

**METAL WORKING IN THE GETIC CITY
IN "SBORYANOVO" LOCALITY NEAR ISPERIH,
NE BULGARIA
(PRELIMINARY REPORT)**

T. STOYANOV – ZH. MIHAYLOVA

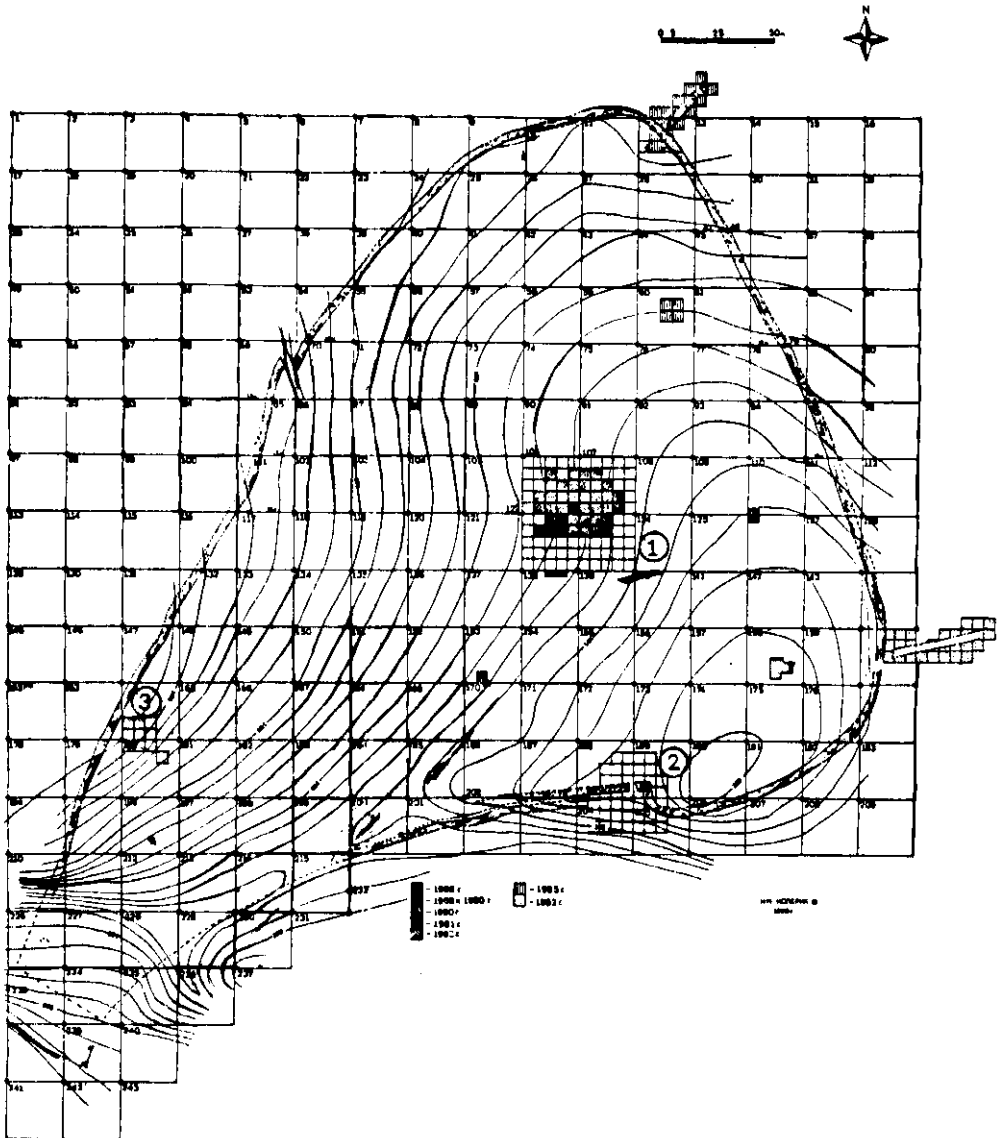
The discovery of the magnificent tomb in "Ginina Mogila" Tumulus near the village of Sveshtari in 1982¹ meant the start of archaeological studies of large dimensions in the entire complex of prehistoric, antique and medieval sites in "Sboryanovo" locality. The latter is situated between Sveshtari and Maluj Porovets near Ispereh. The Thracian settlement located on the plateau at "Dimitrovo" Water Supplying Station is amongst the important sites that have been studied in the years following 1982. According to expectations the settlement has turned out to be associated with the enormous tumular necropolis stretched over both the banks of the Krapinets river. Considerable data has been provided in the course of the past nine archaeological campaigns (1986–1995). The results now obtained allow to outline the city territory, fortification system, stratigraphy and chronology².

Although the settlement originated on a naturally fortified place it was additionally defended by a reliable fortress wall of thickness between 3,5 and 4,2 m. The main part of the wall surrounded a territory of about 90 decare while total fortified territory including the terrain enveloped by the supplementary barrage walls (diatheichismas?) exceeded 110 decare (Pl. 1)³. The information got from various diggings and trenches as well as from the foundations of "Dimitrovo" Station allow the suggestion that all the fortified territory was relatively densely occupied by dwelling farm buildings and constructions, as well as by communication thoroughfares, the latter being subjected to a certain orientation system. Stratigraphic data together with the dating finds, mainly

¹ Al. Fol, M. Chichikova, T. Ivanov, T. Teofilov, *The Thracian Tomb near the village of Sveshtari*, Sofia, 1986.

² The data obtained in the recent years has been summarised in : T. Stoyanov, *The Thracian City-Centre in Sboryanovo, an Attempt at Characteristics*, in *Helis* III. 2, Sofia (in print); T. Stoyanov, J. Mihailova, *La cite thrace a Sboryanovo d'après les recherches archéologiques récentes*, in *VIII-èmes semaines Philippopolitaines de la histoire et culture thrace*, Plovdiv, 1994.

³ *Ibidem*, Fig. 1.



Plan 1: Plan of the Thracian city in Sboryanovo
 1, 2, 3 – spots with attested data related to metal working
 1 - Central excavation
 2 - The southern gate
 3 - Sector 164, the western fortification wall

coins, black polished vessels and amphorae stamps provide the opportunity for the time being to distinguish two building periods following immediately one after the other since the forties of the 4th till about the middle of the 3rd c. B. C.⁴. The quantity of imported goods and especially the number of the unearthen amphorae stamps testify to the impressive consumption (and distribution?) potentialities of the settlement. Therefore the localisation here of an Early Hellenistic Thracian city – the seat of a mighty Getic dynasty⁵ whose representatives were buried in the tombs and graves studied in the Eastern necropolis⁶ is now far beyond any doubt. The data available gives grounds to identify the site as Helis, the capital of Dromichaetes⁷.

More than 300 intact or fragmented artefacts related to metallurgy, metal working as well as other crafts have been documented in the course of the past investigations. Pieces of slag have also been found in the central excavation and some other trenches.

Completing the various groups of tools and implements and especially the research of a distracted furnace in the central excavation in 1990–1991 have definitely eliminated the hesitation concerning the existence in the settlement of metal working and other workshops. The aim of the present paper is to give currency to some data unambiguously proving that the Thracian city was also a considerable production centre.

The stuff, waste and the products themselves indicate the production in the city workshops of articles of iron, non-ferrous and precious metals like copper, bronze, lead, silver and gold. The artefacts found and the data obtained are sufficient to picture although roughly the entire chain of interdependent and successive production operations, from metal extraction or refinement, through casting and forging to the lapping and decoration applying different techniques of thermal and cold processing.

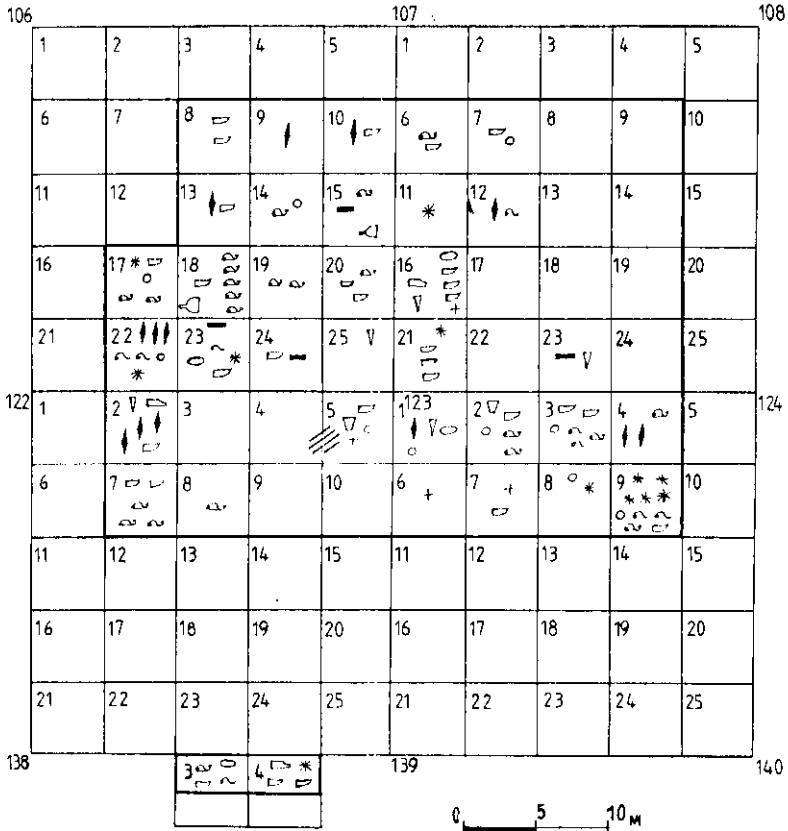
Undoubtedly the melting furnaces and the blacksmith's (respectively) furnaces and hearths stood at the very beginning of the technological range. The furnace remains have been found in Square 122/4–5 in the Central Excavation (Plan 2). It was constructed into an elliptical pit, cut or just formed into the soft bed rock (Fig. 1). Its orifice was 3,5 m long and about 1,6 m wide, and the depth reached 0,5–0,6 m. The slag pieces (the diameter of one of them reached 0,3 m) and large fragments of clay walls with concave inner surface turned into bricks accumulated over the slanting eastern wall of the pit have provided the evidence of the hearth's existence (Fig. 2). The specific appearance of the hearth could hardly be determined because of its almost total destruction and the lack of many certain examples of similar constructions. The link with the

⁴ *Ibidem*; Cf. M. Chichicova, P. Delev, A. Bozhkova. *Investigations of the Thracian Fortified Settlement near Sveshtari in the 1986–1988 period*, in *Helis*, II, Sofia, 1992, p. 73–88.

⁵ P. Delev, *Trakiyskiyat grad pri Sveshtari – edna vuzmozhnost za istoricheska identifikatsiya*, in *Terra Antiqua Balcanica*, IV, 1990, p. 97–115; K. Dimitrov, *Durzhavata na trakiyskata „Sveshtarska“ dinastiya i neinite kontakti prez rannoelinisticheskata epoha*, in *Istoricheski Pregled*, Sofia, 12, 1987, p. 17–29.

⁶ Al. Fol, M. Chichikova, T. Ivanov, T. Tcofilov, *op. cit.*; D. Gergova, *Deset godini v „Sboryanovo“*, in *Helis*, I, Sofia, 1992, p. 9–20, idem *Elinisticheskite nekropoli na Sboryanovo*, in *Helis*, III, 2, Sofia (in print); G. Feher, *Mogiln. nahodki ot Mumdzhilat*, in *Izvestiya na Bulgarskiy Arheologicheski Institut*, Sofia, VIII, 1934, p. 100–114.

⁷ T. Stoyanov, *op. cit.*; P. Delev, *op.cit.* Without being acquainted with the data about the discussed Getic centre, H. Lund has advanced arguments about the localization of Helis in Sboryanovo.



- | | |
|----------------------------------|-------------------------|
| ○ - ingot (gold, silver, bronze) | * - applique |
| ▽ - crucibles | ∩ - knives and scissors |
| ⊖ - small hammer | ∩ - fibulae (intact) |
| — - files | ∩ - fibulae (fragments) |
| ∇ - chisels | ⬇ - awls |
| + - other tools | ○ - ornaments |
| ⊔ - rake | //// - furnace ruins |

- | | |
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Plan 2: Artefacts related to metal working dislocation.

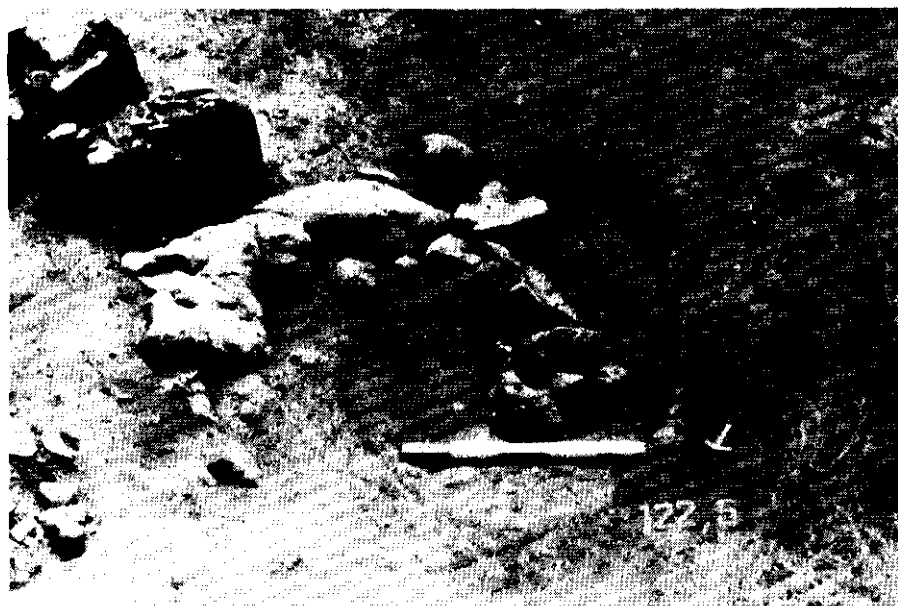


Fig. 1 a, b Destruction of a furnace in the Central Excavation.



Fig. 2 A fragment of the furnace wall.

pit convenient by its shape and dimensions allows to draw a parallel with some bronze foundry furnaces with such pits in Archaic and Classical Greece⁸. The relatively small diameter that could be reconstructed judging by the pieces of the wall (to 0,6–0,6 m) as well as the lack of reliable data about coal and slag in the pit filling suggest yet another possible interpretation: that might have been a shaft-type furnace with a crucible above⁹. This has been supported by the presence of accumulations and individual pieces of slag found mainly to the north, north-east and east of the pit (Square 122/5) in the layer lying above the bed rock (up to 0,2 m in height). Namely in that square and in the neighbouring ones we have unearthed a considerable number of objects associated with the metal working (cf. Plan 2).

Some of the clay hearths documented in the two building levels of the Central Excavation, at the destructed buildings immediately to the north-east of the Southern Gate and at the premises in Sector 164 near the Western fortification wall should be associated with metal working too (cf. Plan 1). This is the

⁸ G. Zimmer, *Griechische Bronzegusswerkstätten*, Mainz am Rhein, 1990, S. 27, Abb. 3–4. For Furnaces making use of the natural terrain inclination (however for casting iron) cf.: L. Roşu, *Archaeological evidence regarding the beginning of iron metallurgy in the world of the Geta-Dacians*, in *International Thracian Conference "The bronze Age in the Thracian Lands and beyond"*, Boston, 7–10 June 1984, Milano, 1986, p. 287–298.

⁹ R. Pleiner, *Iron Working in Ancient Greece*, Praha, 1969, p. 19, fig. 8. For copper or bronze melting furnaces in Messambria Pontica dated to the 5th c BC cf. L. Ognenova. *Nouvelles données sur les artisanats en Thrace dans l'Antiquité. Vestiges d'ateliers métallurgiques du V-e siècle av. n. ère à Mesambria*, in *Acta conventus XI "Eirene"*, Varşovia, 1968 (1974), p. 485–492.

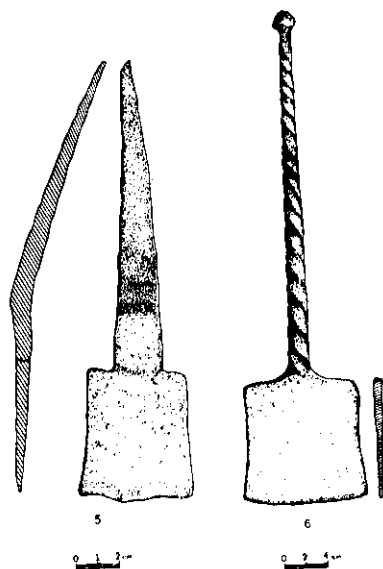
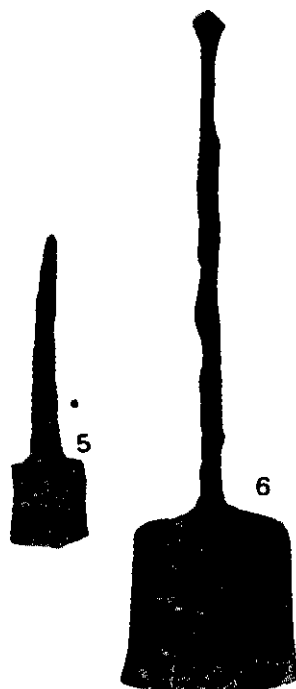


Fig. 3 Iron rakes.



Drawing 1: Iron rakes.

most probable interpretation about those hearths situated out of the building remains. The two massive iron rakes (Cat. Nos. 5–6) (Fig. 3, Drawing 1) indicate such a function. Undoubtedly they were used for scraping carbon deposit, raking up dross, stirring up the charcoals and the bigger one also for filling up the coals¹⁰. As it is well known from the publications since the first steps of metallurgy until the industrial revolution the charcoal had been the main fuel used in furnaces and in the blacksmith's and jeweler's hearths¹¹.

With this respect the plenty of oak forests served as inexhaustible source for obtaining qualitative charcoal¹². The connection of the rake (Cat. No. 5) with a hearth is evident as it has been found in Square 106/15 right above a thickly plastered up with mud fireplace that has acquired an even light brown colour – the sequence of intensive and even firing¹³.

¹⁰ H. Mathäus, *Metallgefäße und Gefäßuntersatzte der Bronzezeit der geometrischen und archaischen Periode aus Cypern*, in *PBF*, Abt. II, Bd. 8, München, 1985, S. 41–45, Taf. 123. 3–5; 124. 1–2; S. Vitlyanov, *Kovashki instrumenti i suorzheniya prez srednovekovieto v Bulgaria*, in *Arheologija*, 3, 1981, p. 60.

¹¹ H. Maryon, *Metal Working in the Ancient World*, in *AJA*, 53, 1949, 2, p. 93.

¹² For the ancient paleogeographic conditions in the region cf.: P. Petrov, S. Velev, V. Nikolov, *Kompleksno fizikogeografsko prouchvane na rayona na grad Ispereh s elementi na paleolandshefina rekonstruktsiya*, in *Terra Antiqua Balcanica*, Sofia, IV, 1990, p. 192–195.

¹³ High concentration of copper has been attested upon laboratory petrographic analysis of the hearth padding unearthed in Square 122/8. Metal penetration through the clay putty could be the result only of the metal melting in a blacksmith's hearth. The analysis has been carried out by Mr. V. Kurchatov, research associate in the laboratory of the department of Geology and Geography of the Sofia University.

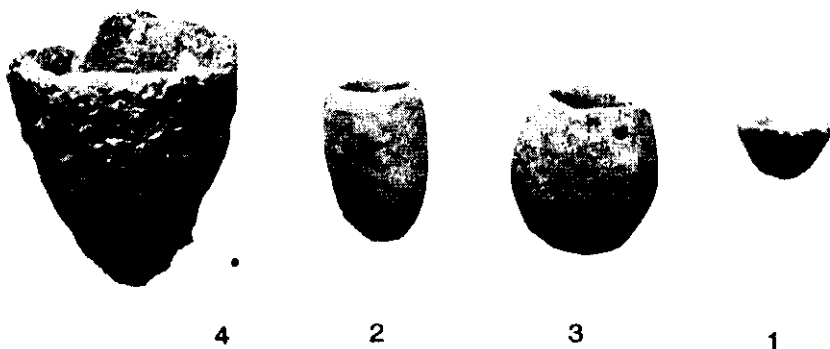
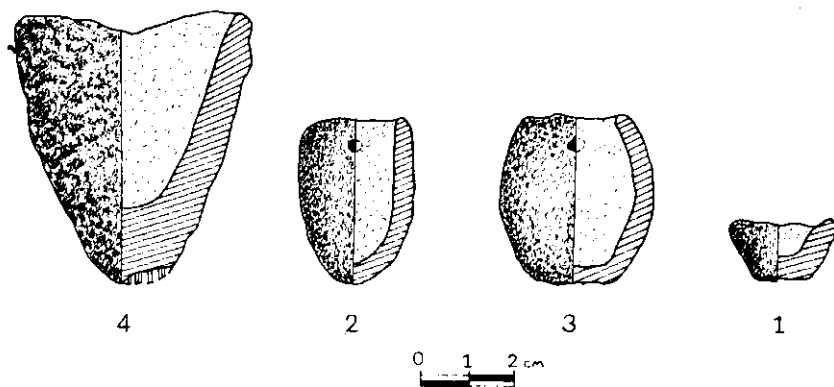


Fig. 4 Clay crucibles.



Drawing 2: Clay crucibles

The pots and crucibles for melting or pouring metals were linked with the furnaces and fireplaces. The small size of the crucibles (Cat. No. 1-3) (Fig. 4, Drawing 2) suggests that they were used for pouring small non-ferrous and precious metals. The smallest among the crucibles still bears the traces of white metal. Laboratory analysis will show whether it was silver tin or some other alloy. Especially interesting and highly informative is the crucible under Cat. No. 4. The porous structure of its walls, the deposits over the inner surface and the glazed outer surface indicate its multiple stays on the fireplace. It meets the

requirements for crucibles for refining silver and gold by using lead¹⁴. Crucibles close in shape have been known from the Getic centres on the opposite bank of the Danube¹⁵. They have been interpreted there as unquestionable articles of a jeweller's workshop inventory. The crucible has a very close parallel in Thanais¹⁶.

Proof positive of the non-ferrous and precious metals processing in the city workshops in "Sboryanovo" are the ingots and billets of gold (Cat. No. 8), silver (Cat. No. 9–11), bronze (Cat. No. 12–13) (Fig. 5) and lead (Cat. No. 14) (Fig. 5). The function of the last mentioned object as billet, the source of small pieces for making other articles, followed its original function as matrix. The gold and silver ingots bear the evident traces of mechanical modelling (forging) into a shape resembling parallelepiped after casting into an elongated crucible. The pair of nippers (pincets) (Cat. No. 7) (Fig. 6) was used to clip small pots, shifting small metal pieces and other operations.

The groups of tools represented below like small hammers, stamps (punches), hack irons, chisels, borers, files, awls and drifts (Cat. No. 15–38, 46–48) were connected with the principal operations of modelling, decoration etc. of the source billets. The small hammers (Cat. No. 15–18) (Fig. 6, Drawing 3) of various size form a representative collection of jeweller's implements as each of them served for different operations at different stages. In general they have good parallels in a collective find from Hellenistic Period jeweller's workshop comprising billets, implements and articles unearthed in the Illyrian fortress Daors¹⁷. The orifice diameters of the two smaller hammers indicate that they had metal shanks. The specific form of their working ends suggests that they were used for beating out (embossing) metal sheets. This used to be the common way manufacturing vessels or parts thereof out of copper, bronze, silver and gold¹⁸. The tool under No. 19 (Fig. 6) has not a trace of any shank orifice and its classifying as a hammer is provisional. The scar of metal link in its middle part prompts that it might have been soldered to a metal stem. In such a case it could have served as a miniature anvil like those used namely in toreutics and jewellery for embossing vessels and metal parts¹⁹. The hammers were also used for engraving shallow decorative grooves, stamping relief ornaments through punches and stamps, drilling holes by borers etc.²⁰.

¹⁴ R. Higgins, *Greek and Roman Jewellery*, London, 1980, p. 7–8.

¹⁵ D. Berciu et alii, *Descoperiri și însemnări de la Buridava dacică, I*, in *Thraco-Dacia*, IV, 1983, 1–2, p. 11, fig. 2/17; S. Morintz, D. Șerbăneșeu, *Rezultatele cercetărilor de la Radovanu, punctul "Gorgana a doua" (jud. Călărași). II. Așezarea geto-dacică*, in *Thraco-Dacia*, VI, 1985, 1–2, p. 22, fig. 3/2.

¹⁶ Št. Kolkówna, *Antike Werkzeuge zur Produktion metallener Juweliererzeugnisse aus der nördlichen und westlichen Schwarzmeerküste in Archeologia*, XXIX, 1978, S. 59, 90, No. 150, Abb. 123.

¹⁷ R. Gebhard, *Aus der Werkstatt eines antiken Feinschmiedes. Zum Depotfund von Ošanići bei im Jugoslawien*, in *Zeitschrift für Schweizerische Archäologie und Kunstgeschichte*, Bern, 48, 1991, 1, S. 5, Abb. 4; Z. Marić, *Depo pronaden u ilirskom gradu Daors*, in *Glasnik zentraljskog muzeja Bosne i Hercegovine u Sarajevu*, Sarajevo, N. S., XXXIII, 1978 (1979), p. 32–33, N-os 130–139, tabl. XXXIII–XXXIV.

¹⁸ H. Maryon, *op. cit.*, p. 94–99, fig. 2–10.

¹⁹ *Ibidem*, p. 95–98, fig. 3, 5–9; cf. R. Gebhard, *op. cit.*, Abb. 3. 128; Z. Marić, *op. cit.*, p. 128, table XXXI–XXXII.

²⁰ Cf. Note 19; R. Higgins, *op. cit.*, p. 12–15.

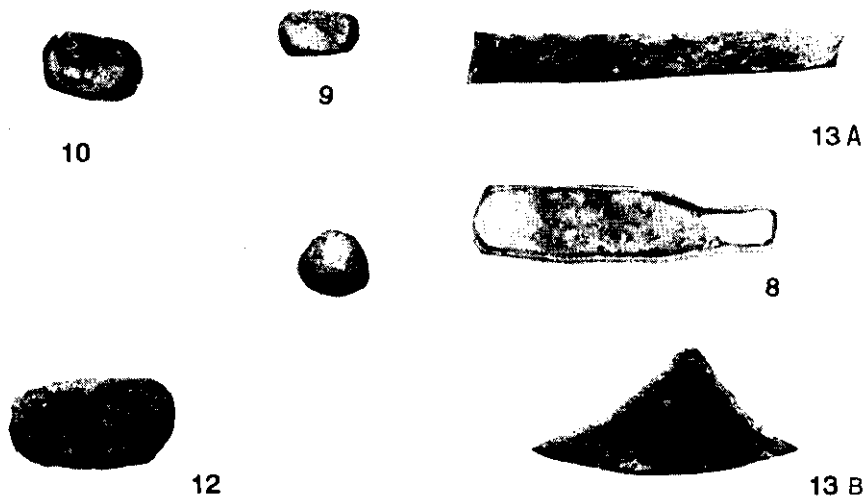


Fig. 5 An ingot of gold (No. 8), silver ingots (Nos. 9-11) and bronze billets.

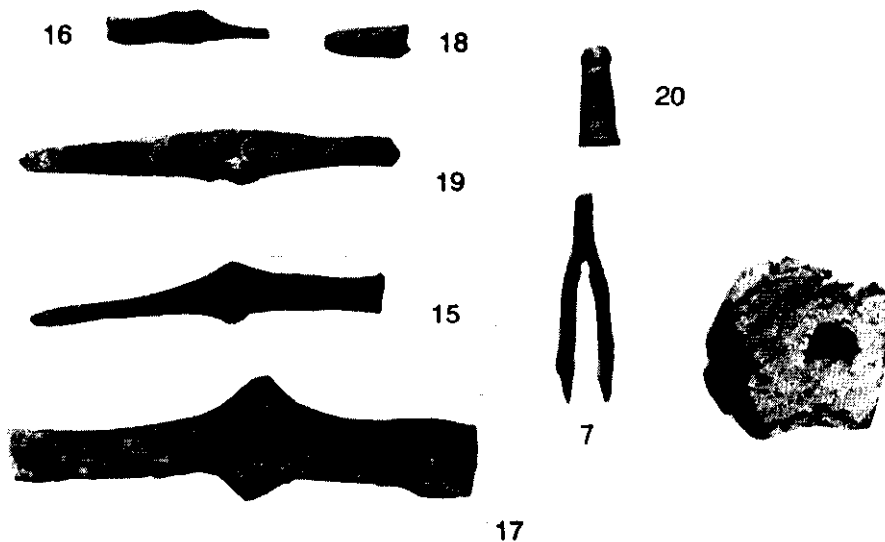
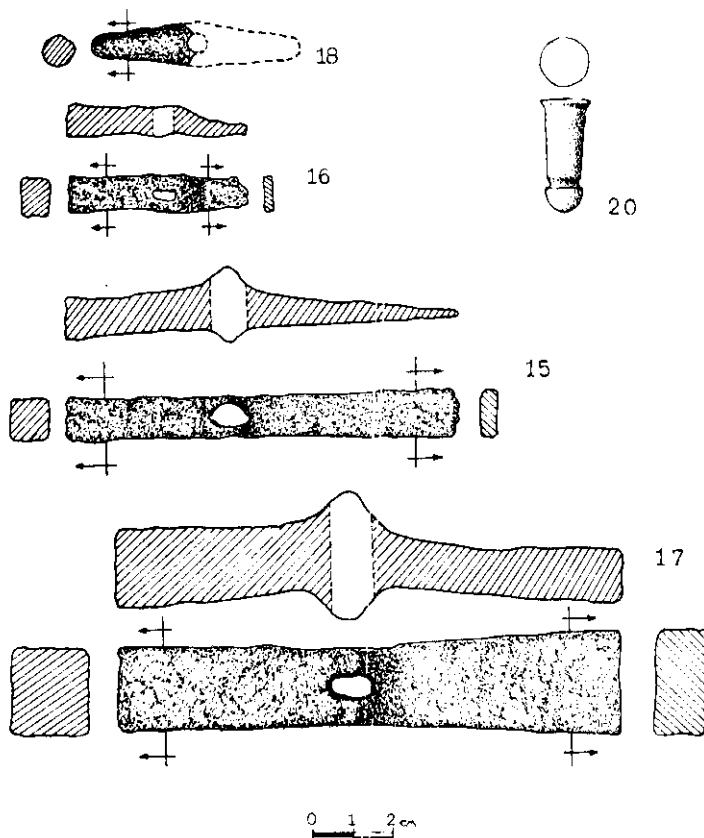


Fig. 6 Tools for fine metal working.



Drawing 3: Small iron hammers and a punch (No. 20).

Hammer No. 15, the bronze stamp No. 20 and the lead ingot No. 14 (Fig. 6, Drawing 3) are worthy of special consideration. The latter had been serving as matrix before turning into billet as it has been already mentioned. Although distorted two concave hemispheres are still evident on both its sides. Should a plate of a fitting diameter was placed upon by careful embossing it could have acquired hemispherical shape. Either individually or (with holes bored or a loop soldered) or after soldering together with another similar plate the article possibly turned into a part of an appliqué or an ornament – a pendant of a ring, a piece of a necklace etc. A similar hemispherical plate has been found in the lateral chamber of the tomb under "Ginina Mogila" Tumulus²¹. The lead billet is now hewn from all the sides, but in the period of its use as a matrix it should have had smaller holes. Therefore, although conditionally, the matrix, the bronze punch and the hammer unearthed to the north-east of the Southern

²¹ Al. Fol, M. Chichikova, T. Ivanov, T. Teofilov, *op. cit.*, p. 26, fig. 16. For the tools cf. Z. Marić, *op. cit.*, No. 2-4, tabl. XIII-XIV, XVIII, 2.

Gate represent a kit of jeweller's tools which advances the suggestion of a jeweller's workshop existence nearby the gate. This complex can be completed by the ring (finger rings?) casting mould now published by M. Tonkova²².

It could be expected that the variety of stamps with different decorative elements in the ateliers of the studied settlement was far richer. Tools like the round pointed awls were also used for free-hand finishing of parts and ornaments of metal plates and vessels. This way of metal working was associated with the so called repoussée technique²³.

Files (Cat. No. 30–33) (Fig. 7, Drawing 4) and the whetstones (Cat. No. 39–41) (Fig. 8) were probably utilized for grinding the cutting edges of the tools as well as for grinding some parts: casting fringes, angles etc. The small size files were certainly intended for metal working. The stone under Cat. No. 42 (Fig. 8) probably helped in the finest burnishing of details (or was a "touch-stone"²⁴).

Instruments that were more-probably associated with wood working like chisels (Cat. No. 26–27) (Fig. 9, Drawing 4), a saw (Cat. No. 43) (Fig. 7), lopping hooks (Cat. No. 44–45) (Fig. 10) and may be some of the round pointed awls too (Cat. No. 34–38) (Fig. 11, Drawing 4) worked when preparing wooden models or elements thereof, matrices, details serving for manufacturing moulds

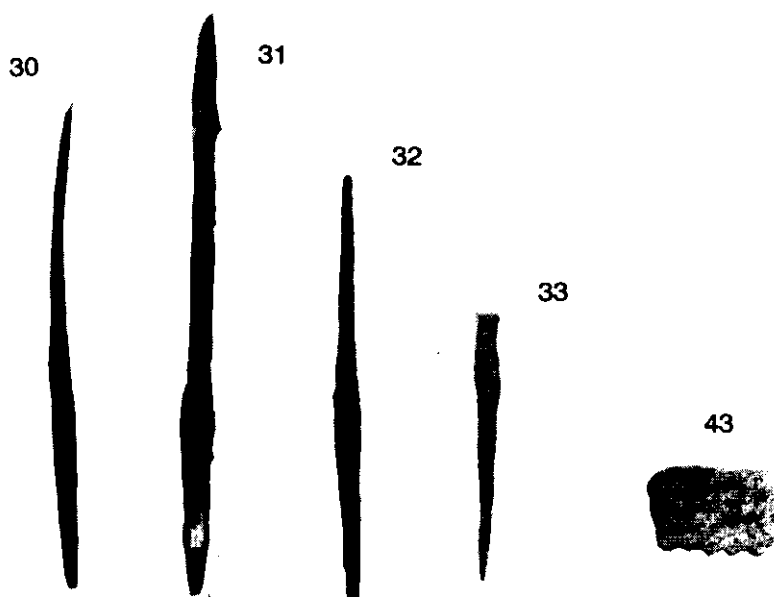


Fig. 7 Files (Nos. 30–33) and a fragment of a saw

²² M. Tonkova, *Vestiges d'ateliers d'orfèvrerie thraces des V^e-III^e s. av. J.C.*, in *Helis* III. 1, Sofia, 1994, p. 176, fig. 2.

²³ J. Ogden, *Jewellery of the Ancient World*, London, 1982, p. 35–43.

²⁴ R. Higgins *op. cit.*, p. 11–12.

and metal matrices and stamps²⁵. Of course, they could have been common wood working implements and the awls could have been used in leather-working too.

Metal instruments of elongated bipyramidal shape occurred often especially in the Central Excavation (Cat. No. 46, 48) (Fig. 12, Drawing 4). A similar tool designated as "drift" (hole enlargement tools for metal objects) is

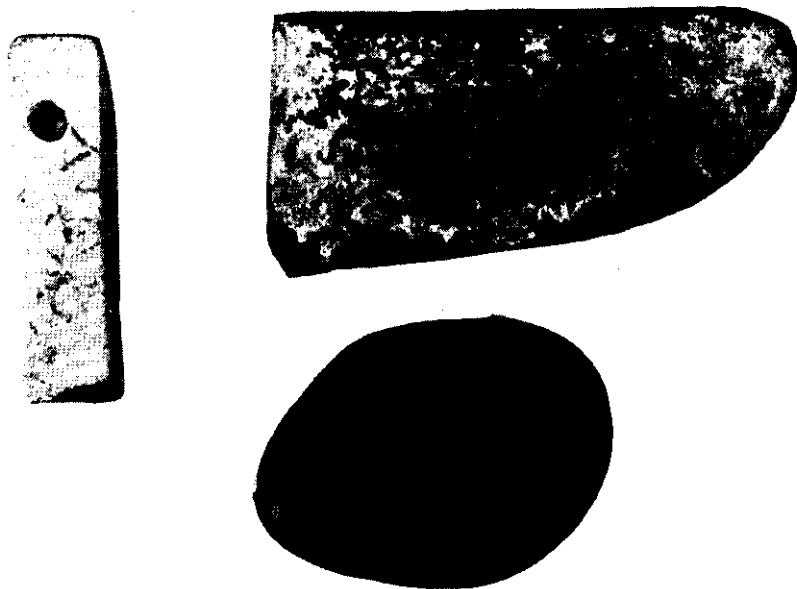
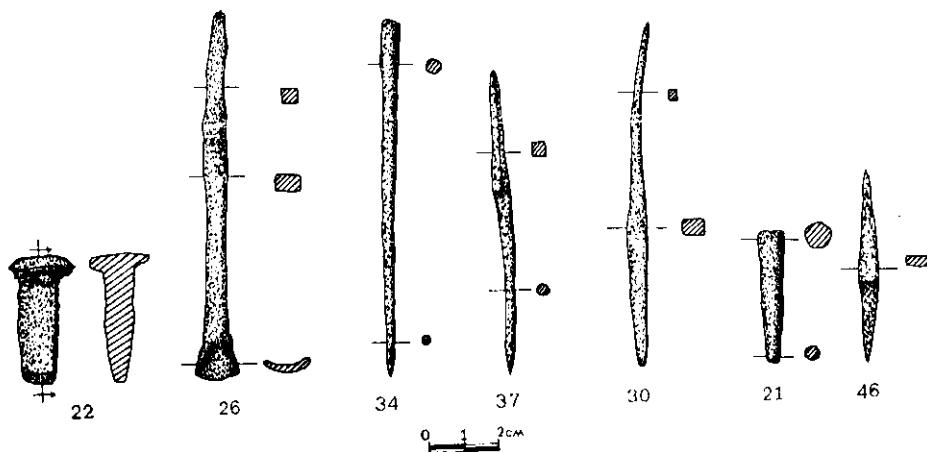


Fig. 8 Grinding stones



Drawing 4: Iron tools for metal and wood-working.

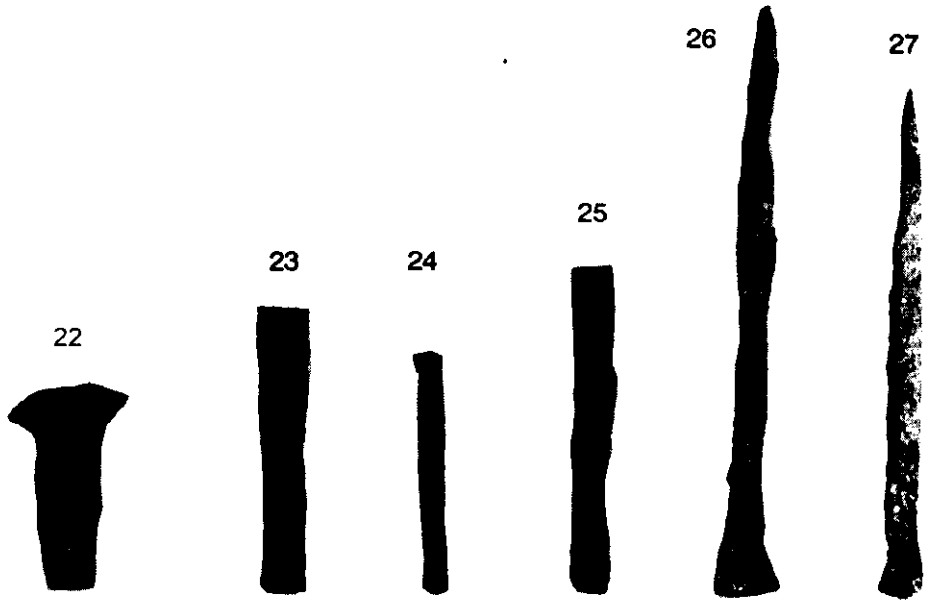


Fig. 9 Hack (Nos. 22-23) and chisels (Nos. 24-27).



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Fig. 10 Lopping hook.

known from Olynth²⁶. The presence of such tools in the settlement in "Sboryanovo" testifies of the metal working development.

It is worth nothing the possibility to reliably determine at least a great part of the workshops studied in the Central Excavation products. Those were fibulae, finger-rings, bracelets, other ornaments and metal appliqué. More than

²⁶ R. Pleiner, *op. cit.*, p. 25, fig. 105.

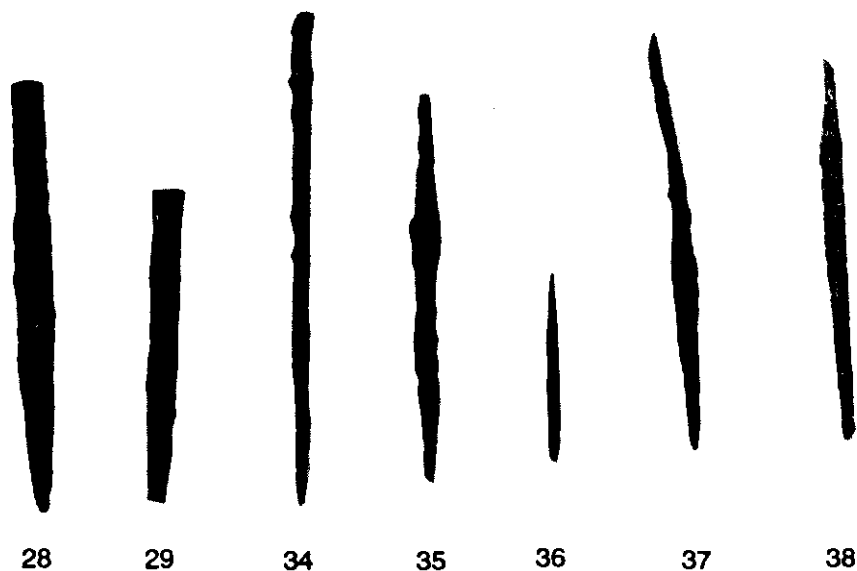


Fig. 11 Piercing tools.

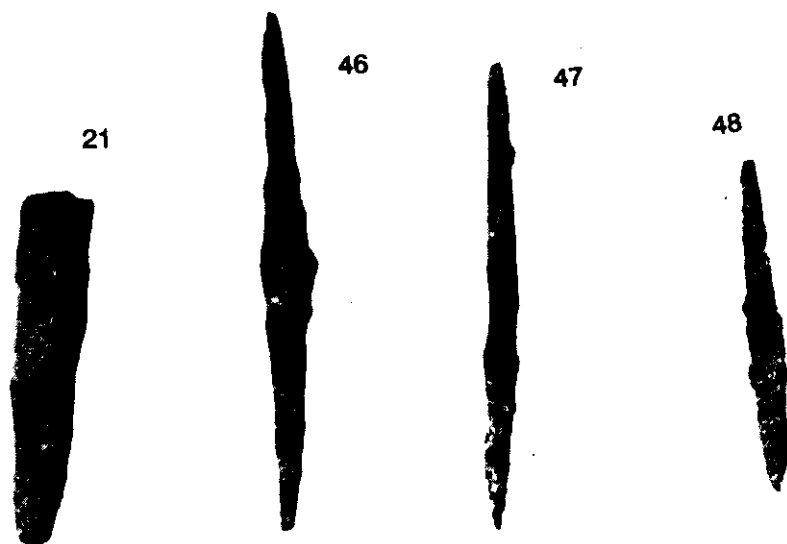


Fig. 12 Punch No. 21 and drifts No. 46-48.

40 intact and fragmented fibulae are so far known from the site. One of them has been made out of silver (cat. No. 49) (Fig. 13) while the rest are iron and bronze examples. The fibulae of the so called "Thracian Type" (Cat. No. 51-53) (Fig. 13) are predominant but Latène Type fibulae, characteristic of the 4th-3rd c. B. C. occur too (Cat. No. 49-50) (Fig. 13). Some bronze and iron billets

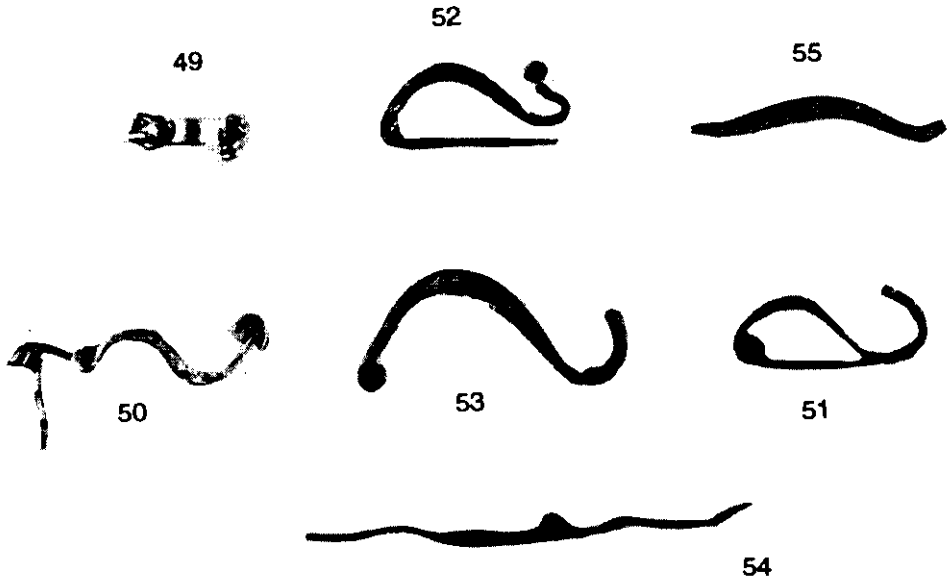


Fig. 13 Fibulae and billets: No. 49 (AG), No. 50-55 (bronze).



Fig. 14 rejects: No. 56 - bronze pendant, No. 57 - lead finger ring.

representing a wire thickened in the middle and with flattened projection at the end unambiguously indicate that following appropriate thermal and mechanic operations they would turn into fibulae (Cat. No. 54) (Fig. 13). Some of the fibulae fragments, especially parts of bows have either rounded or cut ends (Cat. No. 55) (Fig. 13). Therefore those were probably rejects. A lead finger ring (Cat. No. 57) (Fig. 14) shows out as a waster too. The plate of the common oval outline is decorated with a bird depicted in relief. The depiction however is damaged by the poorly cast and deformed plate. The ring cross-section is

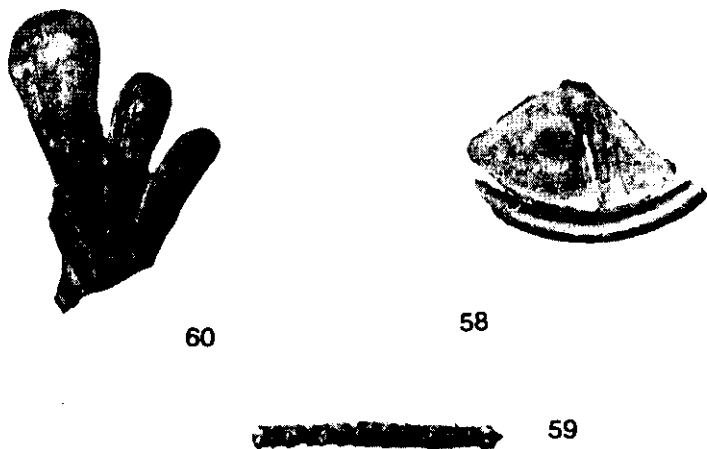


Fig. 15 Pieces of bronze appliqués.

asymmetrical as well. The casting fringe has not been smoothed down. So the 11 finger rings found at the site should be considered products of the local workshops. A bronze pendant with uneven, distorted cylindrical loop and ray elements. (Cat. No. 56) (Fig. 14) is certainly a waster too.

We should assume that a bronze palmette, a round plate (fragment) with cruciform relief ornament and elongated facing plate with relief decoration could have produced on the site. (Cat. No. 58–60) (Fig. 15).

A few small bronze kernels are of special interest. Their thickness and diameter equal to that of bronze coins, but they have been evenly cut in two. We could explain those articles only after some coins found in the settlement had been cleaned and interpreted. One of them is a reproduction in bronze of the Histrian drachmas type and has turned out to be cast in a mould. The other one represents a bronze imitation of Alexander type tetradrachmas, however heavily flattened at one end and cracked. (!). a piece of A "fourré"²⁷ coin should be of course added to the imitations mentioned. Having mind the above data which unambiguously indicates the functioning of metal working workshops (including jeweller's and toreutics) we should enlist the imitative minting among the production activities carried out in the settlement. So the archaeological evidence suggests the localisation of an Early Hellenistic centre of imitative minting – a question that is recently often raised in the numismatic publications²⁸.

²⁷ Detailed observations in: K. Dimitrov, *Coins from "Sboryanovo"*, in *Helis* III. 2, Sofia, 1995 (in print). The technological peculiarities have been confirmed by L. Netsov, eng., specialist in non-ferrous metals technology.

²⁸ C. Preda, *Sur les monnaies thraco-gètes – imitations de type macédonien*, in *Thracodacica*, I, 1976, p. 169–173; B. Rousseva, *Dve elinisticheski monetni sukrovishta ot selo Maluk Porovets. Razgradski okrug (IGCH 854 and IGCH 835)*, in *Numizmatika*, Sofia, 1987, 3, 3–12 and the cited literature. K. Dimitrov, *loc. cit.*; idem, *Kontakti na Trakiya prez rannoelinisticheskata epoha spored monetni sukrovishta*, in *Istoria i obshtestvoznanie*, Sofia, 1989, 5–6, p. 83–88 and the cited literature.

With the undeniable data about iron ornaments and other small iron articles production it should be reasonable to accept that at least some of the 34 iron knives as well as other tools and objects could have been produced in the local workshops. It is worthy to mention the five spurs, bridle elements, spring scissors etc. having certain parallels from synchronous sites in Thrace and beyond²⁹.

Production of tools for the purpose of metal working could have been either realized at the very spot or imported. Direct information about the presence of large smithy anvils, nippers, hammers etc. in the settlement has been for the time being missing. Their lack is however compensated by the smithy implements found in the "Ginina Tumulus" embankment³⁰. It is conceivable that larger scale iron and iron billets extraction for the blacksmith's purposes was organized outside the fortification wall.

Apart from producing various ornaments, appliqués, tools etc. the city workshops probably refitted such articles as well as metal and clay vessels. The pottery fragments with holes for clamps and the pieces of lead clamps together with the evident traces of lead working testify for the repairs of the last category of artefacts mentioned (Fig. 16).



Fig. 16 Fragments of a pithos clamped with lead.

²⁹ Y. Changova, *Trakiiskoto selishte ot I mil. pr. ne.* – Pernik, I, Sofia, 1981, p. 80, Fig. 341–2; L. Ognenova-Marinova, *Drebni nahodki, terakoti, skulptura*, in *Sevtopolis*, I, Sofia, 1984, p. 166, No. 178–202; R. Pleiner, *op. cit.*, p. 28, fig. 1312; R. Vulpe, *Așezări getice din Muntenia*, București, 1966, p. 36, fig. 15, 29 etc.

³⁰ The implements have not been published. The forthcoming publication by M. Chichikova and the team of the mentioned tumulus excavators. We are grateful to Mrs. Chichikova for the opportunity to use the information in advance.

CATALOGUE

1. Crucible, clay, well purified, smooth black surface. Asymmetrical shape, rounded bottom. Uneven hemispherical receptacle with traces of white metal over the bottom.
Ht - 1.1 cm; mouth D - 2.2 cm
Inv. No. 893
2. Crucible, clay, well purified, greyish black colour of the surface. Elongated, egg-shaped, rounded bottom. At 0.3 cm beneath the mouth two round holes situated diametrically.
Ht - 3.4 cm; D max. - 2.1 cm; wall thickness - 0.1-0.4 cm
3. Crucible, clay, well purified, brick-coloured. Cylindrical shape with slightly rounded outline, flat bottom. At 0.4 cm beneath the mouth two round holes situated diametrically.
Ht - 3.5 cm; D max. - 3.2 cm; bottom D - 1.6 cm.
Inv. No. 899.
4. Crucible, outer surface glazed under high temperature impact, porous inner surface (coke-like). Greyish black colour of the surface of breaking. Cone-shaped, small breakings off over the mouth and the outer surface of the bottom.
Ht - 5.7 cm; mouth D - 5 cm; wall thickness - 0.8 cm.
Inv. No. 54/92.
5. Small rake, iron. Massive trapezium-shaped working part. Cutting edge unilaterally ground at acute angle. Working part continues into a massive shank of rectangular cross-section, constricting towards the end. After 3.3 cm the shank sharply diminish in thickness and turns upwards arch-like. This part (ca. 11.5 cm long) was probably intended to be stuck into wooden shank.
Total L - 21 cm; working part L - 6 cm; width - 5×2 cm and 4×7 cm; thickness - 0.3-0.6 cm.
Inv. No. 742.
6. Rake, iron. Massive trapezium-shaped working part. A shank of square cross section stretching from the middle of the short side. Entire shank is cord-like twisted and ends with a ball of 2×2.2 cm in diameter.
Total L - 43 cm; stem L - 32.5 cm; working part W - 10×11.8 cm
Inv. No. 887.
7. Nippers, iron. Corroded.
L - 5.7 cm.
Inv. No. 891.
8. Ingot, gold. Rectangular cross section formed by forging out. One of the ends bears traces of stretching and cutting out while the other one is rounded.
L - 3.5 cm; W - 0.4 cm; Wt - 10.5 gr.
Inv. No. 912.
9. Ingot, silver. Rectangular cross section formed by forging out. Both ends rounded.
L - 0.9 cm; W - 0.5 cm; Ht - 0.3 cm; Wt - 1.4 gr.
Inv. No. 843.
10. Ingot, silver. Similar with the preceding one.
L - 0.9 cm; W - 0.83 cm; Ht - 0.42-0.44 cm; Wt - 2.8 gr
Inv. No. 976.
11. Ingot, silver. Irregular hemispherical shape. Underneath flat.
D - 0.73-0.85 cm; Ht - 0.44 cm; Wt - 1 gr.
Inv. No. 997.
12. Ingot, bronze. Like cat. No. 9
L - 2 cm; W - 1 cm; Ht - 0.6-0.7 cm. Wt - 9.1 cm.
Inv. No. 814
- 13a. Object of rectangular cross section, bronze. One of the ends broken while the other bears the traces of cutting.
L - 4.6 cm; Ht - 0.3 cm; W - 0.6 cm.

13b. Plate, bronze, nearly triangular in shape. Two of the sides bear traces of cutting by using stamp.

Inv. No. 8/91.

Dimensions: 3.3 and 1.6 cm; thickness – 0.1 cm.

14. Piece of lead, a part of mat (matrix). Irregular shape resulting from cutting off the periphery. Shallow hemispherical fossettes on both sides with the surface around them damaged by hammer blows. The fossettes edges are slightly distorted.

Sides dimensions: 5×3.4 cm; thickness – 2.6×2.9 cm;

fossettes D – 1.6×1.4 and 1.2×1 cm; depth – 0.7 cm

Inv. No. 79/92.

15. Small hammer, iron. half of the body is of square cross section, gradually increasing in height. A shank hole in the wider part. The rest is thinner and ends with rectangular cross section. Well preserved.

L – 9.8 cm; H max. (at the shank) – 1.6 cm; body W – 1 cm; hole D – 0.5×0.2 cm.

Inv. No. 557.

16. Small hammer, iron. Similar to the previous one. Heavily corroded.

L – 4.5 cm; Ht max. (at the shank) – 0.9 cm; body W – 0.8 cm; hole D – 0.5×0.2 cm.

Inv. No. 914.

17. Small hammer, iron. Similar to the previous one. Well preserved.

L – 12.5 cm; Ht max. (at the shank) – 3.3 cm; body W – 2.1 cm×2.5 cm.

Inv. No. 1/92.

18. Small hammer (?), iron, fragment. The preserved half of the body is conical with rounded top. A shank hole at the widest part.

L (preserved) – 2.4 cm; body D (max.) – 1 cm; hole D – ca. 0.5 cm.

Inv. No. 6/92.

19. Small hammer (6), iron. The half of the body is of elongated conical shape and rounded top. Except the extension in the middle, the remaining part is of square cross section and ends with deformed top. There is no evident traces of hole for a shank. Heavily corroded.

L – 10.6 cm; max. thickness – 1.4 cm; top D – 0.55–0.6 cm.

Inv. No. 87/91.

20. Stamp, bronze. Conical shape with rounded top, separated from the body by a shallow groove of width of 0.2 cm at 0.6 cm beneath the top. The base has been widened as a result from mechanical blows. Very well preserved.

Ht – 2.8 cm; base D – 1.2 cm.

Inv. No. 590.

21. Punch, and iron tool. The body is of elongated conical shape. The top is rounded (blunted) of diameter of 0,35 cm.

Corroded.

L – 3.75 cm; D max. – 0.7 cm.

Inv. No. 97/90.

22. Hack iron, iron. Short massive body of rectangular cross section, sharpened at the end but keeping up the body width. The other end is deformed by mechanical blows. Corroded.

L – 3.8 cm; body W – 1×1.1 cm; "head" dimensions: 2×1.2 cm.

Inv. No. 866.

23. Hack iron, iron. Like the previous one. Corroded.

L – 5.1 cm; body dimensions: 0.5×0.8 cm.

Inv. No. 520.

24. Chisel, iron. Body of rectangular cross section. Sore cutting edge. The other distorted by mechanical blows.

L – 4.3 cm; body dimensions: 4×3 cm.

Inv. No. 20/91.

25. Chisel, iron. Like the previous one, but the cutting edge is preserved.

L – 6 cm; body dimensions: 7×5 cm.

Inv. No. 908.

26. Chisel for wood working, iron. Rectangular body cross section. Cutting part extended and curved in a fan shape way. The stem for sticking into the wooden shank is of pyramid shape and is separated by a shallow groove. Corroded.

L - 10.7 cm; working part L - 7 cm; blade W - 1.25 cm.

Inv. No. 888.

27. Chisel for wood working, iron. Like the previous one, but the cutting edge is damaged. Heavily corroded.

L - 9.5 cm; blade W (preserved) - 0.8 cm.

Inv. No. 221/90.

28. Borer, iron. Square cross section of the body getting thinner towards the end, with well formed top. Traces of mechanical blows on the other end. Corroded.

L - 9 cm; W - 0.6×0.6 cm.

Inv. No. 181/90

29. Borer, iron. Like the previous one, but the top is broken.

L - 6.5 cm; W - 0.4×0.5 cm.

Inv. No. 740.

30. File, iron. Tetrahedral body, consisting of two parts: the one is of rectangular cross section and top serving for adjoining to a wooden shank; the other one which is the working part gets wider and turns into elongated pyramidal shape without formed top. Slanting intended lines are evident over the working part. Corroded.

L - 10 cm; working part dimensions: 0.4×0.5 cm; prong dimensions: - 0.2×0.3 cm.

Inv. No. 739.

31. File, iron. Like the previous one. Corroded.

L - 12.2 cm; working part dimensions: 0.4×0.6 cm; prong dimensions: - 0.3×0.4 cm.

Inv. No. 901.

32. File, iron. Like the previous one, but the prong for adjoining to the wooden part is of circular section. Corroded.

L - 8.7 cm; working part dimensions: 0.3×0.5 cm; prong D - 0.3 cm.

Inv. No. 902.

33. File, iron. Like No. 32., but the prong is missing (broken). L (preserved) - 5.5 cm; working part dimensions: 0.4×0.5 cm; prong D - 0.3 cm.

Inv. No. 303/90.

34. Awl, iron. Circular section of the body. Well formed top at one end. Corroded.

L - 10.3 cm; D max. - 0.6 cm.

Inv. No. 56/91.

35. Awl, iron. Like No. 34. Corroded.

L - 8 cm; D max. - 0.6 cm.

Inv. No. 255/90.

36. Awl, iron. The two thirds of the tool are of rectangular cross section and sharp point at the end. The remaining part is of circular cross section strongly thinned and sharpened, well formed point. Corroded.

L - 4 cm; thickness - 0.2×0.3 cm.

Inv. No. 325/90.

37. Awl, iron. Working part of circular section. The part for adjoining to the wooden shank is of rectangular section.

L - 8.8 cm; max. thickness - 5.5 cm; working part L - 5 cm.

Inv. No. 889.

38. Awl, iron. Like No. 35, but the prong is broken and slightly crooked. Corroded.

L - 8 cm; D - 0.4 cm.

Inv. No. 298/90.

39. Whetstone. Tongue-shaped. Well formed, with evident traces of friction over the four sides. Fine grained structure.

L - 10.3 cm; W max. - 4.9 cm; thickness - 1.6-1.7 cm.

Inv. No. 756.

40. Whetstone. Parallelepiped shape, almost square cross section. A small hole for hanging up has been bored at the one end. The middle parts of three of the walls are polished and sunken as a result from prolonged use. Fine grained structure.

L - 6.8 cm; cross section - 1.6×1.8 cm; hole D - 1.7 cm.

Inv. No. 772

41. Whetstone. Pyramid-shaped. One of the large sides is evidently sunken out of prolonged use. Rough surface.

L max. - 7.2 cm; thickness max. - 3.8 cm.

Inv. No. 40/91

42. Stone for fine grinding. Boulder of volcanic origin, black colour, dense, very strong. Smoothed out from all sides. Elliptical shape of semicircular cross section.

L - 6.8 cm; W - 4.8 cm; thickness - 2.2 cm.

Inv. No. 104/90

43. Saw, iron, fragment. Corroded.

L (preserved) - 2.8 cm; W - 1.9 cm; thickness - 1.5 cm

Inv. No. 892.

44. Wood smoothing tool, (lopping hook), iron. Unilaterally sharpened, with two shanks (one of them broken), bent perpendicularly. Heavily corroded.

L (preserved) - 7.4 cm; shank Ht - 0.9 cm; shank W - 0.4 cm; thickness max. - 0.25 cm; cutting part W - 1 cm.

Inv. No. 42/90

45. Wood smoothing tool, iron. Like the previous one, more heavily damaged by the corrosion.

L - 8.5 cm.

Inv. No. 208/90

46. Drift (hole increasing tool), iron. Elongated, bipyramid-shaped, sharp-pointed. Corroded.

L - 5.5 cm; W max. - 0.6 cm.

Inv. No. 326/90.

47. Drift, iron. Like the previous one. Corroded.

L - 3.55 cm; thickness max. - 0.37 cm.

Inv. No. 34/91

48. Drift, iron. Like previous one. Corroded.

L - 5 cm; W max. - 0.3 cm.

Inv. No. 304/90.

49. Fibula, silver. Bow horizontally widened and arch-shaped, getting thinner towards the ends and turning into rounded wire. The wire turned opposite at the pin holder and four times spiral-like twisted around the bow. Through the same spiral twists at the back end the bow goes into pin.

L - 1.95 cm; Ht - 0.9 cm; bow cross section - 0.55×0.2 cm.

Inv. No. 971.

50. Fibula, bronze. Like No. 49 (Latin type).

L - 2.5 cm; Ht - 0.9 cm; bow cross section: 0.55×0.2 cm.

Inv. No. 920.

51. Fibula, bronze. Thracian type. Made out of round wire of even thickness. Pin-holder ending with a small biconical fillet.

L - 3.4 cm; Ht - 1.35 cm; bow thickness - 1.7 cm.

Inv. No. 924.

52. Fibula, bronze. Thracian type, similar to the previous one, slightly thickened bow, S-shaped pin-holder. Well preserved, green patinated.

L - 3.3 cm; Ht - 1.5 cm.

Inv. No. 867.

53. Fibula, bronze. Thracian type. Similar to No. 52, the pin-holder turned vertically upright.

L - 4.6 cm; Ht - 2 cm; thickness - 0.4 cm.

Inv. No. 923.

54. Object (a piece of biller for making a fibula), bronze. Unevenly thickened wire. Thickened part at the one end is trapezoid-shaped (probably the spot for the pin holder).

L - (preserved) - 8.8 cm; thickness - 0.1 - 0.25 cm.

Inv No - 168/90

55. Object (fibula bow), bronze. Both ends broken.

L - 4.4 cm.

Inv. No 54/90.

56. Pendant, bronze Rosette of bilateral relief leaves of various lengths around cylindrical plug. Casting of poor quality. Green patina.

Plug D - 1.2 cm; plug Ht max. - 0.7 cm; pendant d - 2.65 cm.

Inv. No. 30/90.

57 Finger ring lead. Irregular elliptical bezel with depiction of bird in relief. The ring bears the traces of the casting mould Slightly deformed. Rough edges. Probably a eject. Ring: D - 2.3×2.4 cm; cross section - 0.2×0.3 cm; Bezel: 2.3×1.2 cm.

Inv. No. 765

58. Appliqué, bronze, fragment Round made out of thin sheet. Decorated with two concentric and a pair of radial lines, partly preserved.

Inv. no. 1009/90.

Fragment dimensions: W - 1.8 cm; Ht - 1.5 cm; D - 3.3 cm; thickness - 0.02 cm.

59. Appliqué, bronze, fragment Made out of hemispherical wire. The face decorated.

L - 2.3 cm; thickness - 0.2 cm.

Inv. 319/90

60. Appliqué, bronze, fragment. Three rounded leaf-shaped projections of different size. The smaller probably had symmetrical pairs, now broken. The fragment is covered with green patina.

Ht - 2.8 cm; W - 2 cm; thickness - 0.1 cm.