolaevca V is the first Precucuteni – Tripolye A settlement with dugout fea-

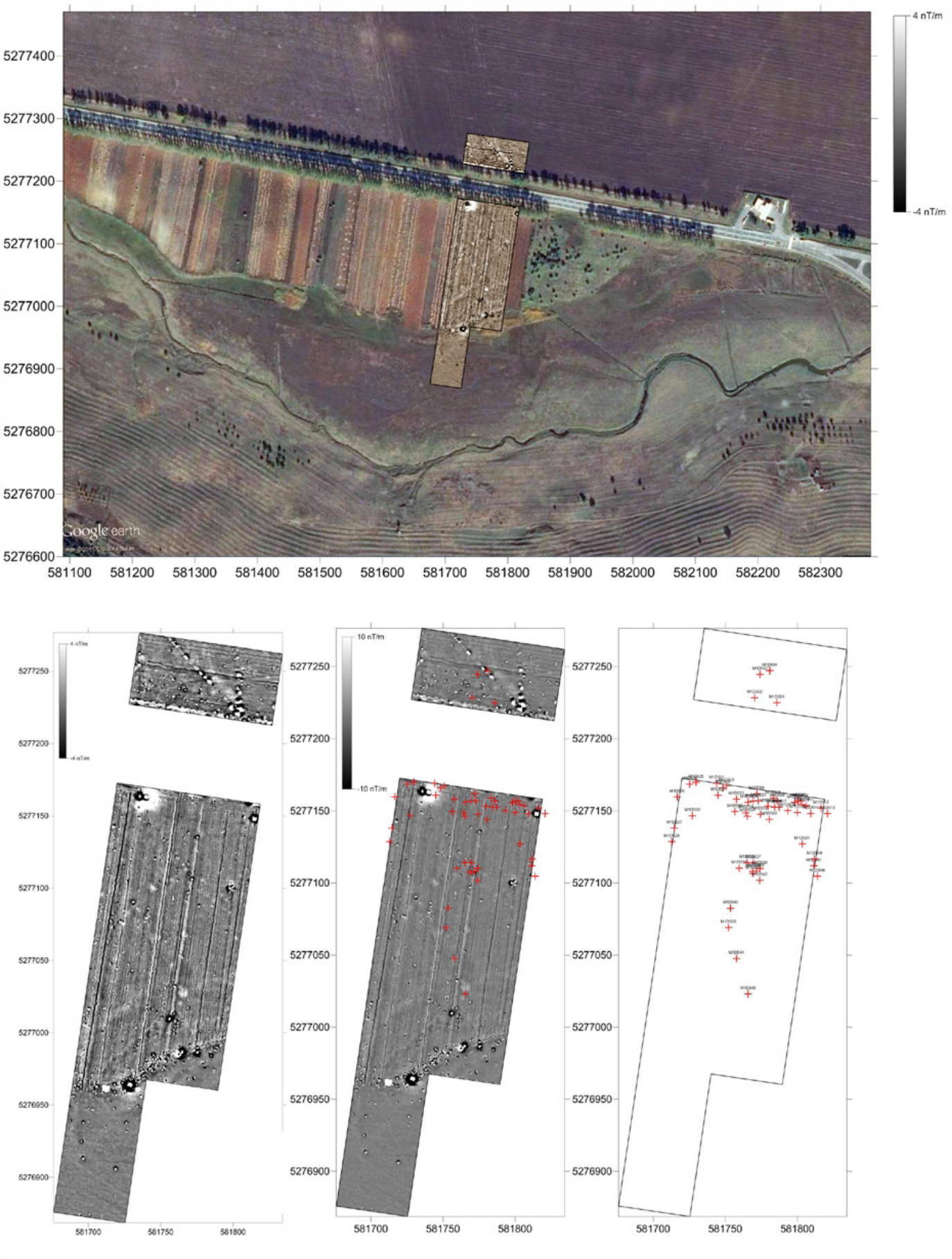

Fig. 19. Sîngerei XIX. Geomagnetic plot and the distribution of surface finds (graphic M. Posselt)

tures arranges in a "circular" layout found by means of geomagnetic research or archaeological excavation. All of the Precucuteni-Tripolie A "circular" sites (Bernashevka, Slobodka-Zapadnaia and Mohilna II) display burnt houses and no dugout complexes. All of the other Precucuteni – Tripolye A settlements consisting basically of dugout complexes display a "row" pattern. Here, one could name the examples from Lenkovtsy (Chernysh 1959; on this settlement five above-ground burnt dwellings and five dugout large features were discovered), Bernovo-Luka (Passek 1961, 42-60), Luka-Vrublevetskaia (Bibikov 1953) and Florești (Passek 1960). Of course it should be taken into account that most of the above-mentioned settlements have been not excavated completely.

Bolgrad-Aldeni (Gumelnița) culture (circa 4700-4500 BC)

Two settlements in Southern Moldova were surveyed in 2011-2012 by P. Zidarov (unpublished). On both burnt houses and ditches were encountered.

Cucuteni A – Tripolye B1 chronological stage of the Cucuteni – Tripolye culture (circa 4600-4150 BC).

For this chronological stage, 5 geomagnetic plots are available. Three of them are older and three – recent ones. One site has been scanned twice providing interesting data for comparing the plans obtained with different generations of geomagnetic equipment.

1. *Brînzeni-Ostrov* (Edineț district). The geomagnetic prospections performed by V. Dudkin in the 1970-80's covered an area of 6.5 ha; thus, the site has been scanned entirely. The settlement has an area of circa 4.5 ha and consists of 120 anomalies of various dimensions; at least 80 of them represent remains of burnt houses (Fig. 22). These constructions are concentrated in groups of 2 to 8-10 houses each. Groups of dwellings form several rows oriented NW-SE, each row with a length of 150-200 m. The largest anomalies are placed in the centre of the settlement. Generally, the dimensions of these burnt houses vary from 3×7 to 4-5×9-12 and 8×16 m. Small circular anomalies from pits can be identified near most of the houses (Dudkin and Videiko 2009).
2. *Trifănești* (Florești district). The geomagnetic prospections performed by V. Dudkin in the 1970-80's covered an area of 7,2 ha. 51 anomalies from archaeological features are concentrated on an area of circa 3 ha (Fig. 23). The analysis of the geomagnetic plot allows the differentiation of two categories of the anomalies which can be assigned to different historical periods. First of them refers to the remains of at least 12 Copper Age burnt houses in the north-western part of the prospected area (Fig. 23: A). These dwellings have a rectangular shape, with a width of 4-6 m and a length of 10-17 m. They are arranged individually or in small groups of 2-3 dwellings each. Alongside burnt dwellings, anomalies from circa 12 pits have been identified. The second category (Fig. 23: B) includes about 13 rectangular anomalies of 5×5 m each. Most probably, these are coming from dugout dwellings of the Sântana de Mureș - Cerneahov culture which is dated back to first centuries AD (Dudkin and Videiko 2009).
3. *Putinești III* (Florești district). The geomagnetic prospections performed by V. Dudkin in 1989 covered an area of 7 ha. The settlement has circa 5 ha and is partly destroyed by heavy ploughing. About 80 anomalies of varying amplitude have been identified on the geomagnetic plot (Fig. 24). Most of them come from burnt houses arranged in rows which form several rectangular or oval „residential quarters". These „quarters" include about 10-15 buildings on the perimeter and, in some cases, one or two buildings in the centre (Dudkin and Videiko 2009). The latest geomagnetic prospection was performed by Hofmann and Țerna in spring of 2016 (unpublished). In general, they confirmed the disposal of archaeological features from Dudkin's plan. At the same time, prospection with modern high-resolution led to a much clearer delimitation of house contours as well as to identification of previously unknown important features as a massive, most probably defensive ditch with possible palisade.
4. *Brănești* (Orhei district). Geomagnetic prospection from 2014 was made using a 5-channel Förster device and covered circa 0,35 ha (Meyer *et al.* 2016). Here, the prospection revealed the southern border of the Copper Age and the La Tene site (Fig. 25). In the western part of the plan three large rectangular anomalies can be seen; another two similar structures are located to the north-east, oriented at an angle of 90°. Further to the south, another four rectangular anomalies can be observed. All these anomalies, together with some of the pits, belong to the Copper Age horizon, as proved by means of several test-trenches. The ceramic material from the excavations allows dating the Copper Age settlement to the Cucuteni A – Cucuteni A-B transition. I would like to thank Dr. Octavian Munteanu (Chișinău) for providing me with photos of the unpublished Copper Age pottery from the test-trenches.
5. *Horodca Mare* (Ialoveni district). Geomagnetic

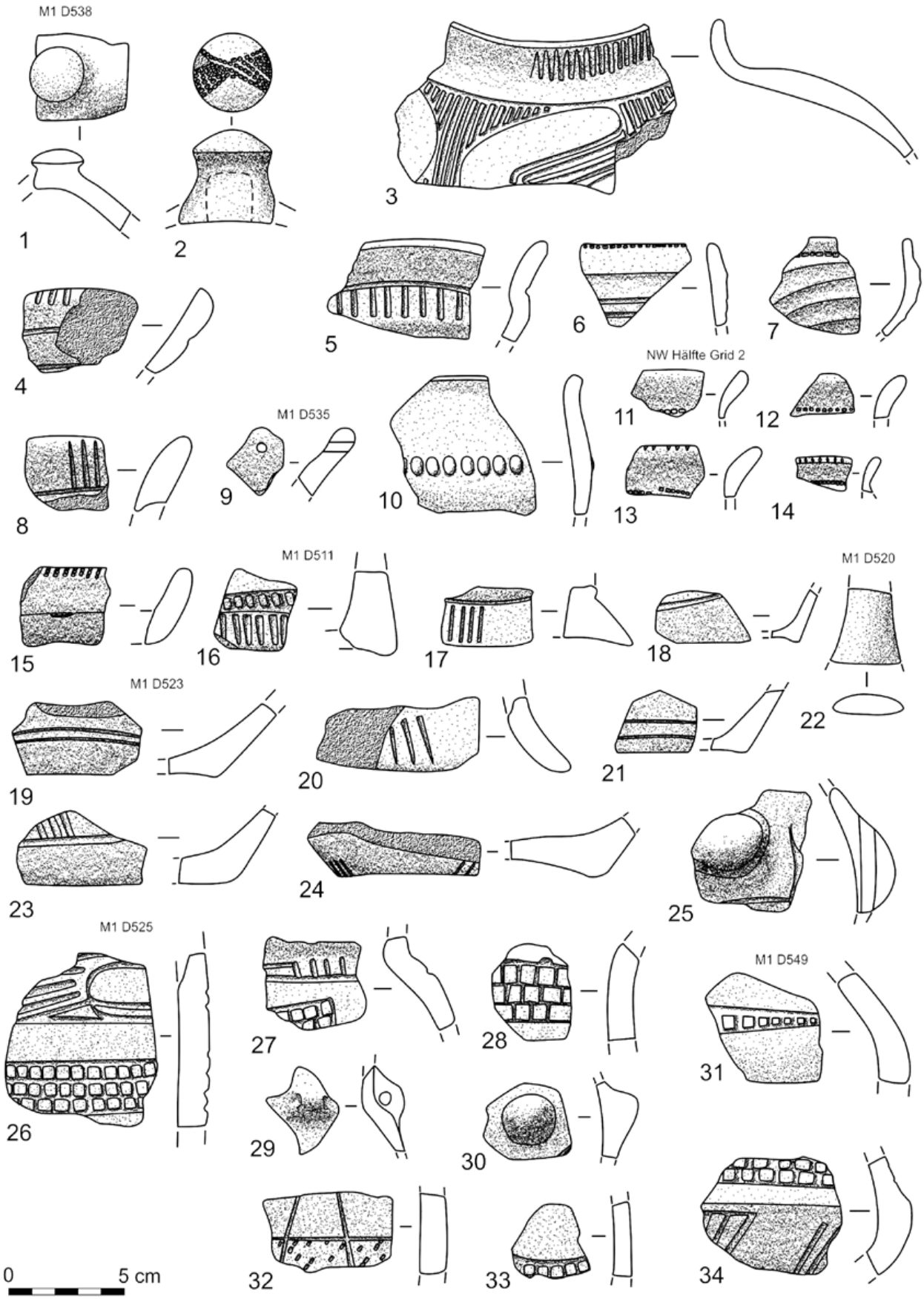

Fig. 20. Sîngerei XIX. The Precucuteni – Tripolye A surface finds (Drawn by A. Bardeckij and S. Țerna)

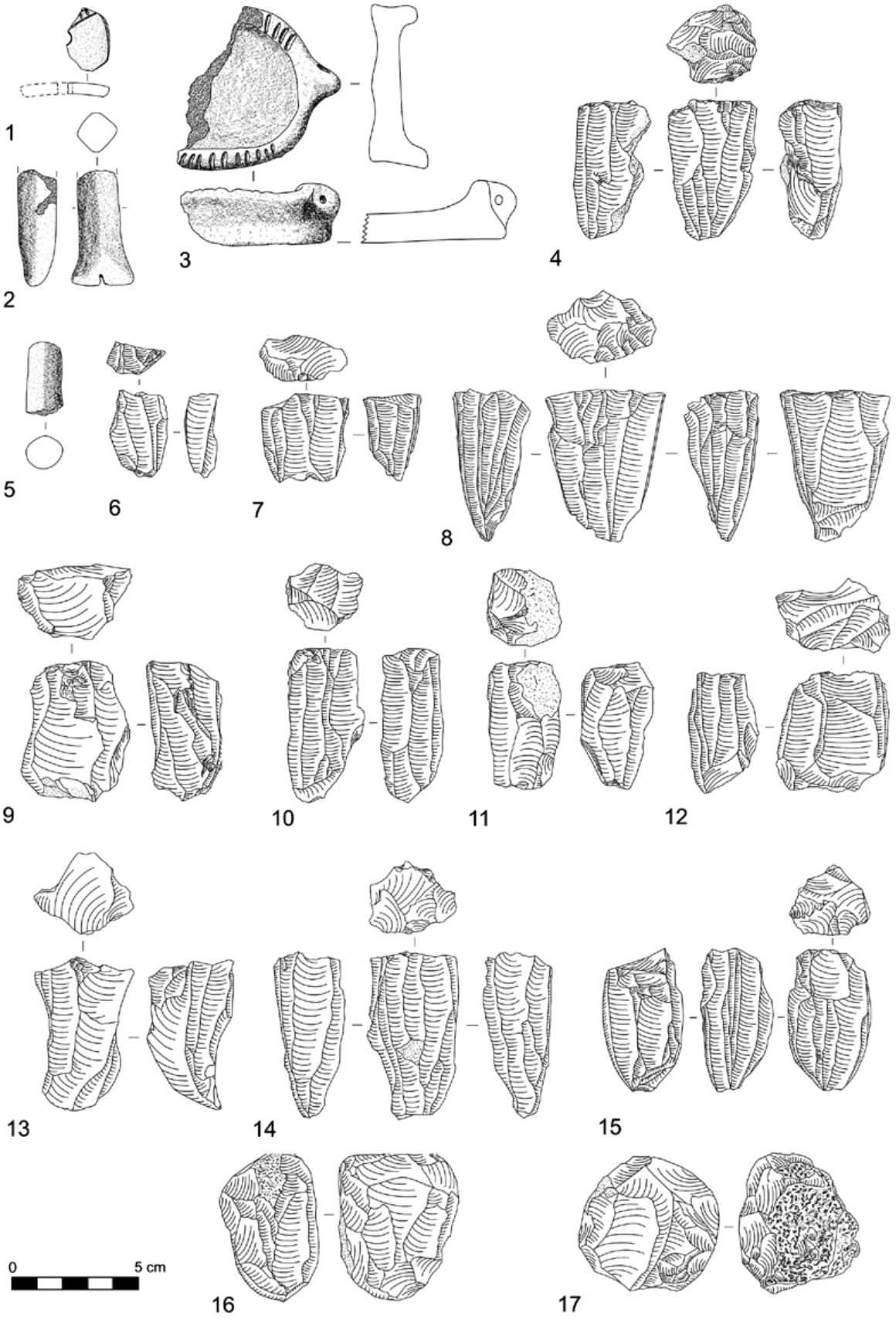

Fig. 21. Sîngerei XIX. The Precucuteni – Tripolye A surface finds (Drawn by A. Bardeckij)

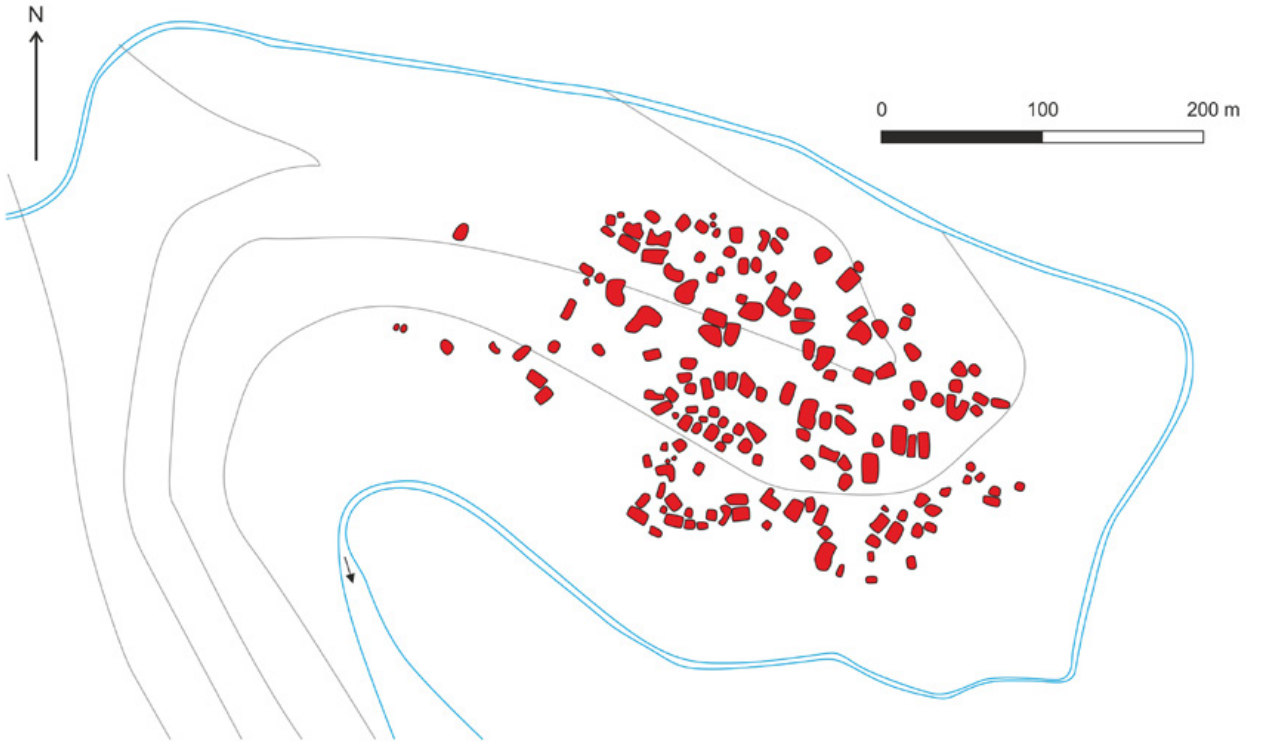

Fig. 22. Brînzeni-Ostrov. Interpretation of the geophysical plan (redrawn after V. Dudkin)

prospections were performed in 2009 with a 5-channel Förster device (Popa *et al.* 2010). In the northern part of the geomagnetic plot, several rectangular anomalies can be observed; most probably, these reflect the location of burnt Copper Age houses (Fig. 26: 4). A possible NW-SE oriented ditch is visible to the south of the rectangular anomalies.

Despite the incompleteness of several surveys, the Cucuteni A – Tripolye B1 geophysical plans reveal the same pattern in the settlement layouts, namely burnt houses arranged in smaller groups forming elongated rows of a different degree of regularity. This kind of the layout is typical for settlements of this period between the Carpathians and the Dniester (Sorochin, 1993, 75-78) and is proved both by large-scale excavations (Truşeşti: Petrescu-Dîmboviţa *et al.* 1999; Hăbăşeşti: Dumitrescu *et al.* 1954; Drăguşeni: Marinescu-Bîlcu and Bolomey, 2000) and geophysics (Adâncata: Hofmann *et al.* in print, Ţerna *et al.* in print; Scânteia: Mantu *et al.* 2016).

Cucuteni A-B – Tripolye B1-B2 chronological stage of the Cucuteni – Tripolye culture (circa 4150-3800 BC)

Three geomagnetic surveys have been conducted on settlements from this period. All of them are incomplete.

1. *Orheiul Vechi* (Orhei district). The prospection was performed in 1971 by G.F. Zagnii. According to the available information, the plan revealed seven burnt dwellings. An archaeological trench was opened over one of the dwellings uncovering a rectangular heavily damaged burnt house (Vinogradova *et al.* 1974, 67).
2. *Rădulenii Vechi II* (Floreşti district). The geomagnetic prospections performed by V. Dudkin in the 1970-80's covered an area of 12.6 ha or about 2/3 from the total area of the site. A total number of 130 anomalies from archaeological features of various sizes was identified (Fig. 27). Three main structural areas of the settlement are visible on the plan: the circular core with a diameter of circa 160 m and 42 anomalies (Fig. 27: A), a large rectangular area of 270×180 m with 66 anomalies of various sizes (Fig. 27: B) and a rather chaotic agglomeration of 12 anomalies in the northern part of the site (Fig. 27: C). Within the settlement's core, anomalies are very large with a width of 6-10 and length of 10-30 m. The interspaces between some of them are pretty wide suggesting the existence of causeways or paths. The largest dwellings are located in the centre of the settlement; some of them have an area of several hundreds of square meters. Alongside these central dwellings, smaller anomalies might indicate the presence of pits (Dudkin and Videiko 2009). Excavations conducted by V. Marchevici uncovered several burnt houses (Marchevici 1994); one of them had the dimensions of 7×20 m and was therefore an archaeological argument for the presence of larger dwellings within the site.
3. *Ochiul Alb* (Drochia district). In 2009 an area of 0.5 ha was prospected with a 5-channel Sensys magnetom-

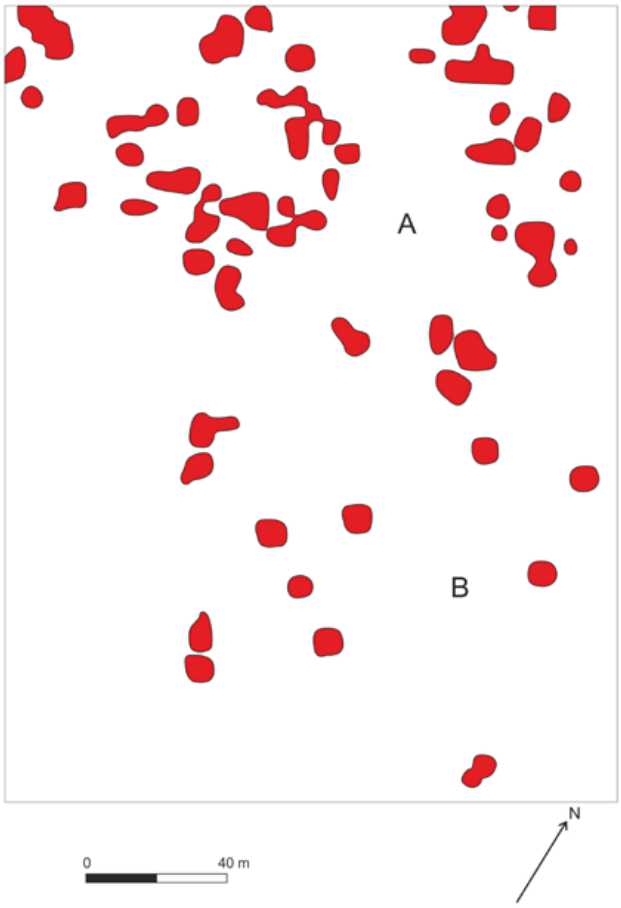

Fig. 23. **Trifănești. Interpretation of the geophysical plan (redrawn after V. Dudkin)**

eter. This small scale survey revealed an enclosed settlement with a low density of circa 20 small buildings. The width of the circular ditch is 2 m and it encloses an area of 3.2 ha (Fig. 28). About 20 pits are visible; the amplitude of their anomalies is varying. Therefore some of the pits have probably been backfilled with settlement garbage or burnt daub (Rassmann *et al.* 2016).

Out of the surveys presented above, only the one from Rădulenii Vechi II offers a somehow clearer insight into the settlement's layout. The circular core with houses oriented to the centre of the settlement represents a pattern which becomes quite widespread in the Cucuteni A-B – Tripolye B1-B2 stage with further evolution in the Cucuteni B period (Sorochin 1993; Melniciuc 2011). Existence of larger dwellings in the central part of the settlement is documented on some sites starting from the Precucuteni stage (Hofmann *et al.* in print; Țerna *et al.* in print); it seems however that this feature starts to occur more regularly on Romanian Cucuteni A-B settlements like Corlăteni (Nestor *et. al.* 1951) or Ripiceni (Boghian *et al.* 2016). Big settlements with a circular structure are also known in Ukraine (Dudkin and Videiko 2004). The circular ditch revealed at Ochiul Alb is interesting. Further investigations of this settlement should provide a better understanding of its inner structure.

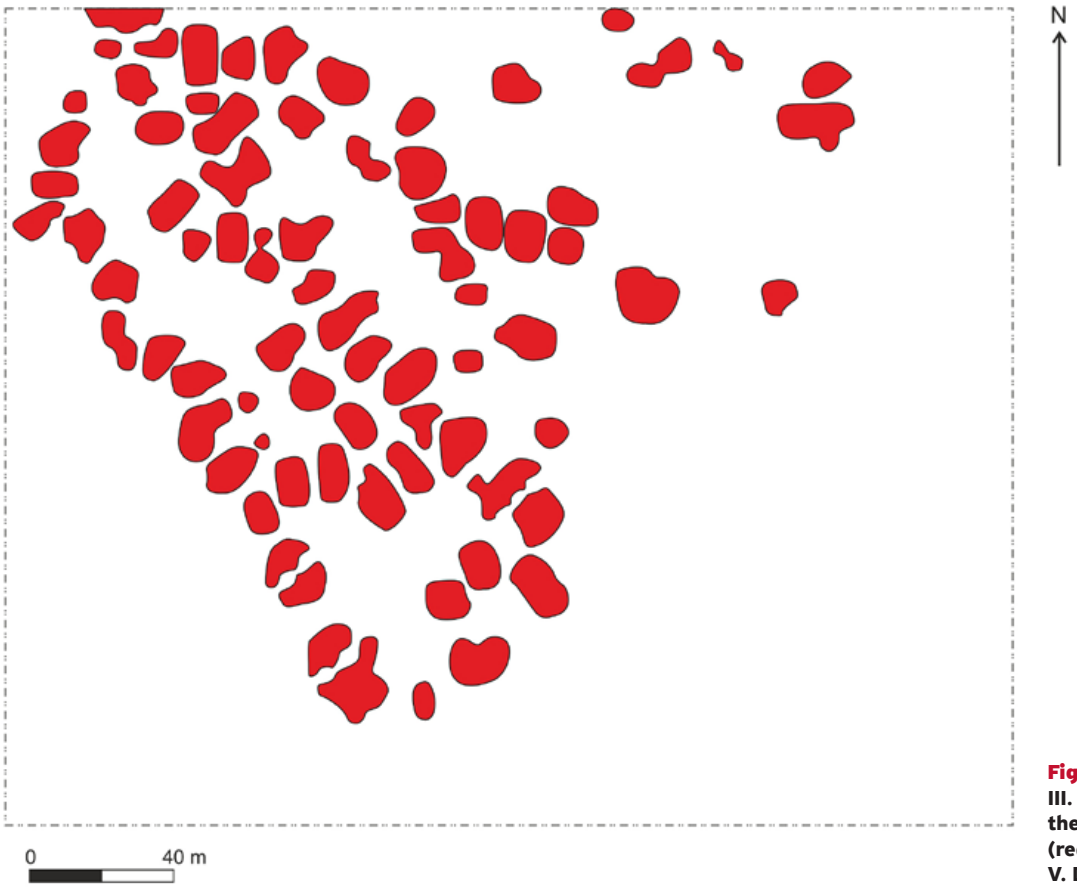

Fig. 24. **Putinești III. Interpretation of the geophysical plan (redrawn after V. Dudkin)**

Fig. 25. **Brănești. Geophysical plot (after Meyer *et al.* 2016)**

Cucuteni B – Tripolye B2, C1 chronological stage of the Cucuteni – Tripolye culture (circa 3800-3500 BC)

As pointed above, this stage has provided most of the geophysical plans. 11 surveys have been conducted, among these 6 are older and 5 are newer ones. The settlement layouts from this period are remarkable for their complexity.

1. *Ivanovca* (Florești district). The geomagnetic prospections performed by V. Dudkin in the 1970-80's covered an area of 7,2 ha. Judging by the configuration of the anomalies from the plan, the prospection encompassed about 60-70 % of the settlement's area. Thus, the site could have a surface of 10-12 ha. About 150 anomalies of various sizes were identified. The plot partly covers the perimeter of a structure with the dimensions of circa 250×300 meters. This structure is composed of rectangular anomalies with the width of 8-15 m and length of 15-25 m. The interspaces between the narrow sides of the dwellings are 2-3 m and rise up to 8-15 m in the areas where causeways and paths have been. The planigraphy of the site presents two rows of anomalies arranged perpendicularly (Fig. 29: A). In the opinion of V. Dudkin and M. Videiko, these anomalies come from burnt houses which could have had a defensive function (Dudkin and Videiko 2009). It is nevertheless possible that these linear rows of anomalies represent in fact the settlement's outer ditch with a rectangular configuration. Inside this enclosure houses are arranged along the „streets" and within „quarters". One central cluster of houses has a curvilinear shape and could point towards the inner oval of dwellings from the settlement's structure (Fig. 29: B). Between the houses groups there are large surfaces without any geomagnetic anomalies; also, there are several features visible outside the main perimeter of the settlement. Some rectangular anomalies with the dimensions of 5×5 or 6×6 m are located in the southern part of the site. Most probably they represent early Medieval pit-houses (Fig. 29: C).
2. *Racovăț* (Soroca district). The very first geomagnetic prospection on a prehistoric site in Moldova took place here, in 1968, and was conducted by G.F. Zagnii who used the M-23 magnetometer to determine the outline of a burnt house for subsequent excavation. The survey allowed the specialists to identify an anomaly of circa 14×7.5 m (Chernysh 1970, 14). The excavations proved the accuracy and precision of geophysical data (Fig. 30).
3. *Sofia la Moină I* (Drochia district). The site is located on a high triangular promontory over the valley of a small river. Its surface is circa 7.5 ha. The contour of the settlement follows the configuration of the prom-

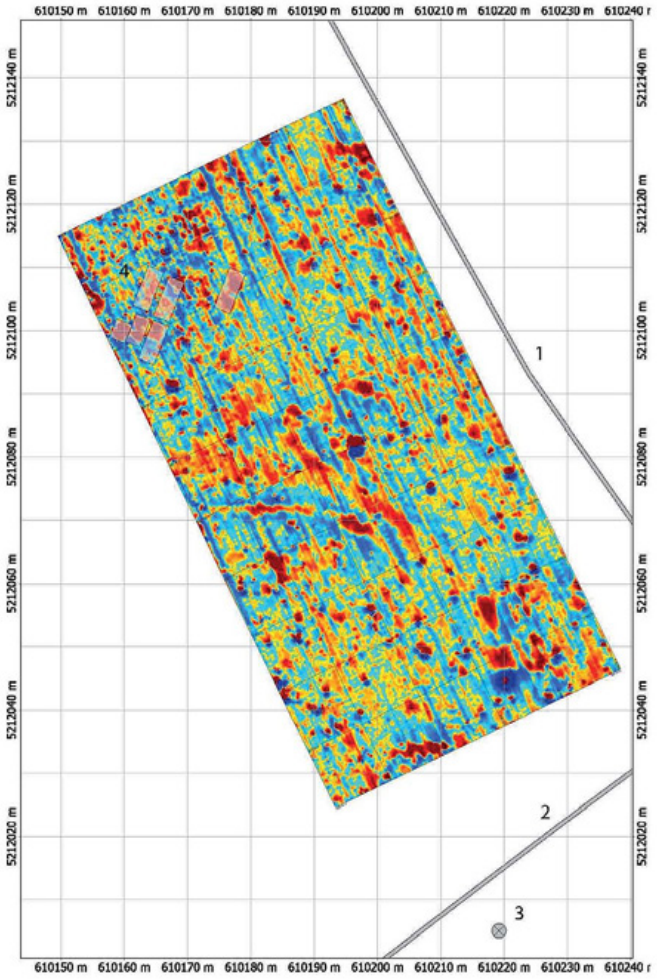

Fig. 26. Horodca Mare. Geophysical plot (after Popa *et al.* 2010)

ontory (Fig. 31: A). The geomagnetic prospections performed by V. Dudkin revealed around 100 house-anomalies and a large number of pits. The settlement layout is composed of several elongated rows intersected by shorter ones. The interspaces between these rows are sometimes filled with houses, forming several groups. Closer to the centre there is a circular alignment of dwellings. Dimensions of anomalies vary; the length is 10-20 m and the width 4-8 m (Dudkin and Videiko 2009).

4. *Sofia la Moină II.* The settlement *La Moină II* is located opposite to the first site, on the gentle slope of the terrace. The site extends for c. 450 m along the riverbank over an area of circa 8 ha. According to the geomagnetic survey of V. Dudkin, the settlement is composed of two circular parts of approximately the same dimensions (Fig. 31: B). Each includes two main circles of houses. The external circle of each sector has a diameter of circa 200-230 m while the inner one has a diameter of 100-120 m. Houses vary in sizes from 40 to 150 m^2. Most of the houses are oriented to the centre of the concentric layout. The settlement could consist of circa 90 houses in both sectors. According to the

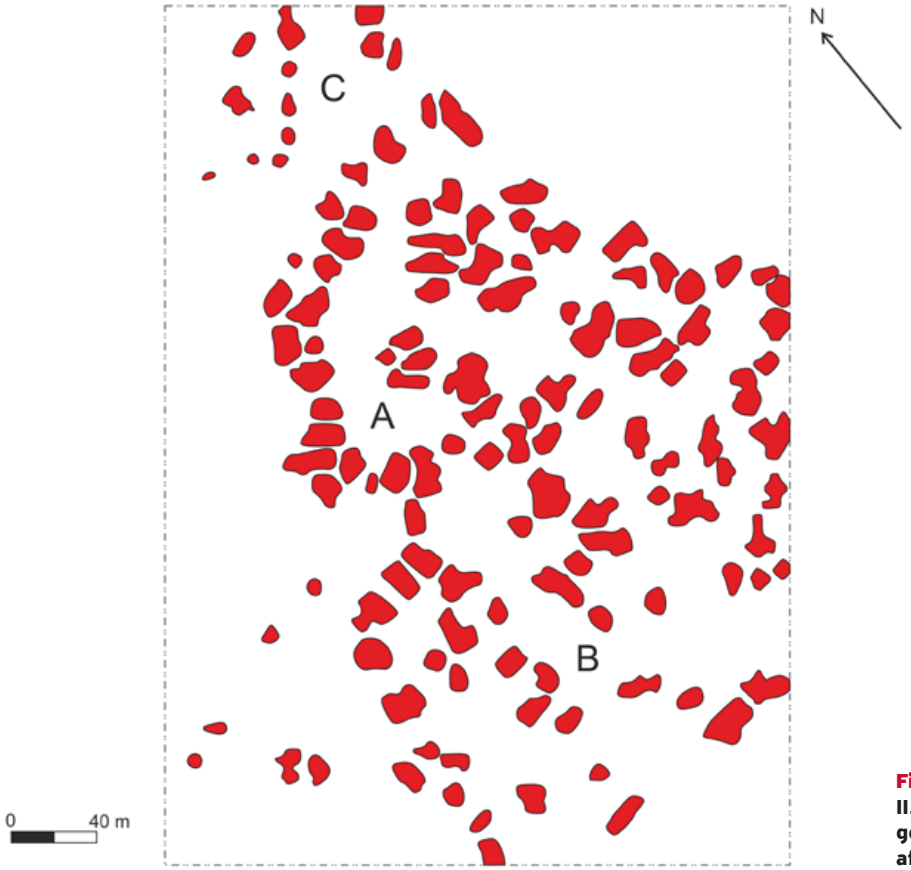

Fig. 27. Rădulenii Vechi II. Interpretation of the geophysical plan (redrawn after V. Dudkin)

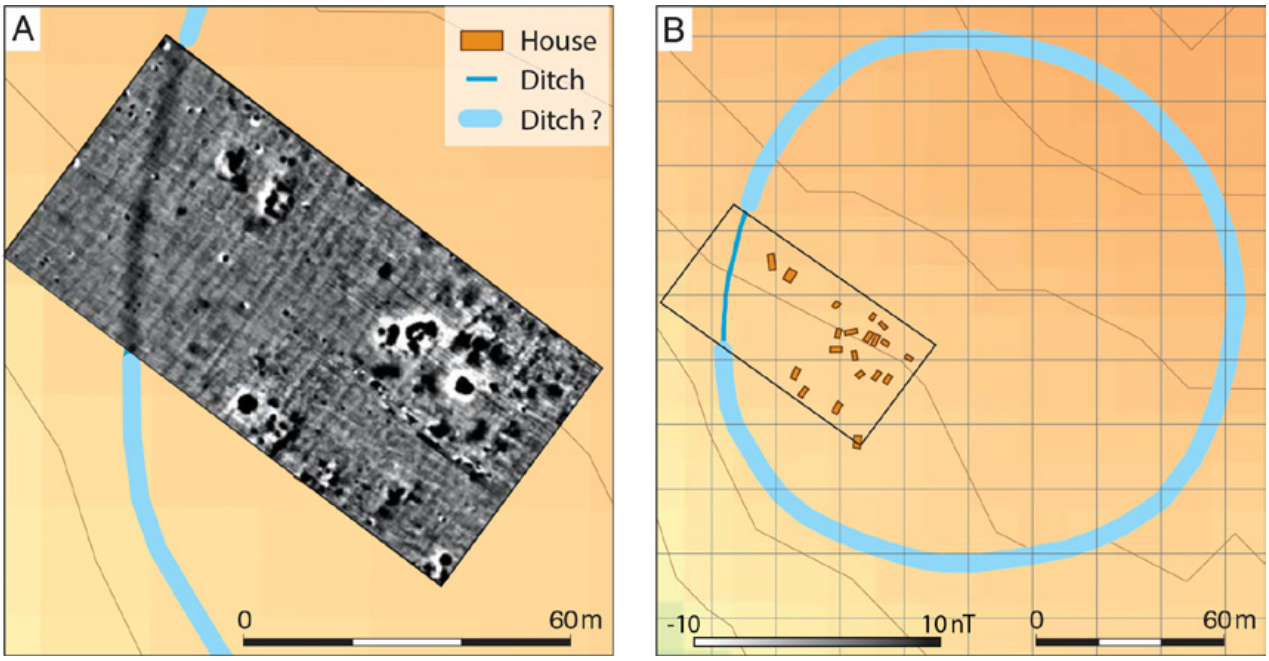

Fig. 28. Ochiul Alb. Geophysical plot and its interpretation (after Rassmann *et al.* 2016)

surface material both sites (Sofia la Moină I and Sofia la Moină II) are synchronous and can be assigned to the Petreni group. If this supposition is true, than the settlements could form a single system with two elements. The number of houses on both sites is close to 200 (Dudkin and Videiko 2009).

5. *Sofia II – Găvan* (Drochia district). The geomagnetic survey was made by Dudkin in 1990 and covered 5.2 ha or c. 2/3 of the entire area of the settlement (Fig. 32). 130 anomalies from burnt houses were identified; the total number of houses can therefore reach 200. Although incomplete, the geophysical plot displays a radial settlement layout with several successive circles of the houses. In the north-eastern part of the site, a large „square" with a larger dwelling can be observed. It is possible that this dwelling had a communal function and is similar to special houses from Petreni and Stolniceni (see below). To the north-east there is a large break in the outer two circles, leading to the „square". Most probable, this break represents an access path. The inner house circle changes its configuration and is somehow deformed constituting the western and south-western limits of the „square". Within the house circles, smaller rows and groups are encountered.
6. *Glavan I* (Drochia district). The geomagnetic prospections performed by V. Dudkin in the 1978-1979 covered the area of the settlement of c. 10 ha entirely. 148 anomalies from archaeological features were identified (Fig. 33). Most of them belong to rectangular dwellings with a length of 10-16 m and width of 4-6 m. There are larger anomalies however, up to 20 m long and 10-15 m wide. Some of them could represent groups of smaller houses located close to each other. Alongside the burnt houses smaller (6-10 m²) oval anomalies are encountered. These can be assigned to pits. Generally, the settlement has the shape of a triangle with rounded corners. The houses from its western part are oriented towards the centre while the houses from the east have a pretty chaotic arrangement. The settlement layout is thus not a very regular one; the features are disposed in rows and smaller groups (Dudkin and Videiko 2009).
7. *Cobani* (Glodeni district). The prospection was made in 2009 with a 5-channel Sensys magnetometer. It revealed three ditches – a double one enclosing 4.5 ha and an inner one enclosing 2.5 ha (Fig. 34: A-B). Besides these earthworks, 24 house anomalies with an average area of 29 m² were detected. Houses display a certain variation in size and orientation. Taking into account this fact and also the presence of several ditches, the existence of more than one settlement phase is very probable (Rassmann *et al.* 2016).
8. *Sîngerei* (Sîngerei district). The prospection was made in 2010 with a large 16-channel Sensys magnetometer. The survey revealed 130 houses of sizes between 20 and 130 m² with an average surface of 48 m² as well as about 160 pits (Fig. 35). A cluster of settlement pits is visible on the southern end of the settlement. The settlement layout is not very clear; on the plan, there are both arch-shaped and linear rows visible. Their orientation varies. In the western part of the settle-

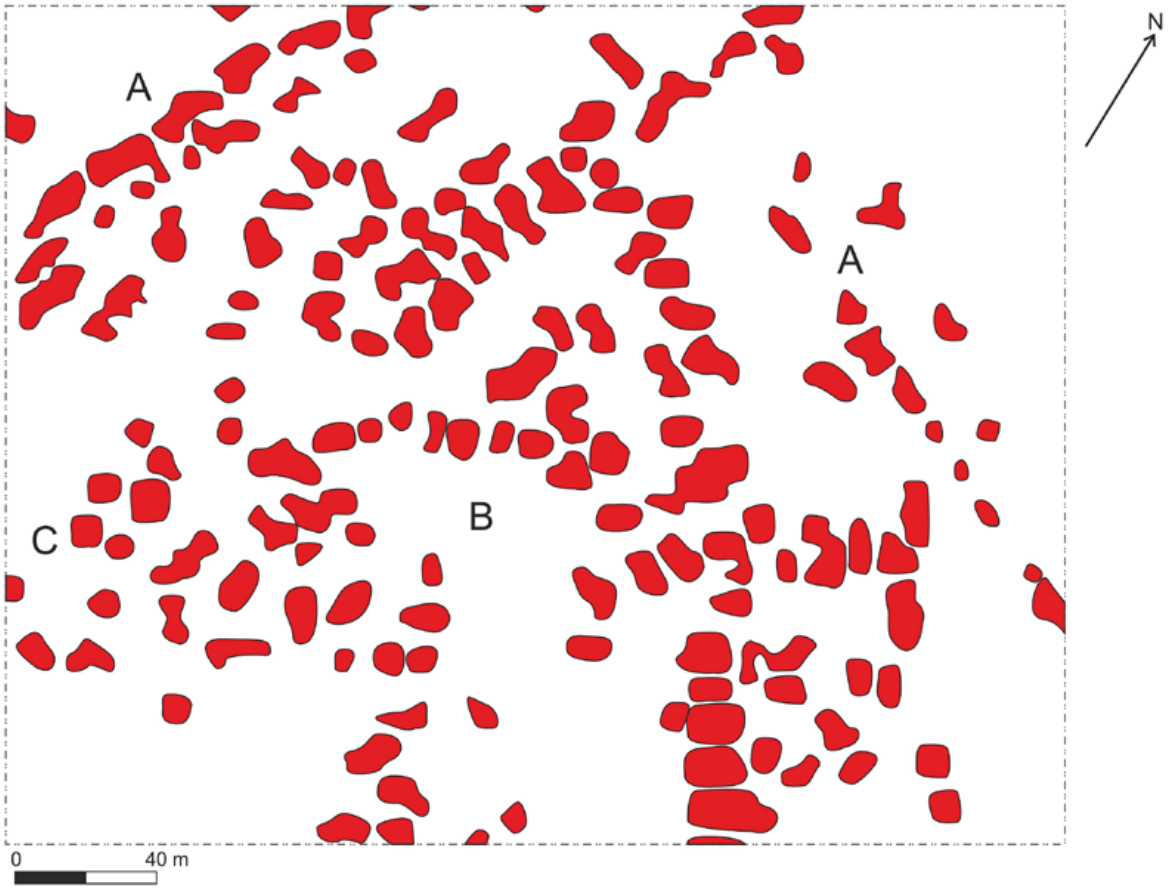

Fig. 29. Ivanovca. Interpretation of the geophysical plan (redrawn after V. Dudkin)

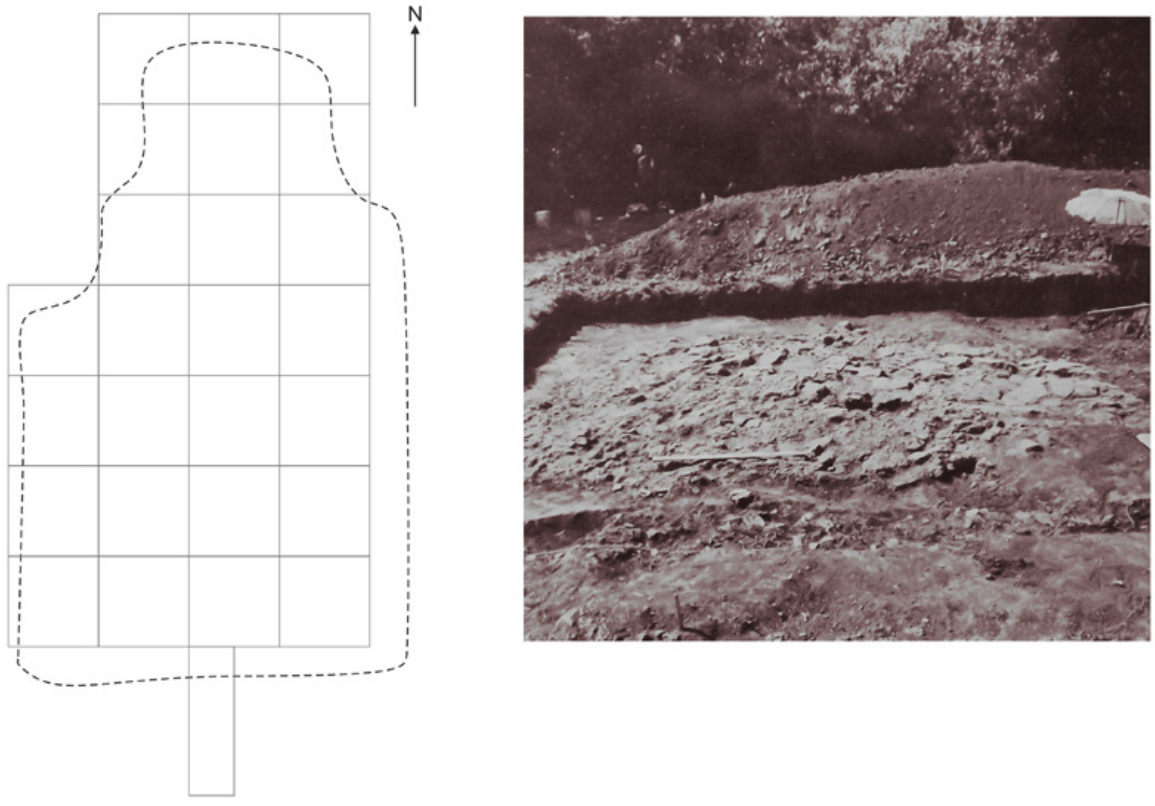

Fig. 30. Racovăț. Left – contours of the burnt house obtained by geomagnetic prospection of G. Zagnii. Right – photo of the remains of the house under excavation (after Черныш 1970)

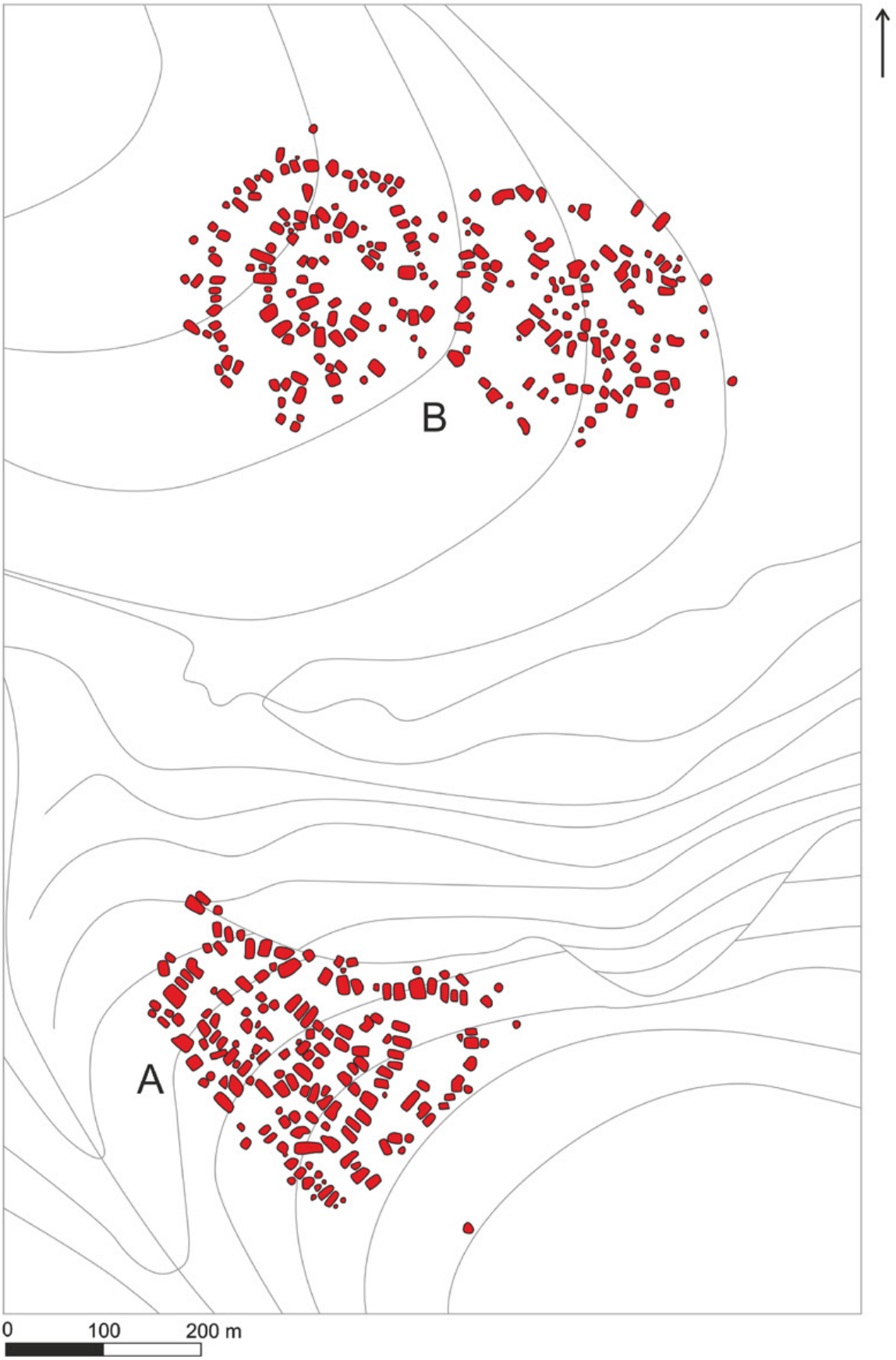

Fig. 31. Sofia la Moină I (down) and II (up). Interpretation of the geophysical plan (redrawn after V. Dudkin)

ment, houses are more regularly arranged. Differences within the spatial layout of the houses could suggest several chronological settlement phases. The size of the settlement is 9 ha with a densely settled area of 5 ha (Rassmann *et al.* 2016).

9. *Petreni I* (Drochia district). The survey was conducted in 2009-2010 first with a 5 and later with a 16-channel Sensys magnetometer. It revealed 457 houses, 8 special buildings, 21 kilns and 320 pits as well as 2 ditches (Fig. 36). The average house size is circa 56 m². The larger houses in Petreni are concentrated in the northern periphery and in the inner circle. 246 houses are oriented radially and 209 are located axially. The 8 special buildings have a mean size of 200 m². Two of them are located in the central area and the rest – outside the inner house circle and in the outer circle. The largest special building is located in the very centre of the site and has a size of nearly 300 m². The 320 pits have various sizes, from 1 to 5 m. Some of them might have been backfilled with settlement refuse and burnt clay. The settlement is enclosed by two ditches; burnt houses lay over the inner ditch which is a sign for several chronological phases in the settlement's development. Outside the ditches some circular anomalies can be observed. Most probably these are the pottery kilns. Several of these are situated inside the settlement as well. Also outside the settlement, at its periphery, some larger weak circular anomalies with a diameter of around 20 m could be observed. They are structurally connected with the site, but their function remains unknown so far (Rassmann *et al.* 2016). Archaeological excavations on the site were conducted at the beginning and in the mid-twentieth century; however, modern investigations using the data from the geomagnetic plot started in 2011 (Uhl 2014; Hansen and Uhl 2016). Until now, a couple of houses (Fig. 37) as well as the inner ditch and some pits have been excavated, yielding interesting results.
10. *Stolniceni I* (Edineț district). The settlement has been partially scanned in 2015 with a 5-channel Sensys magnetometer (Țerna, Rassmann *et al.* 2016). Its size is around 33 ha of which 14 ha in its north-eastern part were prospected (the total surveyed area covered 23 ha). The geophysical plan includes circa 140 burnt houses with a mean size of 68 m² (Fig. 38). Like in Petreni and on other complex Tripolye sites, there are some larger houses with the mean size exceeding 150 m². These are located centrally and are separate from the main house clusters. The settlement layout is a concentric one with slightly elongated radial house rows. Most of the houses are axially oriented, with

Fig. 32. Sofia II – Găvan. Interpretation of the geophysical plan (redrawn after V. Dudkin)

fewer located radially. The inner structure of the site including the "rings" is very well visible on satellite images. It is therefore possible to interpolate the geomagnetic plan with the settlement limits known from satellite imagery. Thus, the total number of houses in the entire settlement should be around 340. For the whole settlement area we can calculate more than 600 pits. The pits vary in size from a diameter of less than 1 m to up to 5 m. Noteworthy are some pits located outside the settlement, to the east. It is very probable that they are contemporary to the site. Several anomalies may be classified as kilns. The most visible ones are located in the north-eastern part of the settlement close to the triple ditch. The width of the ditch anomalies is circa 2 m. Alongside the outer ditch the entrances are visible in some places, aligned with alleys between the houses. Close to the inner ditch a weak linear anomaly indicates a palisade ditch. Outside the settlement and the triple ditch four linear anomalies running to the centre of the settlement, representing paths, are vis-

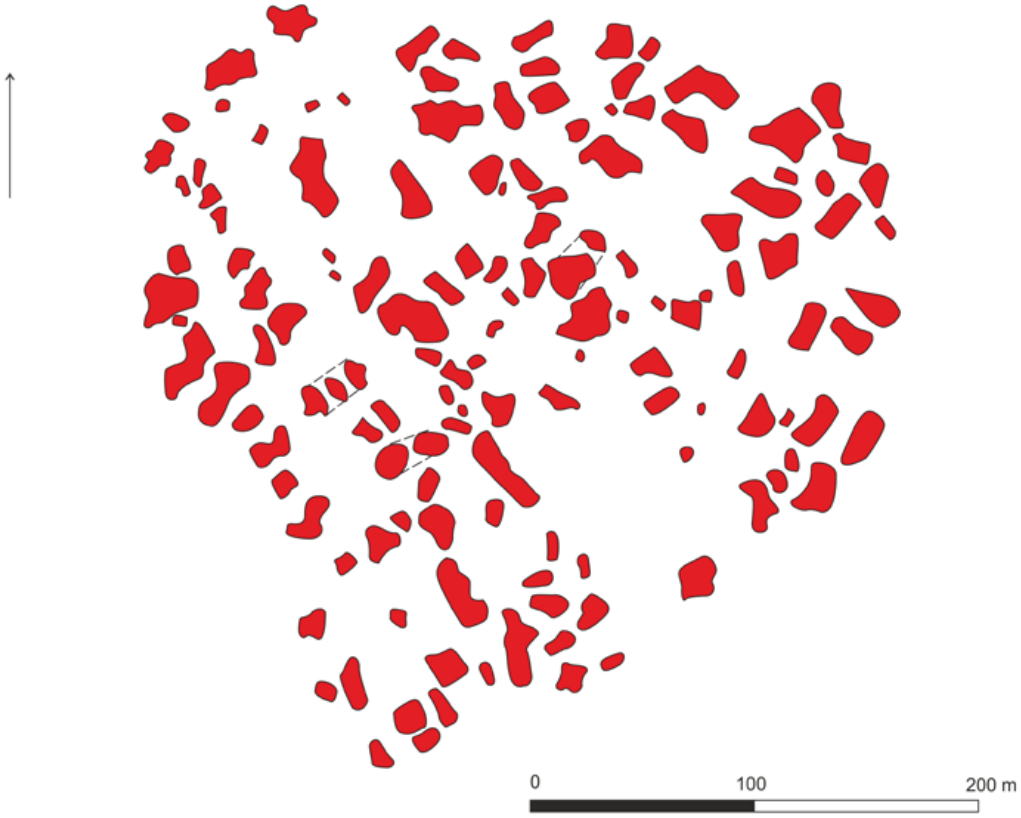

Fig. 33. Glavan I. Interpretation of the geophysical plan (redrawn after V. Dudkin)

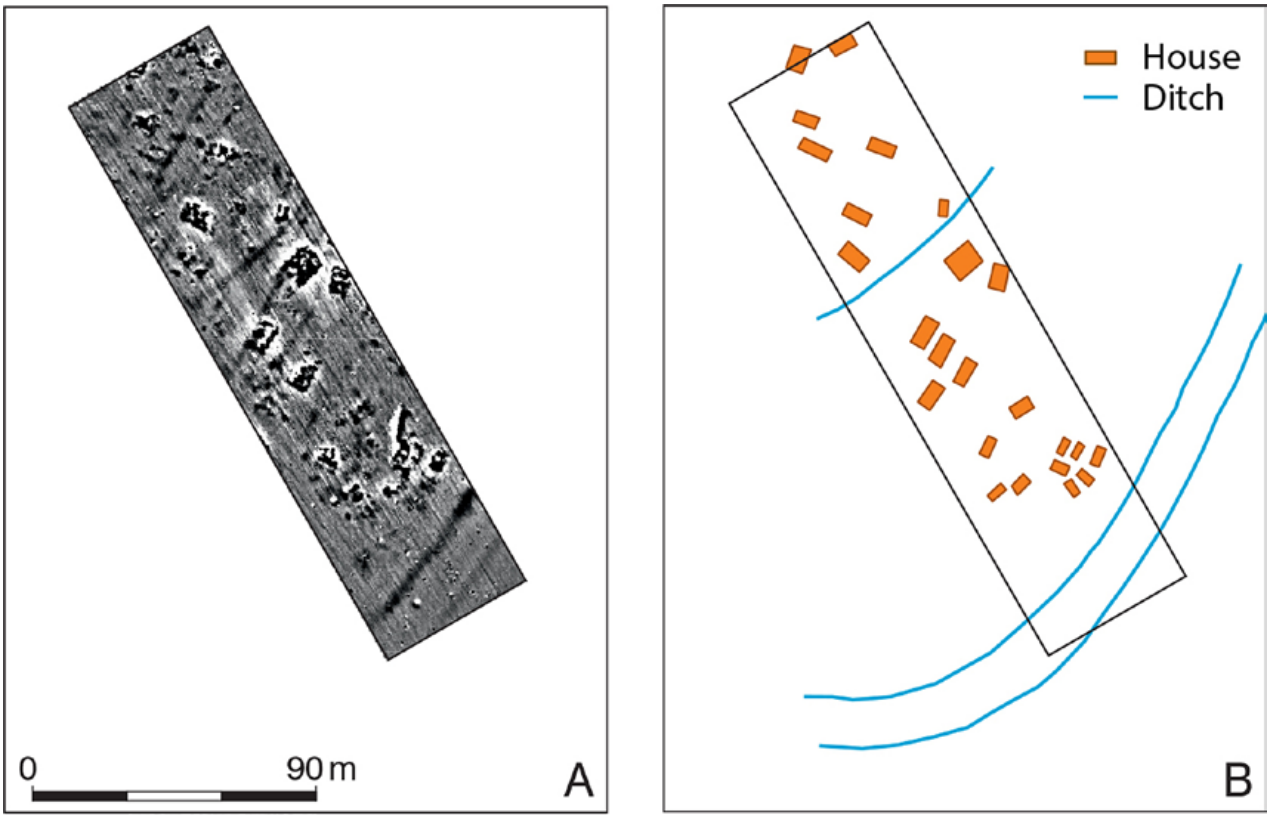

Fig. 34. Cobani. Geophysical plot and its interpretation (after Rassmann *et al.* 2016)

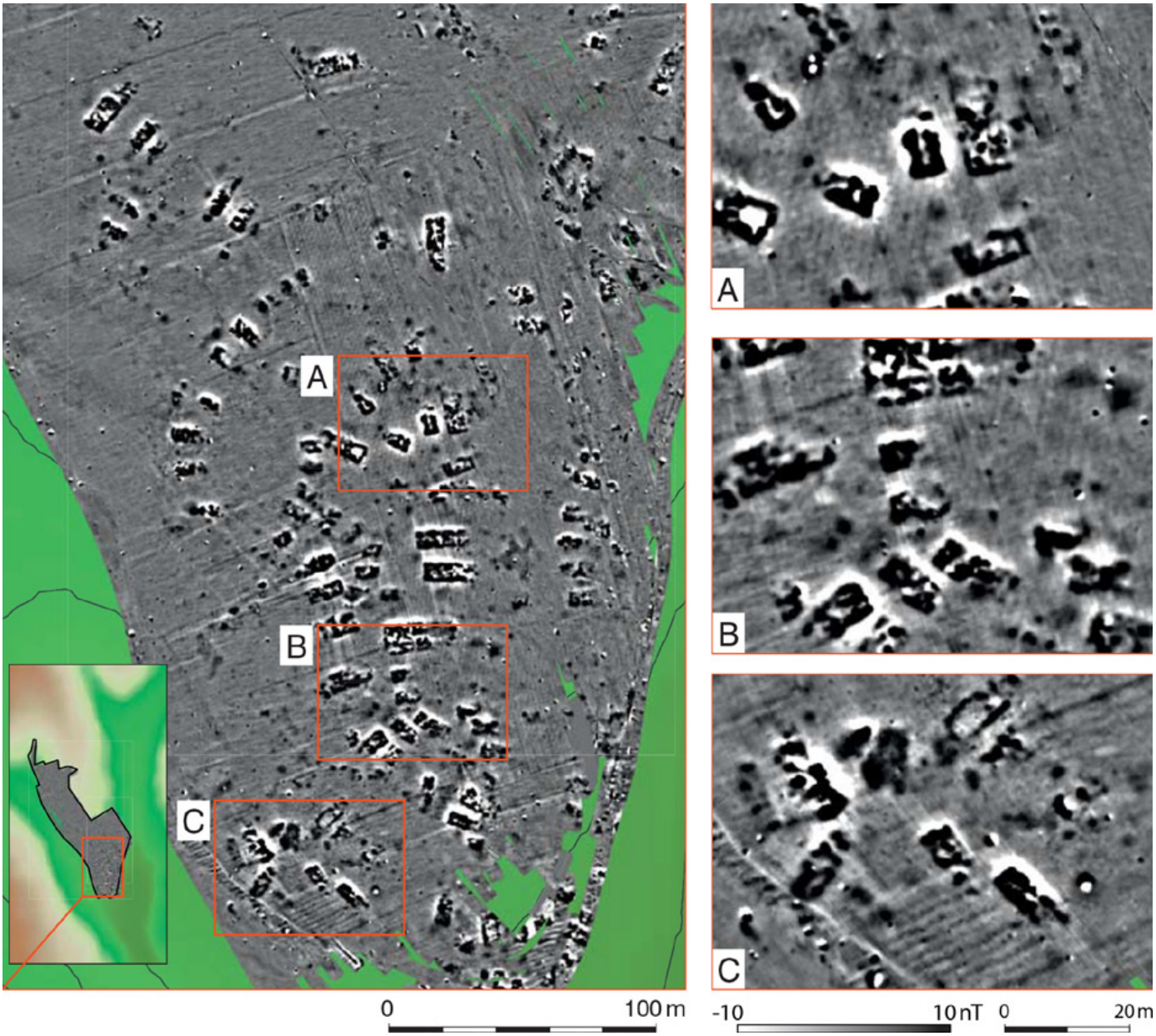

Fig. 35. Sîngerei. Geophysical plot (after Rassmann *et al.* 2016)

ible. In the prospection area circa 15–17 house groups might have existed (Fig. 39). In 2015 a test-trench was placed over one of the pits close to the north-western periphery of the site (Fig. 40). The pit turned out to be very rich in finds, including pottery, stone and bone implements as well as clay miniatures (Fig. 42). The distribution of material and the configuration of the pit backfill show that the pit was left open for some time and then a large amount of material (including restorable vessels) was discarded into it (Fig. 41). Excavations continued in 2016 (unpublished excavations by Țerna and Rassmann, summer 2016), when various types of anomalies from the geomagnetic plan have been investigated, including the triple-ditch system, the palisade, one of the paths and a well preserved pottery kiln.

11. *Trinca – La* Șanț (Edineț district). The settlement was prospected in 2016 by Hofmann and Țerna. The survey revealed its radial structure with some ditches and possible kilns (unpublished prospections by Hofmann and Țerna, spring 2016).

There are several settlement types which are discernible from the data presented above. First one includes complex settlements which have a concentric (circular or oval) layout of house rows and display a number of additional features like pottery kilns, radial paths, ditches and special larger buildings. These are the settlements from Sofia – La Moină II, Sofia II – Găvan, Petreni, Stolniceni and Trinca – La Șanț. In terms of internal layout, the "centre-periphery" model prevails, with spe-

cial buildings located in the settlement's core. This is the further development of a pattern which appeared in the preceding Cucuteni A-B period and reached its apogee in the Bug – Dnieper interfluve from where the "mega-sites" covering several hundreds of ha are known (see Videiko 2013; Müller *et al.* 2016). The Moldavian complex settlements are much smaller than the ones from Ukraine; their size does not exceed 50 ha. The second type is represented by settlements with not so regular layout. Within these sites there are some curvilinear house rows which however do not form clearly visible concentric structures. Here one could include the settlements like Ivanovca, Sofia – La Moină I, Glavan I and Sîngerei. Finally, the third settlement type would be the one from Cobani, located on a high hard-to-reach promontory reinforced by several ditches. Here, the spatial constraint is reflected in the irregular layout of the site as well as the reduced mean house size of just 29 m².

So far the situation of the two sites from Sofia – La Moină I and II is unique. Apparently, the surface material shows that they are synchronous. If this is true, the striking differences between the layouts of the two settlements have to be explained in the future. A repeated prospection of the sites, with a high-resolution magnetometer, is therefore truly necessary.

Tripolye C2 chronological stage of the Cucuteni – Tripolye culture (circa 3500-3000 BC).

For a long time the Tripolye C2 settlements have not been the subject of geomagnetic prospection in Moldova. The first attempt to resolve this situation was made in the spring of 2016, when surveys accompanied by test-excavations were conducted on four sites located in a micro-zone near the village of Cunicea in the middle Dniester basin (investigations of Robert Hofmann and Stanislav Țerna). Since the results of surveys are unpublished and shall be introduced into scientific circuit separately, here I will present just brief information on the results of our fieldwork.

1. Cunicea I (Florești district). The prospection was made in 2016 with an 8-channel Sensys device. This site was of particular interest since earlier fieldwork revealed the existence of a Gordinești-type necropolis associated with dugout features of Vychvatincy type (Topal and Țerna 2010; Țerna 2011; Popovici and Ceban 2014) – quite a rare combination and important for refining the micro-chronology of the Tripolye C2 groups from the Dniester basin. The survey revealed several houses arranged in a row. Three of them were tested by small excavations.

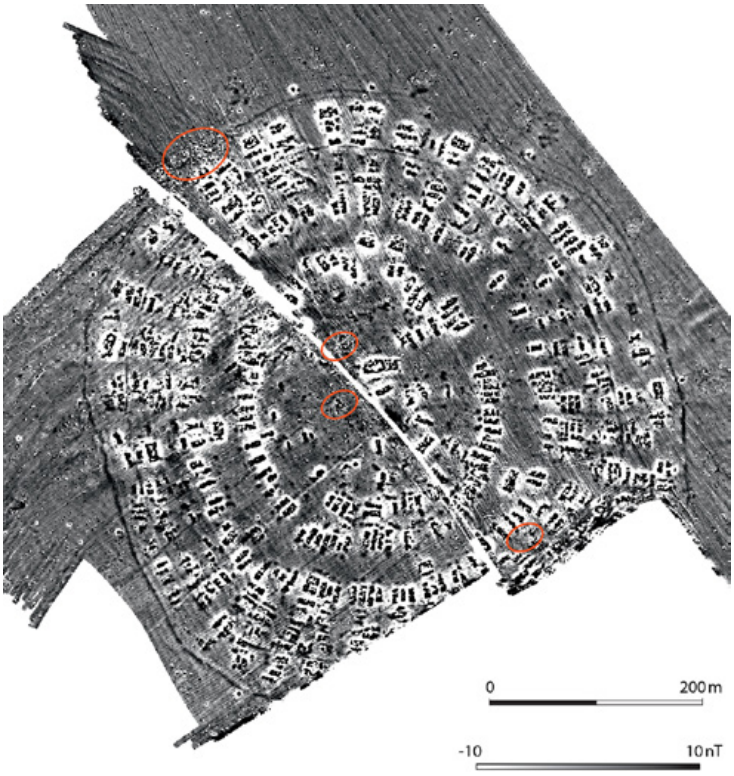

Fig. 36. Petreni I. Geophysical plot (after Rassmann *et al.* 2016). Red ovals mark the probable areas of older excavations.

Fig. 37. Petreni I. Excavations of a burnt house (after Uhl 2014)

2. Cunicea II (Florești district). The prospection was made in 2016 with an 8-channel Sensys device. Unfortunately, the survey didn't yield any clearly visible archaeological anomalies.
3. Cunicea III (Florești district). The prospection was made in 2016 with an 8-channel Sensys device. Over a dozen of houses oriented towards the north-east were revealed by the survey. Their layout is pretty irregular and combines both group and row organization principles. Two test-trenches confirmed the data from the prospection.

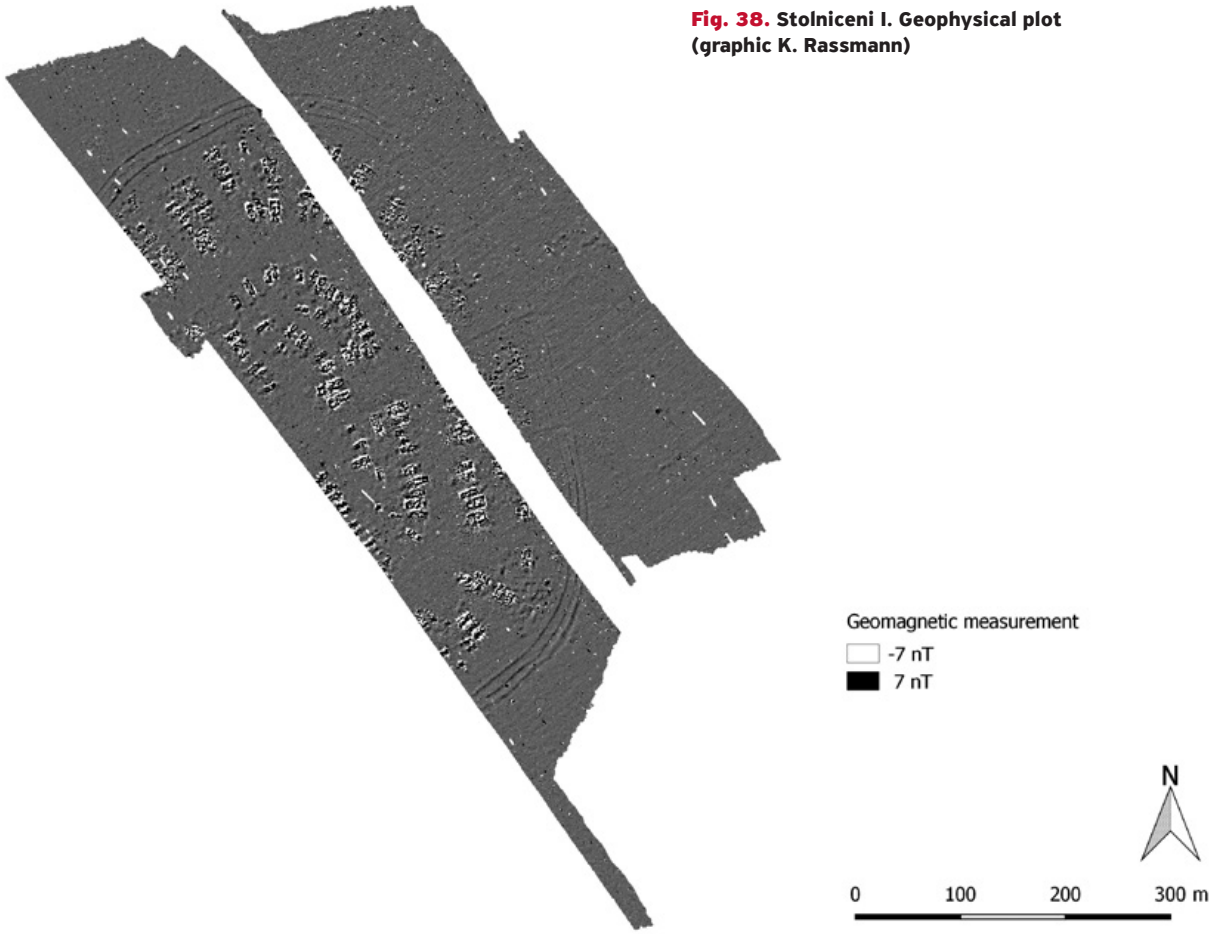

Fig. 38. Stolniceni I. Geophysical plot (graphic K. Rassmann)

Fig. 39. Stolniceni I. Interpretation of the geophysical plot (graphic K. Rassmann and K. Radloff)

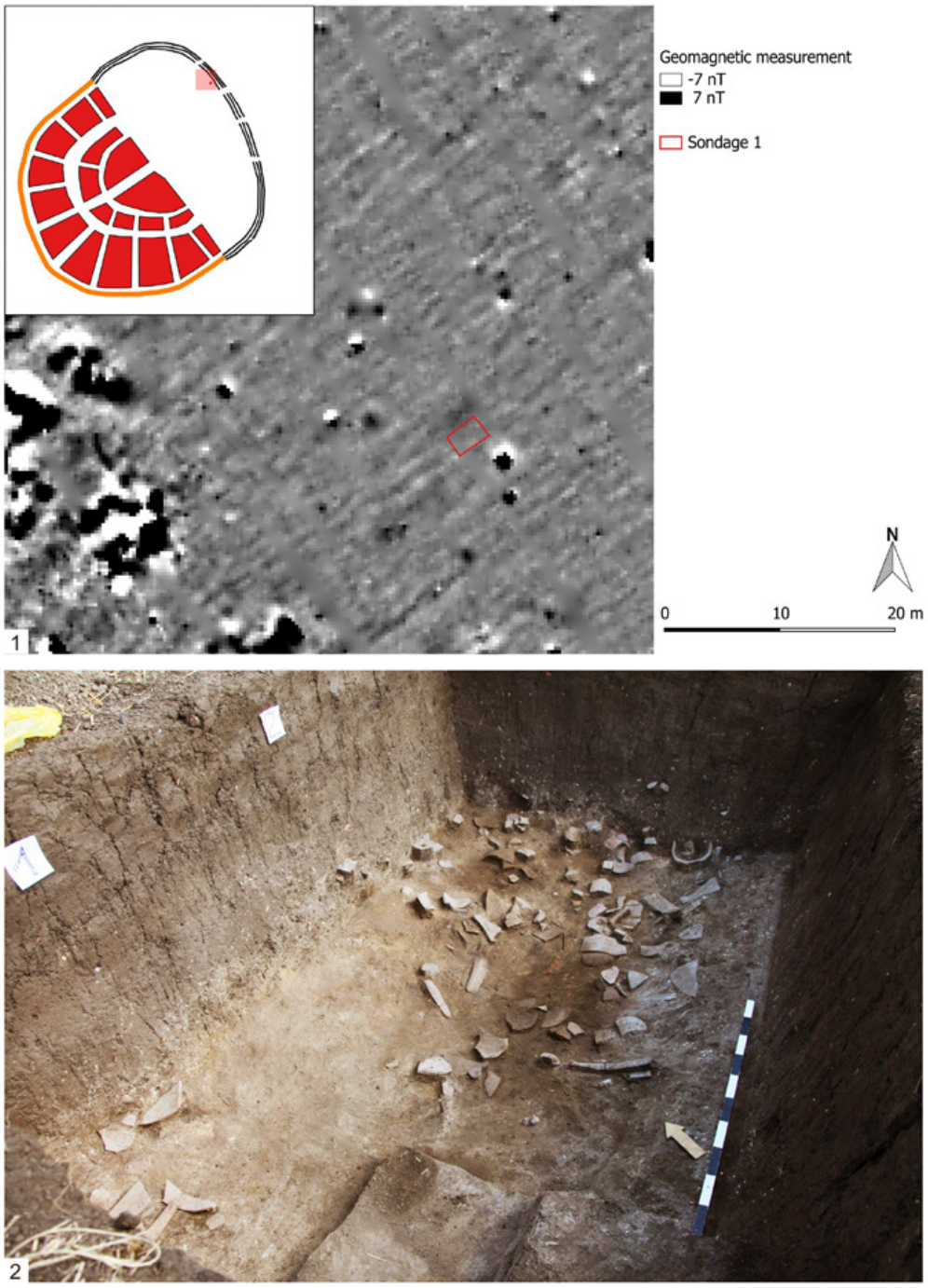

Fig. 40. Stolniceni I. Location of the test-trench (graphic K. Rassmann and K. Radloff, photo by S. Țerna)

4. Cunicea IV (Florești district). The prospection was made in 2016 with an 8-channel Sensys device. Several houses arranged in irregular were encountered here, as well as some pits. Three of the houses are very large with an area of over 200 m². Such dimensions of dwellings are unusual for the Tripolye C2 stage and are recorded for the first time in the Carpathians – the Dniester region. Two test-trenches confirmed the interpretation of the plan, providing material typical for the Chirileni local group of the Tripolye C2 period.

In contrast to the complex concentric layout of many settlements from the preceding Cucuteni B – Tripolye B2, C1 stage, the Tripolye C2 sites display much higher degree of irregularity. Other available settlement plans from the Republic of Moldova which were obtained by means of large-scale excavations (see Marcevici 1981) show the same irregular pattern which seems to be one of the elements accompanying the process of the disintegration of the Cucuteni-Tripolye culture.

▪ Conclusions

Even a brief account of the use of geomagnetic method on the Neolithic and the Copper Age from the Republic of Moldova reveals its enormous potential for archaeological studies. Combined with excavations and modern landscape research, geophysical prospections are capa-

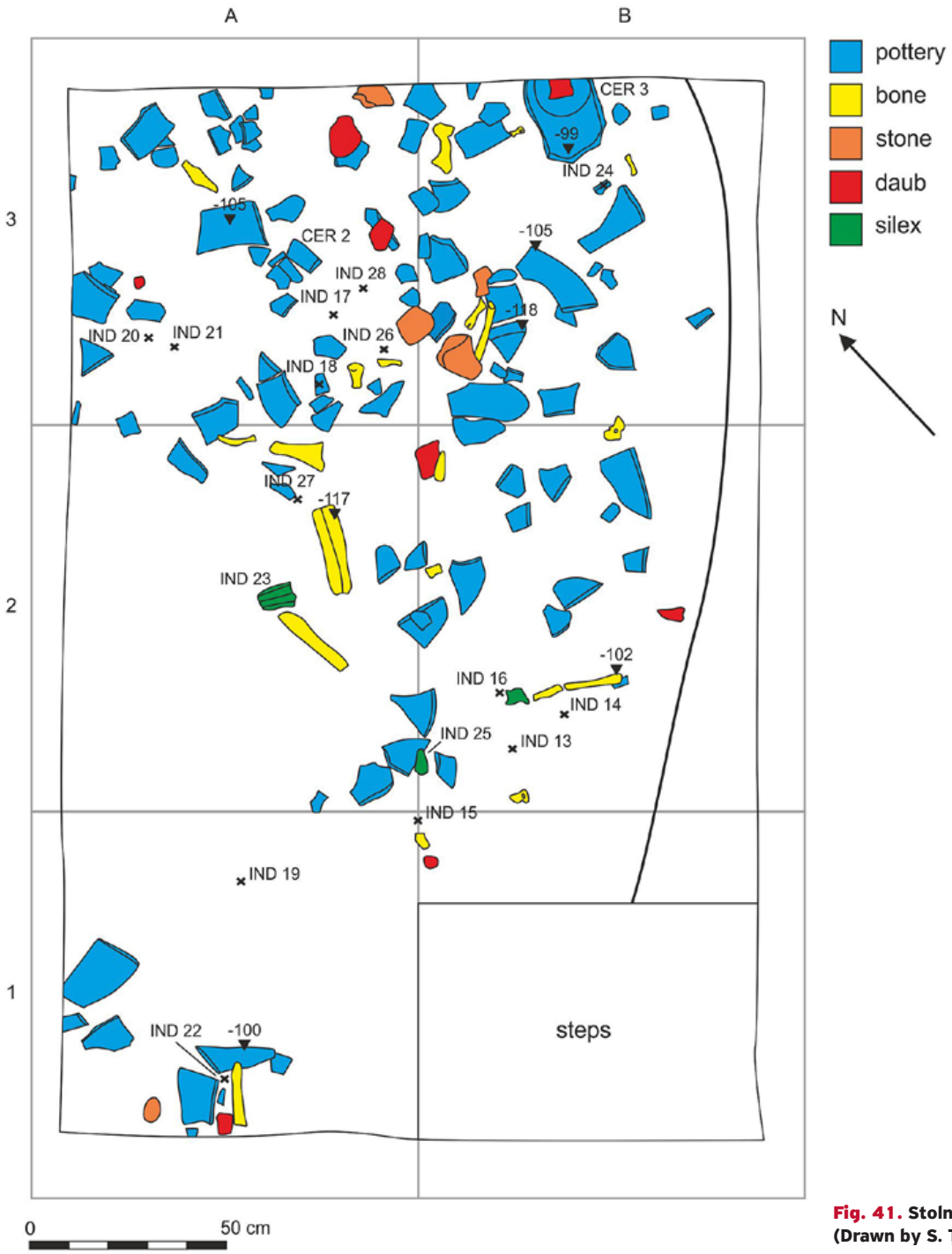

Fig. 41. Stolniceni I. Test-trench (Drawn by S. Țerna)

ble to provide valuable data on the use of land in prehistory, settling strategies, organization of settlements and population growth.

From this point of view, the continuation of geomagnetic surveys is of great interest. There is a lack of settlement plans for certain periods and / or certain regions of the country. Thus, there is a strong need for further prospections on the Starčevo-Criș, Precucuteni – Tripolye A, Cucuteni A-B – Tripolye B1-B2 and Bolgrad-Aldeni settlements as well as for the future intensification of research on the Prut and the Dniester riverbanks or in the far northern and far southern regions of Moldova. Also, further work on the Cucuteni B settlements is quite promising; some of them (as the two sites from Sofia – La Moină) display a unique layout and require a repeated prospection with high-resolution devices.

Another problem is the lack of micro-regional studies. Two attempts were made in recent years – the first to investigate the Neolithic settlements in the Ciulucul Mare and Ciulucul Mijlociu river basins (both are the tributaries of the Răut) and the second to study the Tripolye C2 sites in the Cunica micro-region (located around the Cușmirca river which is a tributary of the Dniester). This work has to be continued. Also, there is a need for a micro-zonal approach in the Prut basin; here, the Stolniceni zone would be of special interest

Fig. 42. **Stolniceni I. Materials from the test-trench (Photo by S. Țerna)**

since it is close to Romanian Cucuteni A-B sites which, most probably, are the ones behind the beginning of the rise of complexity within the Cucuteni-Tripolye culture, resulting in the appearance of the striking "mega-sites" in Ukraine.

Modern magnetometers, especially when they are coupled with a GPS-device, have a very high operational speed and allow the specialists to obtain a complete settlement plan in several days. Thus, several settlement layouts can be revealed within a single campaign. Accompanied by small-scale excavations and GIS-based analysis of the surrounding landscape, such prospections are able to provide various and valuable results with less investment of time and resources. There is therefore hope that in the nearest future the number of geophysical surveys in the Republic of Moldova will increase and bring new knowledge about the Neolithic and the Copper Age societies from the South-east European prehistory.

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