

Geomagnetic Surveys in the Territory of Labrys (Semibratnee Townsite) in 2006-2008

Tatiana N. Smekalova

During the period of occupation of Labris (Semibratnee fortified site) from the fifth century BC to the first century AD, the bed of the Kuban river ran far to the south of its present-day location so that the settlement adjoined the river. In the half-*verst* map of the late 19th century, the site is located at the boundary between arable fields and the bogged lowland (Fig. 1). In addition, a small lake called Liman Raznokol, now non-existent, is specified on the map to the southwest of the site – probably the remains of the former riverbed. It is interesting that the *liman* has dwindled, as shown by reconnoitring of the same map in 1930 (cf. Fig. 2).

In the archive air photographs of 1959, the light outlines of the site are clearly distinguishable in the form of a keyhole (Fig. 3). The northern section is oval, with the longer axis stretched along the river, whilst the southern one is rectangular, almost a square. Possibly, the lighter broad band outlining the settlement's area corresponds to its external defensive wall of limestone. As a result of repeated ploughing, the material of the wall gradually degraded and crumbled, so forming a broad diffuse band interrupted only where the gates were located and, vice versa, thickening in the areas of the towers. The fortification elements are best discernible in the southern rectangular part of the site. Here, it seems, we may locate the southern, eastern and western gates which were defended by towers. Indeed, during their decipherment of the aerial photo, Yu.V. Gorlov and Yu.A. Lopanov identified only a single southern gate, which in their opinion was protected by a *proteichisma* in addition to the tower (Gorlov & Lopanov 1999, 172).

Additional information on the defensive system of the settlement, as well as on its internal structures, may be gained from the data yielded by the magnetic surveys of 2006-2008. In 2006 the author conducted surveys in the elevated area surrounding the excavations.¹ Later, the area of the magnetic survey was extended over the entire southern section of the site (in 2007 and 2008) (Fig. 4). In 2006, the German geophysical group attempted to carry out magnetic surveys using a multi-sensor system moved by means of a wheeled mechanism. However, due to the high quantity of large stones, particularly in the southern elevated area of the site, and because of the deep ploughing of that area, they succeeded in investigating only a band about 70m wide and about 160m long where the surface of the site is smoothest in the direction of

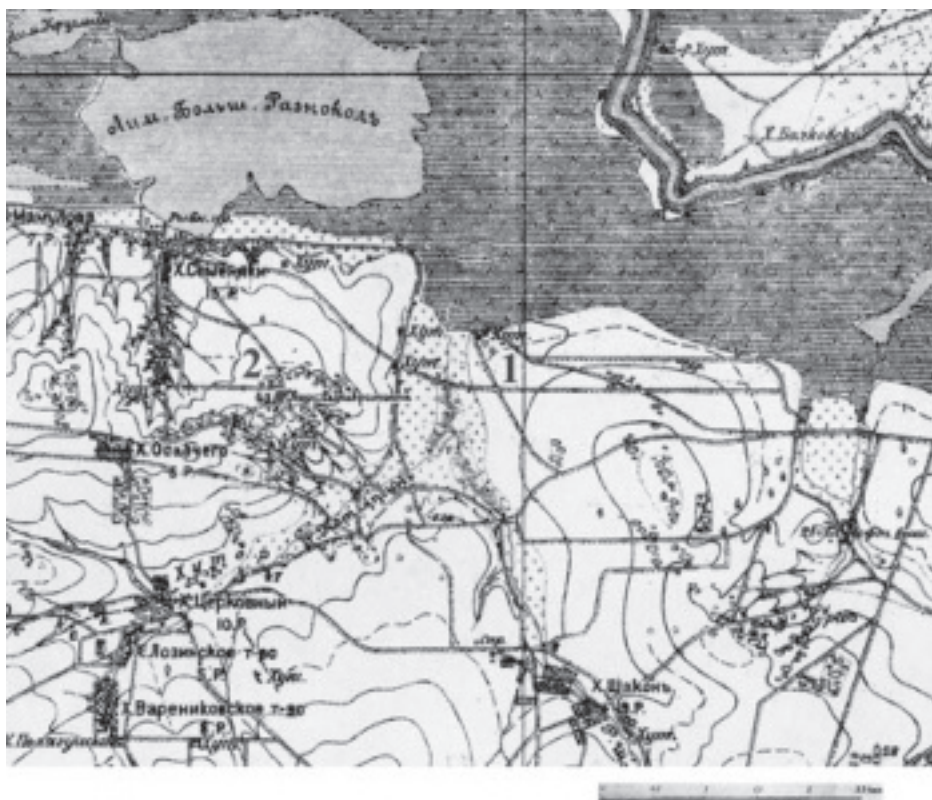


Fig. 1. Map of 1909-1910 at half-verst scale (1:21000) from the Joint Staff of the Red Army, showing surroundings of the Semibratnee townsite (1) and Semibratnee kurgans (2).

the tilling. The area surveyed by the German group is marked by a dotted line on Fig. 4. The results of these surveys have not yet been published. In 2007, the German geophysicists were not able to record any measurements in the deeply ploughed site because it was impossible to move the trolley with the sensors across the field.

Indeed, the conditions for magnetic surveys at this site are fairly complicated. Therefore, we had to abandon the highly productive multi-sensor system fixed on a two-wheeled cart, which is usually employed in fields, and to conduct instead sensing by means of runs with a single transportable sensor; a Canadian GSM-19WG Overhauser magnetometer. Another magnetometer of the same type was mounted in the zone of the “normal” field in order to take control-point measurements. These reference data were afterwards used for subtraction of the temporary variations in the earth’s magnetic field from the spatial measurements. At the site, a coordinate grid was fixed. Initially it was oriented to the cardinal points (in 2006), but afterwards was redirected



Fig. 2. Reconnaissance of 1930 of the 1909-1910 map in the region of the Semibratnee townsite (1) and Semibratnee kurgans (2).

along the boundary of the forest belt in order to cover the maximum area of the site (in 2007-2008). The measurements were taken at intervals of 0.5m between the lines and of 0.25-0.3m along the lines. The elevation of the sensor was maintained at 0.3m above the surface.

On the magnetic map obtained, a clear and fairly intensive anomaly (on average 40 nT) is distinguished in the form of three sides of a trapezium surrounding the entire section of the site (Fig. 4). The width of the base of this "trapezium" is about 198m, the lengths of the lateral sides are approximately 100-130m and the angle formed by the lateral sides to the southern one is about 77°. The source of this anomaly is evidently the highly magnetic fill of the ditch surrounding the southern part of the townsite. Particularly notable



Fig. 3. Aerial photograph of 1959 showing the Semibratnee townsite.

are three areas of thickening with corresponding increases of intensity of the anomaly. These three areas, *viz.* the southern, eastern and western, may have been three gates defended by towers.

When comparing the magnetic map with the results of the decipherment of the aerial photo it is particularly striking that the defensive wall around the southern part of the townsite, which in the aerial photo looks almost square, is surrounded by a ditch of a strange trapezoid shape. Possibly, this inconsistency between the forms of the defensive wall and the ditch can be explained by the presence of two corner towers in the southern area of the defensive

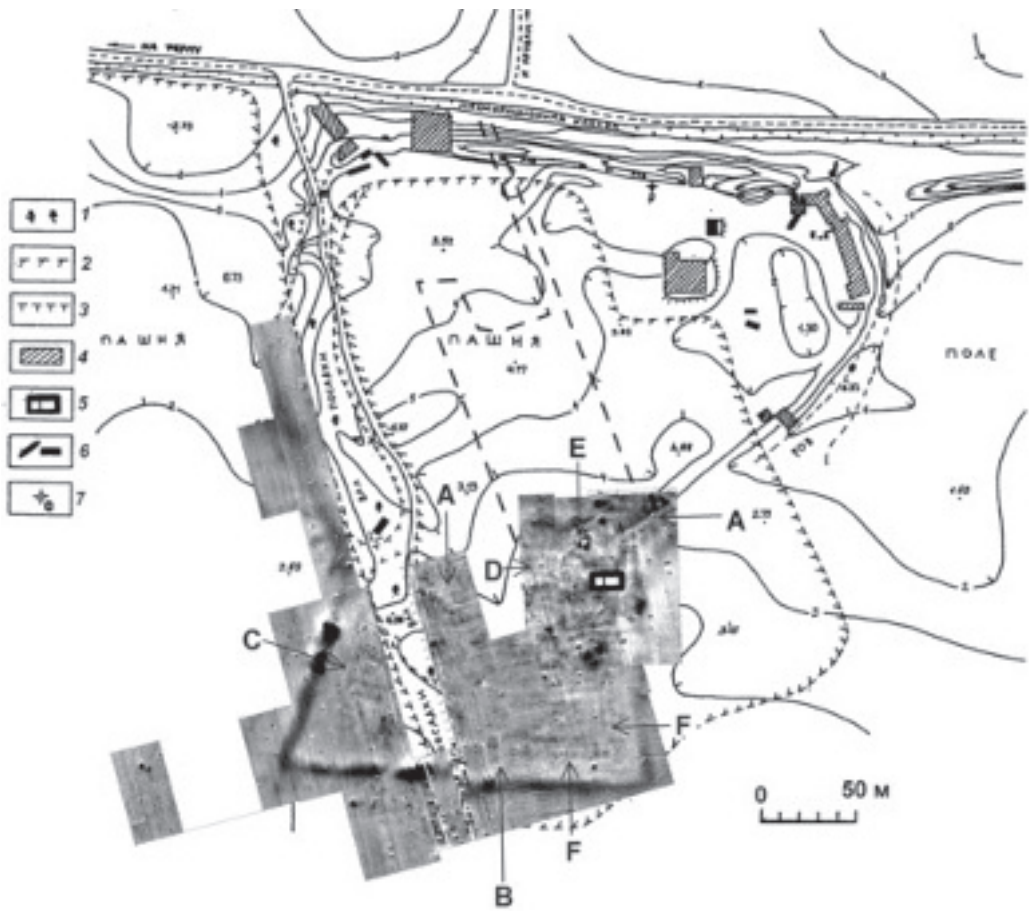


Fig. 4. Magnetic map of the townsite from the surveys of 2006-2008 and results of its interpretation. A – sectional structure of magnetic anomalies in the area of the defensive walls; B – stone building consisting of two rooms; C – large rectangular structure opposite the western gate; D – monumental stone rectangular structure; E – metal workshop. The dotted line shows the area of the magnetic surveys conducted by the German geophysical group in 2006. Used as the background is the topographic plan of the townsite (S.G. Popov 2001, Bosphorus Expedition of the Institute of Material Culture, St Petersburg). Notations in the topographic plan: 1 – forest plantation; 2 – arable field; 3 – irrigation canal; 4 – excavations of 1938-1955; 5 – excavations of 2001-2006; 6 – robber excavations; 7 – topographic reference points.

wall which are outflanked by the ditch by a fairly considerable distance. In this case, it seems, we should rely more on the data of the geomagnetic surveys since they reflect more precisely the real situation. Future excavations may confirm or define more exactly this hypothesis.

The high intensity of the magnetic anomaly of the hypothetical ditch is possibly explained by its strong magnetic fill, which was formed by wooden

features, burnt in a fire, collapsing down into the surrounding ditch. Probably, at some stage during the occupation of the site, a bank was constructed beyond the ditch and walls were erected over it. The walls were constructed not of stone but of wattle and twigs with an earth fill between. In the event of a fire, walls of this kind can gain extremely strong magnetization, and this possibly explains our anomaly. The most intensive burning was probably in the areas of the towers, where the bulk of the wooden structures may have been. In any case, the magnetic anomalies are markedly strengthened where the hypothetical towers were positioned in the middle of the southern, eastern and, to a lesser extent, the western sides. The anomalies here have the form of double peaks and in the centre there is possibly a passage to the gate over the ditch. Near the southern gate, a fairly large stone structure consisting of two rooms is discernible (marked by the letter "B" on Fig. 4).

It is of special note that in the area of the presumed defensive wall some anomalies with a sectional structure are clearly discernible on the magnetic map. These consist of two parallel negative anomalies running 5-6m apart with internal bridges every 6-7m. The chains of these sections stretching along the presumed wall are excellently "readable", both in the oval northern and rectangular southern areas of the townsite (marked by arrows with the letter "A" on Fig. 4). Evidently, excavations are necessary in order to elucidate particular structural details of the settlement's fortification.

Regrettably, in the 1970s a forest shelter-belt was laid throughout the western part of the townsite. The southern gate, towers and the ditch, it seems, were disturbed in the process. On the magnetic map, the positive anomaly related to the ditch almost vanishes within the forest belt, suggesting that the ditch was destroyed by the deep trenching. Furthermore, forest planting has considerably distorted the situation in the southern part of the townsite – in the area where a large rectangular structure (marked by the letter "C" on Fig. 4) was identified on the magnetic map opposite the western gate. This structure seems to have had an important role in the life of the town. It is not without reason that the well-known inscription mentioning the name of the town was uncovered not far from this place, where, in addition, excellently worked stone blocks and even architectural elements come from.

In the most elevated area of the townsite, immediately to the west of Excavation I and marked with a black rectangle on Fig. 4, a monumental stone structure (approximately 15m wide and over 20m long) has been identified on the basis of negative anomalies on the magnetic map (marked by the letter "D" on Fig. 4). There is another interesting stone building to the north of the excavation. Inside it, some strongly magnetic objects – probably kilns and other remains of a "high-temperature" production process – have been noted. In the magnetic field this building is reflected in the form of intensive positive anomalies (marked with the letter "E" on Fig. 4). Possibly we are dealing with a metal workshop here, although the close proximity of the temenos is somewhat surprising. There is also a large building, consisting of a rectangular

yard surrounded by two rows of rooms, at the most southern part of the site (marked with the letter "F" on Fig. 4).

It is impossible to pass over the problem of the pitiful state of the site under consideration. Annually its territory is subjected to deep ploughing, after which an army of local "amateur antiquaries" appears in the field with metal detectors, so exhausting all the metal artefacts, especially the coins, from the cultural deposits.

To conclude, we must note the extraordinary promise of the continuation of magnetic surveys at this townsite. By these studies, we not only gain knowledge of its complicated defensive system but also of its internal layout. Magnetic maps of the site could yield reliable data for establishing the boundaries of the protection zone necessary to safeguard this significant archaeological monument.

Note

- 1 The author offers her sincere thanks to all the participants of the Bosporan Expedition, and particularly to its director, Vladimir A. Goroncharovskii, and to A.Ju. Eliseev, Research Assistant of the Museum of History, St Petersburg University, for the excellent organization of the field studies and their help in carrying out the magnetic surveys.

Bibliography

- Gorlov, Ju.V. & Ju.A. Lopanov 1999. Opyt predvaritel'noj dešifrovki aerofotosnimkov Semibratnego gorodišča, *Problemy istorii, filologii i kul'tury* 8, 172-174.
- Smekalova T.N. & V.A. Gorončarovskij 2007. Magnitnaja razvedka Semibratnego gorodišča v avguste 2006 g, *Bosporskie čtenija* 8, 286-292.
- Smekalova T.N., V.A. Gorončarovskij & Ju.L. Dyukov 2007. Magnitometričeskoe issledovanie Semibratnego gorodišča i monety sindov, in: *The IVth All-Russian Numismatic Conference. Tezisy dokladov i soobščeniij*. St Petersburg, 34-36.

