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Meat Eaten by Roman Soldiers at the Sentry Post on Kazackaya Hill near Inkerman (Sevastopol, Ukraine) (Pl. 130-131)

The Roman sentry post on Kazackaya Hill (**Fig. 1**) was discovered by chance in 1991. Some land within the city limits of Sevastopol that had not been developed before was divided into garden plots. While the foundations for a cottage were being laid on one of the plots, some architectural remains were found. The investment was suspended and rescue research was carried out. It involved only a small part of the site and aimed at documenting the destroyed area (SAVELJA 1997). It was only in 2000-2002 that the methodical excavations were performed by the researchers from the National Archaeological Museum and Preserve "Chersones Tavriceskij" in Sevastopol and the Institute of Archaeology, Warsaw University .

There were three seasons of excavations which resulted in discovering some architectonic remains (the lists of which have already been published) and movable relics (also mentioned: SARNOWSKI, SAVELJA, KARASIEWICZ--SZCZYPIORSKI 2002; 2007), as well as a substantial number of animal bone remains. The aim of this paper is the archae-ozoological analysis of this osteological material which will give us new data about the meat eaten by Roman troops during the principate.

Site description

In the middle of the sentry post there was a square tower with an entrance on its east side. It was enclosed with a wall and a ditch. There was a narrow pass across the ditch and a gate in the enclosure wall that enabled entering the post from the south. The area encircled by the wall constituted a round courtyard. It was partially filled with small buildings built along the inner side of the enclosure wall (**Fig. 2**).

The sentry post was used in the second half of the 2nd century and the first half of the 3rd century (SARNOWSKI, SAVELJA, KARASIEWICZ-SZCZYPIORSKI 2002: 170; 2007: 57-64). More exact dating was not possible, the chronology was established on the basis of the roofing tiles with stamps of the military manufacturing companies (SARNOWSKI 2005).

The first publication (SARNOWSKI, SAVELJA, KARASIEWICZ-SZCZYPIORSKI 2002) did not express the doubts of the search team concerning the stratigraphic niceties. Another analysis of the data proved that there were two different phases in the usage of the post. However, it is difficult to determine unambiguously whether these chronological phases correspond to the two periods of the soldiers' presence at the sentry post: in phase 1: the soldiers from *vexillatio Exercitus Moesiae inferioris* (= VEMI), in phase 2: from the *legion[legio?] XI Claudia*.

The lack of continuity or the signs of alteration could be observed only in some of the buildings. This situation, which causes problems with interpreting the data, is not the result of negligence in the course of the research but

[1] The excavations were led by O. Ja. Savelja from the National Archaeological Museum and Preserve "Chersones Tavriceskij" in Sevastopol and by T. Sarnowski and R. Karasiewicz-Szczypiorski from the Department of Archaeology of Roman Provinces, Institute of Archaeology, Warsaw University. This paper is based on the MA thesis written by M. Rutkowska under the supervision of Prof. A. Lasota-Moskalewska. The research of the Polish expedition on the Crimean Peninsula was supported by the following institutions, companies and individuals: the Foundation for Polish Science; the Foundation for Students and Alumni of Warsaw University "Universitas Varsoviensis"; Town Hall in Iłża; BANK PRZEMYSŁOWO-HANDLOWY PBK S.A.; NAŁĘCZOWIANKA S.A.; COMPUTER RESSELER NEWS POLAND; IZBA GOSPODARCZA ENERGETYKI I OCHRONY ŚRODOWISKA Warsaw; EMCA Warsaw; WARSZAWSKIE PRZEDSIĘBIORSTWO ROBÓT DROGOWYCH S.A.; PRZEDSIĘBIORSTWO ROBÓT INŻYNIERYJNYCH POL--AQUA II S.A. Piaseczno; PPH PLANETA Sp. z o.o. Warsaw; PPHU EFEKT Sp. z o.o. Warsaw; JARVIT-BIS Sp. z o.o. Warsaw; BEPEX Sp. z o.o. Warsaw; ZAKŁADY.MIĘSNE JADÓW Sp. z o.o.; PRZEDSIĘBIORSTWO BUDOWLANO-TELEKOMUNIKACYJNE MBT Sp. z o.o. Marki; UNIBONUS BROKER'S GROUP Sp. z o.o. Warsaw; ELPE-ELEKTROPRODUKT Sp. z o.o. Cracow; KEMP Sp. z o.o. Warsaw; P.R.T. TELPOL Warsaw; IMAGIS Warsaw; ELKAB Biuro Projektowania Warsaw; SAMPO T.U. Warsaw; PRACOWNIA BADAŃ NIENISZCZĄCYCH; MARC-TH Warszawa; PTUH CEZAR Puławy; ZAKŁAD USŁUGOWO-HANDLOWY JAN WARZOCHA Sandomierz; UZZI Zduńska Wola; PHU RESLER PLUS Chojnice; OSIEM i PÓŁ Piastów; IW-MAR Olsztyn; H., T. Niemirowscy; D. Badora-Zawadzka; W. Kowalczyk; J. Lezarowicz; M. Piłat; A. Wolska; A. Cichocki; M. Kałuszko; J. Kołnierzak.

is caused mainly by numerous modern alterations. So far there are no sufficient arguments to support the idea that the post was once destroyed and then rebuilt or that the whole post was alternated. The fact that the observed changes were restricted to a small area indicates a possible short-term absence of the garrison. The sequence of layers on the enclosed profiles (**Fig. 3.1**, **3.2**) show the alteration (renovation?) on the ground floor of the tower and in several rooms around the courtyard.

The original usable floor in the remaining part of the tower is marked by a thin layer of trodden ash (**Fig. 3.1**). In the upper part of the layer few pieces of roofing tiles were found. Above that, along the west wall of the tower, some stones had been originally laid, probably to serve as a bench. Only above them there is some rubble created when the tower was falling into ruin. It consists mainly of roofing tiles in its lower part and of stones in its upper part. The bench was probably laid some time after the place had been settled. It is unlikely that the tiles under the bench constituted one of the layers of the original floor. These are probably small fragments of architectural ceramics pressed down into the dirt floor by the weight of the stone bench.

In the room A1 the west wall was built on a higher level than the south (older?) wall (**Fig. 3.2**). Below the foundation base of the west wall there is a layer of pure clay and only then the original usable floor space can be found. Like in the tower, it is visible because of the ash tracked over the dirt floor. Evidently this place was also converted with time. The presence of pure clay is not accidental. During the exploration of an identical layer in the partly-destroyed room B, the outlines of some regular clay blocks (raw bricks?) could be seen. The excavated relics were found either above or below the clay layer which points to the existence of two usable floor spaces. During the excavations in the buildings surrounding the courtyard, no stone rubble or roofing tile remains were found. It may be assumed that the clear outline of stone walls marks the foundation on which the clay walls were erected and the building was roofed with impermanent organic materials. A break in using the sentry post brought about the fall of these primitive buildings. Re-settling the place led to the repair or rebuilding of the impermanent walls. Apparently during the cleaning part of the stone rubble was left under the new usable floor space. Such an idea is not exceptional; a similar pattern has been observed in the citadel of Chersonesos, which was also occupied by Roman troops. The buildings of the second phase were erected about one metre higher, that is on the rubble belonging to the first phase (KARASIEWICZ-SZCZYPIORSKI 2001).

The above-mentioned data point to the rebuilding of at least some of the buildings at the post. There is a lot of evidence suggesting simultaneous reconstruction of the buildings surrounding the courtyard. Unfortunately, at the present stage of research it is impossible to correlate these changes with the phases distinguished for the citadel of Chersonesos.

Whenever it was possible, the movable relics were assigned to one of the two usable floors. The same procedure was applied to the osteological material.

Material and methodology

The examined osteological material was obtained during three seasons of excavations in the years 2000-2002. It came from various places: the tower, the living quarters and the utility rooms (A, A1, B, C1, C2, D, E, F, G, H, I), including two hearths in the rooms A and A1, and the pithos found in the room D, the ditch and the courtyard, and also from between the stones in the enclosure wall (**Table 1**). The excavation of the bone remains did not include sifting.

1.715 bone remains were excavated, 1.144 pieces were identified anatomically and typically, which is 66.7 % of all the examined fragments. The bones were in quite good condition; they were post-consumptional remains as they bore signs of being prepared for consumption and of the consumption itself.

The statistical analysis was carried out twice: first for all the bone remains from the whole cultural layer and then for the osteological material from the places where two using phases had been distinguished. Determining the two phases was possible for the tower, rooms A1, B, C1, D and the courtyard. The material from the ditch and the places where only one using phase had been determined or the clear distinction between the two phases was not possible was not included in the second analysis.

A comparative analysis was carried out for the animal bone remains from different parts of the sentry post (the tower, utility rooms, the courtyard) and for both using phases. In each case a zoological analysis was made and the data were tabulated, including domestic and wild animals, molluscs, birds, fish, as well as particular species of domesticated mammals. For this last group, homogeneity of the osteological material was tested for both using phases (LASOTA-MOSKALEWSKA, SULGOSTOWSKA 1976/1977).

The anatomical distribution was analysed, provided that there were more than 100 bones of a given species. The remains were categorised into two big groups: valuable and less valuable for consumption. The first group included head bones (cranium, mandible, horn cores and teeth), the body (vertebrae and ribs), proximal parts of the forelimb (scapula, humerus and radius with ulna) and proximal parts of the hind limb (pelvis, femur, tibia and fibula). The second group comprised distal parts if the forelimb and the hind limb (carpal, tarsal, metacarpal and metatarsal bones) and digital bones. The percentage of fragments belonging to these two groups was calculated for each species.

The age of the animals was reconstructed on the basis of their teeth development (LUTNICKI 1972; MÜLLER 1973) and the fusion of long bone bases with shafts (KOLDA 1936). The percentage of animals killed before reaching morphological maturity was estimated for

each species. Sex analysis of pig, goat and horse was based on the anatomical features of sexual dimorphism (LASOTA-MOSKALEWSKA 1997).

The bones were measured according to the unified Driesch's method (1976). The osteological measurements were converted into points of the point-scale method which helped to reconstruct the cattle morphology (LASOTA-MOSKALEWSKA 1984) and the horse morphology (KOBRYŃ 1989). The horse withers height was also calculated according to Kiesewalter's coefficient (quoted after DRIESCH, BOESSNECK 1974) and the sheep withers height according to Teichert's coefficient (quoted after DRIESCH, BOESSNECK 1974). The bone marks caused by taphonomic factors were also described.

The zoological distribution of domestic mammals on Kazackaya Hill was compared with the sites settled by the soldiers of the Lower Moesian army. The comparative analysis included a temple in Balaclava on the Crimean Peninsula (GRĘZAK, PIĄTKOWSKA-MAŁECKA 2000) and a military camp of the *legio I Italica* at Novae. The material from Novae came from three different contexts dated at the 1st century AD (GRĘZAK, LASOTA-MOSKALEWSKA 1998), the turn of the 2nd and the 3rd centuries AD (MAKOWIECKI, SCHRAMM 1995) and the 4th century AD (GRĘZAK, PIĄTKOWSKA-MAŁECKA 2000a).

Results

In the identified osteological material mammal remains were most common (89.5 %), while the bone remains belonging to other classes were less common, with 1.7 % for birds, 0.2 % for fish and 8.6 % for molluscs (**Table 2**). Six of the bird remains belonged to hen and molluscs were mainly represented by the *Unio sp.* shells, while oyster shells and snail shells were less numerous.

Mammals were represented mainly by domestic animals (99.0 %). Only 1 % of the remains belonged to wild animals. It included the bones of roe deer, wild boar, hare, gazelle and fallow deer, as well as few micro-mammal remains. One of them was identified as belonging to a rodent of the *Muridae* family. There were also several remains of a small or big ruminant but it was impossible to determine whether they belonged to wild or domestic species.

More than half of the domestic animal remains belonged to sheep and goat (59.1 %). Pig remains came second (21.2 %), followed by cattle (14.0 %). Horse and dog bone fragments were less common (4.5 % and 0.9 %, respectively).

The comparative zoological analysis of the osteological material from the tower, utility rooms and the courtyard showed numerous similarities (**Table 3**). In all the examined locations domestic animal remains were dominant and only a few bones belonged to wild animals and birds. Mollusc remains occurred in all three places but their biggest number and concentration was observed in the courtyard. There were no fish remains, except for one fragment found in the courtyard. The zoological analysis of the domestic animal remains showed that sheep and goat bones were dominant in all the examined locations and constituted 60.0 % of the material. The percentage of the two remaining breeding species differed considerably. In the utility rooms pig remains came second (25.0 %), followed by cattle, which were far better represented in the courtyard (over 11.0 %) than in the rooms (2.5 %). In the material from the tower there were more cattle remains (24.0 %) than pig remains (12.7 %). Horse and dog remains were ranked lower in all the examined locations.

The comparative zoological analysis of the osteological material from the two chronological phases pointed to some differences (**Table 4**). Domestic animal remains prevailed in both phases. The bones of wild animals, birds and invertebrates were less common, and the percentage of bird and invertebrate remains decreased considerably in the second phase. Domestic animal remains belonged mainly to sheep and goat, constituting 54.2 % of the material in the first phase and increasing to 64.5 % in the second phase. Pig remains followed and cattle bone remains were in the third place, but the percentage of their bones diminished with time: from 16.9 % to 10.6 % for cattle and from 24.8 % to 19.6 % for pig. Horse and dog were least represented in both phases.

The homogeneity analysis for the cattle, pig, sheep and goat, and horse osteological material revealed that it differed in both phases. The result of the Chi-square test also proved it, as it was 9.68>7.815; with ÿ=0.05 and v=3 (**Table 5**). There were surplus cattle and sheep and goat bones in the first chronological phase.

The analysis of the anatomical distribution was carried out for cattle, pig, sheep and goat and horse bone remains (**Table 6**). In the cattle osteological material prevailed valuable carcase parts, mainly body parts (58.3 %). Less valuable head parts came second (18.7 %), followed by proximal parts of the forelimb and hind limb, which constituted 0.7 % and 2.9 % of the material, respectively. No digital bones were found.

Pig bone remains included mainly valuable body parts (33.3 %) and a similar number of less valuable head parts (30.0 %). 18.6 % of the material was determined as proximal parts of the forelimb and 12.4 % – as proximal parts of the hind limb. Far less represented were less valuable parts of the forelimb and hind limb (1.4 % in both cases), as well as digital bones (2.8 %).

Among the bone remains of small ruminants valuable body parts were most common (29.3 %), then came proximal parts of the forelimb (20.8 %) and hind limb (20.5 %). Fewer remains were identified as less valuable carcase parts, such as head bones (16.5 %), distal parts of the forelimb and hind limb (3.6 % and 6.1 %, respectively) and digital bones (3.2 %).

Horse bone remains were dominated by body parts, which constituted 43.8 % of the material. Then came proximal parts of the forelimb (20.8 %) and head remains

(14.6 %). There were few other anatomical elements (less than 10.0 %).

The age analysis revealed that 2.2 % of cattle remains belonged to young animals. The age of two mature individuals was established: one of them lived for 3.5 - 5 years and the other was more than 10 years old. The percentage of sheep and goat slaughtered young was higher and equalled 10.1 %. However, the highest percentage of slaughtered young individuals concerned pig remains: 17.1 %. Two horse bone fragments were identified as belonging to immature individuals while two tooth fragments belonged probably to one mature animal. There was also one fang of an old individual.

The sex of three goats was reconstructed on the basis of three horn core fragments. One piece belonged to a very young male and the remaining two to females, one of them being *intersex*. Among the pig bone remains there were two male fangs and one female fang. One horse fang was also identified, which means that the animal must have been male.

Two cattle bone remains were measured and calculated into points. The measurements gave 20 and 28 points out of 100 (**Table 7**). These data indicate small cattle, most probably of the *Bos taurus brachyceros* type. The thickness of *substantia compacta* and the massiveness of other bones suggest that some of the fragments belonged to the primigenious cattle.

One sheep astragalus was measured. The withers height of this individual was 59 centimetres. One metatarsal bone belonging to a horse helped to establish its withers height. It was 146 centimetres and corresponded to 72 points. From the appearance of the bones it can be inferred that horses were of different build: from medium-sized to big.

The zoological analysis of domestic animal bone remains from Kazackaya Hill was compared with the material from other places used by the soldiers of the Lower Moesian army, i.e. a temple in Balaclava and three locations at Novae (**Table 8**). On Jackal's Hill sheep and goat remains were dominant (59.1 %), pig came second (21.1 %), while cattle was even less common (14.0 %). The smallest percentage of bones concerned horse (4.8 %) and dog (1.0 %). In Balaclava sheep and goat bones also prevailed (64.5 %) but they were followed by cattle (29.1 %) and only then pig (4.0 %). There were few horse and dog remains (1.4 and 0.9 %, respectively).

The zoological distribution of the remains from three different sectors at Novae differed among themselves and was also different from the material found on the Crimean Peninsula. The bone remains found at Novae and dated to the 1st century AD were dominated by cattle bone fragments (55.1 %). 28.2 % of the remains belonged to pig, and there were very few remains of small ruminants (9.7 %). The percentage of horse bone fragments was quite high (6.5 %) while dog remains were least common (0.5 %).

In the material dating back to the turn of the 2nd and 3rd centuries AD the biggest number of remains (49.5 %) was identified as belonging to pig. Cattle bone fragments constituted 27.8 % of the material and small ruminant remains: 21.8 %. The percentage of horse and dog remains was very low. The zoological distribution differed in the material from sectors of the site dating from the 4th century AD, where sheep and goat remains and pig remains were prevalent (40.1 % and 35.6 %, respectively). They were followed by cattle, constituting 23.5 % of the remains. Only 0.2 % of the bones were identified as horse remains and there were no dog bones.

This comparative analysis shows that the zoological distribution of the osteological material from Kazackaya Hill was most similar to the distribution determined for the material from Novae dated to the 4th century AD.

Bone marks

The bone remains from Kazackaya Hill bear various traces, not only of the anthropogenic origin but also made after the bones had been thrown away. The anthropogenic marks include traces of the pre-consumption treatment and the consumption itself, as well as marks connected with production.

Traces of the pre-consumption treatment were connected with meat jointing, preparation for eating and consumption. Meat jointing comprises flaying, splitting and chopping. Flaying means skinning an animal – in order to do this the skin must be incised on the head and distal parts of the limbs. Traces of this process were found on a goat horn core fragment which had been chopped off the cranium.

After flaying, the carcase was divided into pieces by splitting and chopping. Traces of these processes were observed on various long bones, as well as scapulae and vertebrae belonging to cattle, sheep, goat, pig and horse.

The preparation for eating meant filleting, that is separating meat from the bones. This process results in numerous cuts on the bones which were found mainly on the bone remains of small ruminants. Sometimes meat with bones underwent heat treatment, mostly roasting and cooking. Black singe marks indicate roasting, whereas grey and porous light bones suggest cooking. Both types of traces were numerous and concerned various bones of both domestic and wild animals.

The consumption of roasted or cooked meat was connected with new filleting traces. Many cuts were found especially on rib remains, but also on scapulae of various domestic species.

Marks connected with production were found only on one rib fragment belonging to a young horse. The rib was sawn through with the aim of producing a tool of unidentified purpose.

Other marks present on the bones from Kazackaya Hill were made after the bones had been thrown away. They include bite marks made by dogs, which were observed

on sheep and goat metacarpal, humeral and radial bones, as well as on a pig femoral bone. Marks made by plant roots were found on radial and humeral bone fragments belonging to pig.

Discussion

Meat eaten by the soldiers at the sentry post on Kazackaya Hill came mostly from domestic animals. Their meat diet was only slightly supplemented by meat from wild animals, birds, fish and invertebrates. Molluscs constituted about 9.0 % of all the bone remains. They were concentrated in the courtyard, probably because the shells had been thrown away there directly after the consumption. The molluscs remains belonged mainly to *Unio sp.* and oyster; snail remains were less common. Molluscs were an important source of protein and vitamins. They may have been imported to Kazackaya Hill from the nearby Inkerman Bay. However, their source cannot be determined with absolute certainty, as there is no archaeozoological research from similar sites[2].

The low percentage of fish remains (0.5 %) suggests that fish did not play an important part in the soldiers' diet. However, they could have been imported without heads and vertebrae: smoked, salted or – which is even more probable – in form of garum, i.e. a sauce from fermented fish that was very popular among the Romans. This possibility is supported by archaeological evidence from Chersonesos, where over a hundred containers for fermenting fish have been found so far. The vast majority of them is dated to the Roman period.

The percentage of bird remains was low and did not exceed 2.0%. Several bone fragments were identified typically; they all belonged to hen. They were probably the remains of hens bred on the spot as the source of eggs and meat.

Only 1.0 % of the osteological material was classified as belonging to wild animals. The presence of roe deer, gazelle and fallow deer was confirmed. Roman soldiers were officially banned from hunting (DAVIS 1971) for security reasons. The sentry post was about eight kilometres away from the permanent quarters in Balaclava-Kadykovka and there were probably no more than 6-8 soldiers there.

The meat from breeding animals was fundamental in the meat consumption of the Roman soldiers from Kazackaya post. It is impossible to determine whether the animals were bred on the spot or their meat was imported. The data concerning the region of northern Switzerland indicate that the appearance of Roman troops led to the increase in number of farms geared towards providing the soldiers with food (EBERSBACH, SCHRÖDER 1997: 450). A similar system functioned probably in the rural area of Chersonesos. It is also possible that the supplies were brought from the main military base when the manning of the watchtower changed. Some of the mammal remains belonged to the animals bred on the spot. They were live meat reserve in case of danger and were also kept for their useful features.

Among breeding animals, sheep and goats were most common, but the latter prevailed. They were followed by pig. The smallest number of remains belonged to cattle, not counting horse and dog. The dominance of small ruminants could be the result of their great adaptability to difficult environmental conditions and easy breeding combined with the possibility of obtaining milk, wool and skin. These animals require neither good or spacious grazing lands nor any particular care. According to Kolumella (VII, 6, 1; translated by M. Mikołajczyk), goat "prefers the land covered with thorny bushes rather than open plains; it grazes best in inaccessible and forested places. For it does not shun thorny bushes or thorns and it likes small trees and bushes most".

Similarly to small ruminants, pig is easy to breed. Pigs are omnivorous, they can be kept locked up and fed leftovers or grazed in the forest or a meadow. What is more, pig is an excellent source of meat and fat. Moreover, it can litter twice a year and each litter consists of 8 to 15 young, which gain weight quickly (LASOTA-MOSKALEWSKA 1997: 200). All these features help to obtain a big amount of meat in quite a short time.

The low percentage of cattle bone remains can be attributed to the unfavourable breeding conditions. Cattle require spacious grazing lands with easy access to water, most preferably in the flatlands. Roman writers stated that cattle should be provided with specially prepared barns (COLUMELLA I, 6, 4; PALLADIUS I, 21). The sentry post was only about 750 m^2 big and this space did not permit more than 2-3 pieces of cattle to be kept at the same time.

The domestic animal remains contained also a few fragments which belonged to horse and dog. Horse bone remains are present on almost all sites from the Roman period, especially military ones. Dog might have been used as guard dogs, alerting people to danger, or as sheepdogs.

The anatomical distribution of cattle remains does not include horn cores or digital bones. It means that

[2] Seafood is known to have been valued by Roman soldiers. They happened to import it from far afield, as it was the case with the legion camp at Vindonissa in present Switzerland, where oysters were imported from the Portuguese coast and the English Channel (DAVIS 1971: 129).

slaughtering took place outside the post, provided that the animals were bred on the post. There is a lot of archaeological evidence which shows that animals were usually slaughtered close to their breeding place. Access to running water was very important, as all the waste was thrown away there. Slaughtering and meat jointing of the cattle from Kazackaya post could have taken place near one of the springs located several hundred metres to two kilometres away from the post (SARNOWSKI, SAVELJA, KARASIEWICZ SZCZYPIORSKI 2002). It is possible that near these springs the animals were slaughtered and flayed and then valuable parts and the head were cleaned, prepared for further processing and taken to the camp, while other less attractive parts were left there. There is also a possibility that meat was brought to the post from outside; the slaughtering may have then taken place on the farms responsible for sup-plying the army with food. At the present stage of the research it is impossible to determine the place of breeding. The evidence weighs in favour of outside breeding, since head, body parts and proximal parts of the forelimb and hind limb were dominant, while distal parts of the forelimb and hind limb were far less common. It may suggest that the meat suppliers were obliged to deliver only the best carcase and head parts, as they were probably the greatest delicacy.

The analysis of the anatomical distribution of sheep, goat and pig bone remains indicates that all skeleton elements were represented, together with digital bones. It suggests that these animals were at least occasionally slaughtered on the spot, presumably when some outside threat prevented the soldiers from leaving the post. These species are easier to slaughter than cattle, as their slaughtering is less complicated and can be done with little water, especially in times of emergency. However, it seems that majority of the remains belonging to sheep, goat and pig came from the animals slaughtered outside the post.

The age reconstruction showed that the highest percentage of slaughtered young animal remains (almost 20 %) belonged to pig. The data concerning numerous European sites prove that young pigs were slaughtered there more often than at Kazackaya post, as the percentage of slaughtered young pigs ranged between 30 and 35 % (LASOTA-MOSKALEWSKA 1997). It may indicate that on the Crimean Peninsula pigs were kept not only for meat but also in order to obtain fat. Unfortunately, the lack of data from other sites in this region makes it impossible to determine, whether the breeding procedure at Kazackaya post was exceptional or whether it was characteristic for the local economy in the Roman period.

As for small ruminants, the percentage of slaughtered young individuals was about 10 %, while at most European sites it does not exceed 5 %. The fact that the percentage of slaughtered young sheep and goats at Kazackaya post was so high indicates that small ruminant breeding was mainly meat-oriented, but they were also kept for their milk, wool and skin.

Small percentage of slaughtered young animals was observed among cattle (about 2 %). It suggests making use of the living mature individuals as a source of milk and probably as draught animals transporting water or other supplies. It cannot be determined whether cattle were bred on the spot. If we assume that cattle breeding took place on farms, the animals could have been used for ploughing. It is possible that in the Roman period there was an increase in cereal crops on the Herakleian Peninsula (KARASIEWICZ-SZCZYPIORSKI 2003: 143). Cattle were definitely the source of milk which was consumed by soldiers, either unprocessed or converted into cheese. In this case slaughtering young cows would not be profitable.

Among the horse bone remains only three fragments belonged to young individuals. It implies that useful features of living animals were mainly used; horses were probably good means of transport. It is possible that horse meat was occasionally eaten, which is confirmed by traces of chopping found on some bones belonging to horse. Further confirmation of this idea comes from the archaeozoological analyses carried out for other sites from the Roman provinces, e.g. Tongeren in Belgium (ERVYNCK, SCHRÖDER 1997: 461), Nikopolis in Bulgaria (BEECH 1997: 626), Künzing Quintana (SWEGAT 1976: 106) or Hüfingen in Germany (SAUER-NEUBERT 1969: 6).

It is possible that horse osteological material from Kazackaya site belonged to animals kept by the soldiers at the post and slaughtered for meat in time of some emergency, when no other food was available. They may also have been brought from outside the post, probably by people responsible for meat supplies. It cannot be determined whether horse meat was eaten by the soldiers or by the local people assigned to help at the post.

The morphological analysis showed that the slaughtered cattle differed in size. There were small and big individuals, since they belonged to two different morphological types: the *Bos taurus brachyceros* type and the aurochs-type. The latter is present on almost all sites from the Roman period in Italy as well as in Roman provinces, including Moesia, where the troops stationed on Crimea came from. The primigenious cattle seems to have been brought from Lower Moesia by the legionaries whereas the small cattle was probably of local origin. Unfortunately, poor condition of the material made it unable to determine whether there were any staging form remains which would indicate cross-breeding of these two types of cattle.

One sheep withers height was calculated and it was about 59 centimetres. It means that it was a small sheep of the mouflon-type (LASOTA-MOSKALEWSKA, KOBRYŃ, ŚNIEŻYŃSKI 1998). The material did not include horn cores which may suggest hornlessness of the sheep at Kazackaya post.

A comparative zoological analysis of domestic mammal remains from the two possible using phases at the site shows that there were surplus cattle bones in the first phase. In the second phase the percentage of cattle remains

diminished, while the percentage of remains belonging to small ruminants increased. At present stage of the research it is difficult to point out the reasons for these changes. However, the above-mentioned differences may help to distinguish two chronological phases of settling the post on Kazackaya Hill.

A comparative zoological analysis was also carried out for domestic mammal remains from Kazackaya post and the sites in Balaclava and Novae. It revealed that the diet of their inhabitants differed considerably due to numerous factors, mainly the geographical and climatic conditions, as well as the various nature of the compared sites.

The osteological material from Kazackaya post and the temple in Balaclava was dominated by sheep and goat remains, but the distribution of other species differed on both sites. On Kazackaya Hill pig remains came second while in Balaclava small ruminants were followed by cattle, whereas the percentage of pig remains was low and oscillated around 4 %. This difference is probably caused by the sacred nature of the Balaclava site. It was a temple and sheep and cattle are known to have been the most important sacrificial animals for the Romans (TOYNBEE 1973: 152, 164).

The comparison of animal bone remains from the Kazackaya Hill and three different locations at Novae dated at the 1st century AD, the turn of the 2nd and 3rd centuries AD and the 4th century AD also revealed different zoological distribution. These data may imply that the Roman soldiers did not have one particular dietary pattern but rather made use of different local possibilities. They did not pay particular attention to the choice of meat for consumption and ate anything that was available at a particular place and time. It is also confirmed by the archeozoological material from the Roman period obtained from towns as well as civil and military settlements located in different parts of Europe. The meat diet was mainly influenced by geographical and climatic factors and to a less extent by the nature of the site (ERVYNCK, VANDERHOEVEN 1997; BOESSNECK 1958; BENECKE 1994).

Conclusion

The meat eaten by the Roman soldiers at Kazackaya post at the turn of the 2nd and 3rd centuries AD came mainly from domestic animals: sheep and goats, but also pig, cattle and probably horse. Some of the small ruminants, pigs and cattle were bred on the spot or in the immediate vicinity of the post, while the rest of meat was obtained from outside, presumably from local farms or main military headquarters. The dominance of sheep, goats and pigs was probably due to the fact that they could be easily bred, even in difficult conditions.

The soldiers' meat diet was also supplemented with wild animals including roe deer fallow deer and gazelle. They ate some molluscs, such as the molluscs of the *Unio sp.*, oysters and snails, as well as birds and fish.

The comparative analysis of the osteological material from Kazackaya Hill with the bone remains found in Balaclava and Novae shows that Roman soldiers did not have any particular breeding or consumptional pattern but they rather made use of various local possibilities.

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Table 1. Animal bone remains from Kazackaya site

Species	Tower	Room A	Room A1	Room B	Room C1	Room C2	Room D	Room E	Room F	Room G	Room H	Room I	Courtyard	Wall	Ditch	Total
Cattle	47				3	3	8	1	2	1			47	6	21	139
Pig	25	2	11	9	5	7	5	3	5	7	3	7	100	1	20	210
Sheep/goat	97	4	18	11	16	9	49	17	21	10	2	7	207	15	35	518
Sheep	3			1		1							16	1	4	26
Goat	14						3		3				17	1	4	42
Horse	10						1		1	5			20	2	9	48
Dog						2	1				1		5			9
Big ruminant	2									2						4
Small ruminant	7			1			2						5			15
Gazelle								1								1
Roe deer								1					3			4
Fallow deer	1															1
Wild boar	2															2
Hare													2			2
Micromammal	1		1												1	3
Rodent	1															1
Hen	1			1			1		2				1			6
Bird	4			2	1				1		1		4			13
Fish													1		1	2
Oyster			2	2	1	1				1			10			17
Mollusc of the Unio sp.	1		1	1		1				1		1	66		1	73
Snail								3					5			8
Total	216	6	33	28	26	24	70	26	35	27	7	15	509	26	96	1144
Unidentified	168	7	16	6	10	6	27	4	15	5	1	6	226	2	72	571

Table 2. Species distribution of the animal bone remains from Kazackaya site

Zoological identification	n	%
Cattle	139	14.0
Pig	210	21.2
Sheep/goat	586	59.1
(sheep	26	
goat)	42	
Horse	48	4.7
Dog	9	1.0
Domestic animals (total)	992	100
Gazelle	1	
Roe deer	4	
Fallow deer	1	
Wild boar	2	
Hare	2	
Wild and hunting animals (total)	10	
Micromammal	3	
Rodent	1	
Bird	19	
(hen)	6	
Fish	2	
Invertebrate	98	
mollusc of the Unio sp.	73	
oyster	17	
snail	8	

Table 3. Animal bone remains from the tower. courtyard and buildings on Kazackaya site

Zoological identification	Tower		Buildings		Courtyard	
	n	%	n	%	n	%
Cattle	47	24.0	6	2.4	47	11.4
Pig	25	12.7	64	25.3	100	24.3
Sheep/goat	114	58.2	172	68.0	240	58.3
Horse	10	5.1	7	2.8	20	4.8
Dog	–	–	4	1.5	5	1.2
Domestic animals (total)	196	100	253	100	412	100
Wild and hunting animals	3		2		5	
Bird	5		9		5	
Fish	–		–		1	
Invertebrate	1		15		81	

Table 4. Animal bone remains from Kazackaya site in the distinguished chronological phases

Zoological identification	Phase I		Phase II		Phase I/II	
	n	%	n	%	n	%
Cattle	58	16.9	40	10.6	3	(6.8)
Pig	85	24.8	74	19.6	7	(15.9)
Sheep/goat	186	54.2	243	64.5	31	(70.5)
Horse	13	3.8	17	4.5	1	(2.3)
Dog	1	0.3	3	0.8	2	(4.5)
Domestic animals (total)	343	100	377	100	44	100
Wild and hunting animals	3		3		3	
Bird	11		4		0	
Fish	0		1		0	
Invertebrate	64		25		1	

Table 5. Homogeneity analysis for domestic animal remains from the two using phases on Kazackaya site (Chi-square = 9.68>7.815; with $\alpha\alpha$=0.05 and v=3)

Zoological identification		Phase I	Phase II	Total
Cattle	F f f-F	58 47 +11	40 51 –11	98
Pig	F f f-F	85 77 +8	77 85 –8	162
Sheep/goat	F f f-F	186 204 –18	243 225 +18	429
Horse	F f f-F	13 14 –1	17 16 +1	30
Total		342	377	719

Table 6. Anatomical distribution of domestic animal remains from Kazackaya site

Osteological characteristics	Cattle		Pig		Sheep/goat		Horse	
	n	%	n	%	n	%	n	%
Head	26	18.7	63	30.0	96	16.5	7	(14.6)
Trunk	81	58.3	70	33.3	172	29.3	21	(43.8)
Proximal part of the forelimb	15	10.8	39	18.6	122	20.8	10	(20.8)
Distal part of the forelimb	1	0.7	3	1.4	21	3.6	2	(4.2)
Proximal part of the hind limb	12	8.6	26	12.4	120	20.5	4	(8.3)
Distal part of the hind limb	4	2.9	3	1.4	36	6.1	4	(8.3)
Digital bones	–	–	6	2.8	19	3.2	–	–
Total	139	100	210	100	586	100	48	100

Table 7. Measurements of animal bones from Kazackaya site

Species	Osteological characteristics	Type of measurement	Mm	Points
Cattle	Astragalus	greatest lateral length	57	28
		greatest length of the dorsal part of the calcaneum	52	
		greatest breadth of the proximal part	37	
	Calcaneum	greatest length	108	20
Goat	Scapula	smallest length of the callum scapula	20	
		greatest length of the scapula articular processus	30	
		length of the glenoidal cavity of the scapula	19	
		breadth of the glenoidal cavity of the scapula	20	
Sheep	Astragalus	greatest lateral length	26	
		greatest length of the dorsal part of the calcaneum	25	
		greatest breadth of the proximal part	17	
Pig	Digital bone II	greatest length	24	
Horse	Metetarsal bone	greatest length	282	72
		lateral length	274	
		greatest breadth of the proximal part	53	
		greatest breadth of the distal part	54	
		smallest breadth of the shaft	35	

Table 8. Distribution of the domestic animal remains on the sites occupied by soldiers of the Lower Moesian army

Species	Kazackaya		Balaclava		Novae (1st c AD)		Novae (2nd/3rd c AD)		Novae (4th c AD)	
	n	%	n	%	n	%	n	%	n	%
Cattle	139	14.0	101	29.1	119	55.1	60	27.3	108	23.5
Pig	210	21.2	14	4.0	61	28.2	107	48.6	164	35.6
Sheep/goat	586	59.1	224	64.6	21	9.7	47	21.4	187	40.7
Horse	48	4.7	5	1.4	14	6.5	2	0.9	1	0.2
Dog	9	1.0	3	0.9	1	0.5	4	1.8	–	–
Total	992	100	347	100	216	100	220	100	460	100

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Мясной рацион питаниа римских солдат с поста на высоте Казацкая около Инкермана (Севастополь, Украина)

Резюме

Римский военный пост на высоте Казацкая (**Fig. 1**) открыт случайно в 1991 году. В 2000-2002 гг. были начаты его систематические исследования совместной экспедицией Национального заповедника «Херсонес Таврический» (Севастополь) и Института Археологии Варшавского университета (Варшава).

Результаты исследования показали, что пост существовал во 2-ой половине II - 1-ой половине III вв. н.э. К сожалению, отсутствует материал, позволяющий датировать памятник археологии более точно. В некоторых помещениях (A1, B, C1, D), а также в башне и во дворе удалось выделить два периода существования постройки. Археологический материал, обнаруженный на указанных участках, в том числе и костные остатки животных были последовательно отобраны.

Первоначальный период существования на первом этаже башни прослеживается как тонкий слой утоптанного пепла, в котором находились единичные фрагменты черепицы (**Fig. 3**). На полу данного периода, вдоль западной стены помещения позднее был уложен ряд крупных камней, которые, скорее всего, служили лавкой.

В помещении A1 замечено, что основание западной стены находится выше фундаментов соседних стен (**Fig. 2**). Под фундаментом указанной стены имеется слой стерильной глины, и только под ним – дневная поверхность первого периода жизнедеятельности строения. Как и в башне, эта поверхность прослеживается благодаря утоптанному пеплу. Лишенный находок слой глины, скорее всего, образовался в результате разрушения первоначальных стен помещений. На такую возможность указывают контуры отдельных блоков (кирпичей?) из сырой глины, что было замечено во время исследования глинистых отложений в помещении B. Если наше наблюдение является верным, в таком случае уложенные из камня нижние участки стен в помещениях, окружающих двор, выполняли бы функцию фундаментов. По-видимому, выше стены были сооружены из глины. Объясняло бы это как происхождение слоя чистой глины, так и факт отсутствия завалов камней разрушенных стен. Сооруженные выше более поздние стены помещений возведены на слое снивелированной глины из уничтоженных стен первоначальной застройки. Под слоем нивеляции находился глинобитный пол.

На посту Казацкая найдено 1715 фрагментов костей, из которых идентифицировано, с точки зрения видового и анатомического состава – 1144 (66.7 %; **Table 1**). Преобладают кости млекопитающих (89.5 %), меньше костей птиц (1.7 %) и рыб (0.2 %). Остатки молюсков составляют 8.6 % (**Table 2**). Млекопитающие были представлены главным образом домашними животными (99.0 %), дикие животные – немногочисленны, среди них можно выделить кости серны, кабана, зайца, газели и оленя. Среди домашних млекопитающих больше половины составляют кости овцы и козы (59.1 %), на втором месте – свиньи (21.2 %), а затем – крупнорогатого скота (14.0 %), коня (4.5 %) и собаки (0.9 %).

Таким образом, основой мясной диеты обитателей поста были домашние животные, однако, не известно разводили их на месте или откуда-нибудь доставляли. Преобладание мелких жвачных животных и свиньи объясняется тем, что эти породы были легки в содержании. Млекопитающие, на которых охотились, и безпозвоночные в виде моллюсков и устриц, а также улитки являлись только дополнением в рационе питания, в то же время мясо птиц, среди которых выделены кости домашних кур, не играло почти никакой роли. С другой стороны, отсутствие значительного количества костей птиц можно объяснить их плохой сохранностью. Незначительное присутствие остатков рыб также, по-видимому, не соответствует фактической роли в диете пребывавших в Крыму римских солдат. Археологические свидетельства из Херсонеса, в том числе более ста цистерн, предназначенных для переработки рыбы, позволяют предположить, что поставки на высоту Казацкая рыбной продукции осуществлялись в форме лишенных костей продуктов переработки. В пределах поста количество костей отдельных видов было различным (**Table 3**). Также отличаются и каждый из двух периодов существования поста (**Table 4, 5**). Со временем возрастает удел мелких жвачных животных и уменьшается доля костей свиней и крупного рогатого скота. Анатомический анализ крупного рогатого скота показывает, что отсутствуют фрагменты выростка лобной кости, на которой крепятся рога, а также фалангов пальцев. Это означает, что убой этих животных, если их разводили на месте, осуществлялся вне пределов поста. Если же мясо животных поступало извне,

то, без сомнения, была произведена предварительная селекция, основанная на выборе наиболее ценных в кулинарном смысле частей. В то же время представлены все элементы скелетов овцы, козы и свиньи, что свидетельствует об осуществлении убоя животных на месте, по крайней мере, спорадически (**Table 6**).

Среди костей крупного рогатого скота 2.2 % относится к молодым особям, среди костей овец и коз – 10.1 %, а среди свиней – 17.1 %. Приведенные выше наблюдения свидетельствуют, что свиней разводили с целью получения не только мяса, но также и сала, в то время мелких жвачных животных, главным образом, из-за мяса, а крупный рогатый скот использовали как тягловую силу и источник молока. Крупный рогатый скот формой был близок туру, встречаются низкорослые типа *Bos taurus brachyceros*, присутствуют также высокие особи типа *Bos primigenius* (**Table 7**). Не найдено форм промежуточных, свидетельствующих о скрещивании обоих типов. Овцы представлены мелкой формой близкой муфлону, высотой в холке 59 см. Лошади отличаются значительным ростом – около 150 см и мощным сложением корпуса.

При сравнении остатков домашних животных с поста на высоте Казацкая и другими пунктами, где пребывали римские солдаты, то есть в Балаклаве и в Ново, следует, что видовой состав был достаточно различным (**Table 8**). Причиной, правдоподобно, могли служить многие факторы, и прежде всего, климатическо-географический. Большое значение имел и характер поселения. То есть диета солдат была приспособлена к локальным возможностям в месте их проживания.

Перевод с польского Л. А. Ковалевская-Сарновска

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Pożywienie mięsne żołnierzy rzymskich z posterunku Na Wzgórzu Kazackaja, koło Inkermanu (Sewastopol, Ukraina)

Streszczenie

Rzymski posterunek wojskowy na Wzgórzu Kazackaja (**Fig. 1**) został odkryty przypadkowo w 1991 r. W latach 2000-2002 systematyczne badania na tym stanowisku prowadziła wspólna ekspedycja Muzeum Narodowego „Chersonez Taurydzki" w Sewastopolu i Instytutu Archeologii UW.

Wyniki badań pozwalają datować posterunek na 2. połowę II w. i 1. połowę III w. n.e. Niestety podczas wykopalisk nie ujawniono materiału, który umożliwiłby precyzyjniejsze datowanie. W niektórych pomieszczeniach (A1, B, C1, D), a także we wnętrzu wieży i na dziedzińcu, udało się wyróżnić dwie fazy budowlane. Znaleziska ruchome, w tym kości zwierzęce, były na tych odcinkach przyporządkowywane do jednej z faz.

Pierwotny poziom użytkowy w zachowanej części wieży rysuje się jako cienka warstwa rozdeptanego popiołu (**Fig. 3**). W jej stropie znajdowały się pojedyncze fragmenty dachówek. Dopiero później (powyżej) wzdłuż zachodniej ściany wieży ułożono kamienie, które przypuszczalnie tworzyły ławę.

W pomieszczeniu A1 ściana zachodnia została wzniesiona z wyższego poziomu niż południowa (starsza?) ściana tego pomieszczenia (**Fig. 2**). Poniżej stopy fundamentu ściany zachodniej znajduje się warstwa sterylnej gliny, a dopiero pod nią pierwotny poziom użytkowy. Tak jak w wieży, jest on czytelny dzięki popiołowi rozdeptanemu na klepisku. Pozbawiona znalezisk warstwa czystej gliny, zalegająca powyżej, powstała najprawdopodobniej w wyniku zawalenia się ścian pomieszczeń z pierwszej fazy. Na taką możliwość wskazują czytelne w warstwie gliny kontury oddzielnych bloków (cegieł ?) z surowej gliny, które zaobserwowano podczas eksploracji w pomieszczeniu B. Można przypuszczać, iż zachowane pozostałości kamiennych ścian to faktycznie fundamenty, na których wznoszono właściwe, gliniane ściany, a całość pokryto dachem z materiałów organicznych. Wyjaśniałoby to pochodzenie warstwy czystej gliny, a także brak zasypiska, które powinno pozostać po budowlach wzniesionych z kamienia. Późniejsze ściany pomieszczeń powstawały na warstwie gliny pochodzącej ze zniszczonych, wcześniejszych zabudowań.

Podczas badań wydobyto łącznie 1715 fragmentów kostnych, z czego pod względem gatunkowym i anatomicznym zidentyfikowano 1144 sztuki, co stanowi 66.7 %. Wśród zidentyfikowanych pozostałości kostnych dominowały szczątki ssaków (89.5 %), a zdecydowanie mniej liczne były szczątki zwierząt należących do innych gromad:

ptaków (1.7 %), ryb (0.2 %) i mięczaków (8.6 %) (**Table 2**).

Ssaki reprezentowane były głównie przez zwierzęta udomowione (99.0 %), do dzikich należał tylko 1.0 % szczątków. Udało się zidentyfikować m.in. kości dzika, zająca, gazeli i jelenia. Wśród gatunków domowych ponad połowę stanowiły kości owcy i kozy (59.1 %), na drugim miejscu była świnia (21.2 %), dalej bydło (14.0 %). Na kolejnych miejscach występowały szczątki konia (4.5 %) i psa (0.9 %).

W diecie mieszkańców posterunku dominowało mięso zwierząt domowych, nie można jednak stwierdzić jednoznacznie, jak wiele zwierząt mogło być hodowanych na miejscu, a ile mięsa przywożono. Dominacja szczątków drobnych przeżuwaczy i świni jest zrozumiała, są to gatunki łatwiejsze w utrzymaniu. Ssaki dzikie oraz bezkręgowce stanowiły tylko uzupełnienie diety, a mięso ptactwa, w tym kury domowej, nie odgrywało niemal żadnej roli. Niedobór szczątków drobiu, a także ryb, można jednak tłumaczyć ich mniejszą trwałością. Nieliczne występowanie właśnie tych szczątków prawdopodobnie nie odpowiada faktycznej roli w diecie żołnierzy rzymskich stacjonujących na Krymie. Wyniki wykopalisk w Chersonezie, w tym przede wszystkim ponad stu znanych zbiorników służących do przetwarzania ryb, mogą wskazywać, że te ostatnie najprawdopodobniej trafiały na wzgórze Kazackaja w formie pozbawionych ości przetworów.

Skład szczątków kostnych pochodzących z wieży, pomieszczeń gospodarczych i dziedzińca pod wieloma względami różnił się (**Table 3**). Porównanie składu gatunkowego zbiorów kości z dwóch wyróżnionych faz chronologicznych także wykazało zróżnicowanie (**Table 4 i 5**). W fazie drugiej wzrasta udział małych przeżuwaczy, a maleje odsetek szczątków świni i bydła.

Z analizy rozkładu anatomicznego szczątków bydła wynika, że brakowało fragmentów możdżeni i członów palcowych. Oznacza to, że ubój tych zwierząt (przy założeniu, że były one hodowane na miejscu), odbywał się poza terenem posterunku. Jeśli natomiast mięso specjalnie sprowadzano, to niewątpliwie dostarczano wyselekcjonowane, bardziej wartościowe części tuszy. Tymczasem szczątki kostne owcy, kozy i świni reprezentują wszystkie części szkieletu, co wskazuje, że uboju osobników należących do tych gatunków, przynajmniej czasami, dokonywano na miejscu (**Table 6**).

Wśród kości bydła 2,2 % należało do zwierząt młodych, wśród kości owiec i kóz ten odsetek wynosił 10.1 %, a w przypadku szczątków świń – 17.1 %. Powyższe obserwacje wskazują, że świnie hodowano nie tylko dla mięsa, ale także w celu uzyskania słoniny, drobne przeżuwacze – głównie dla mięsa, a bydło – jako zwierzęta pociągowe oraz dla mleka. Bydło było budową zbliżone do tura. Występują zarówno osobniki niskorosłe typu *Bos taurus brachyceros*, jak i wysokie *Bos primigenius* (**Table 7**). Nie stwierdzono form pośrednich, świadczących o krzyżowaniu się obu typów. Owce należały do formy drobnej, zbliżonej do muflona, osiągały do 59 cm w kłębie. Konie charakteryzowały się znaczną wysokością – około 150 cm – i silną budową ciała.

Porównanie wyników analizy archeozoologicznej materiałów ze wzgórza Kazackaja oraz z innych miejsc stacjonowania wojsk rzymskich (Bałakława, Novae) pozwala stwierdzić, że dieta mięsna na wymienionych stanowiskach znacznie się różniła (**Table 8**). Przyczyny takiego stanu rzeczy mogły być różne. Wydaje się, że przede wszystkim dieta była dostosowana do możliwości zaopatrzenia w danym miejscu.

PLATE 130

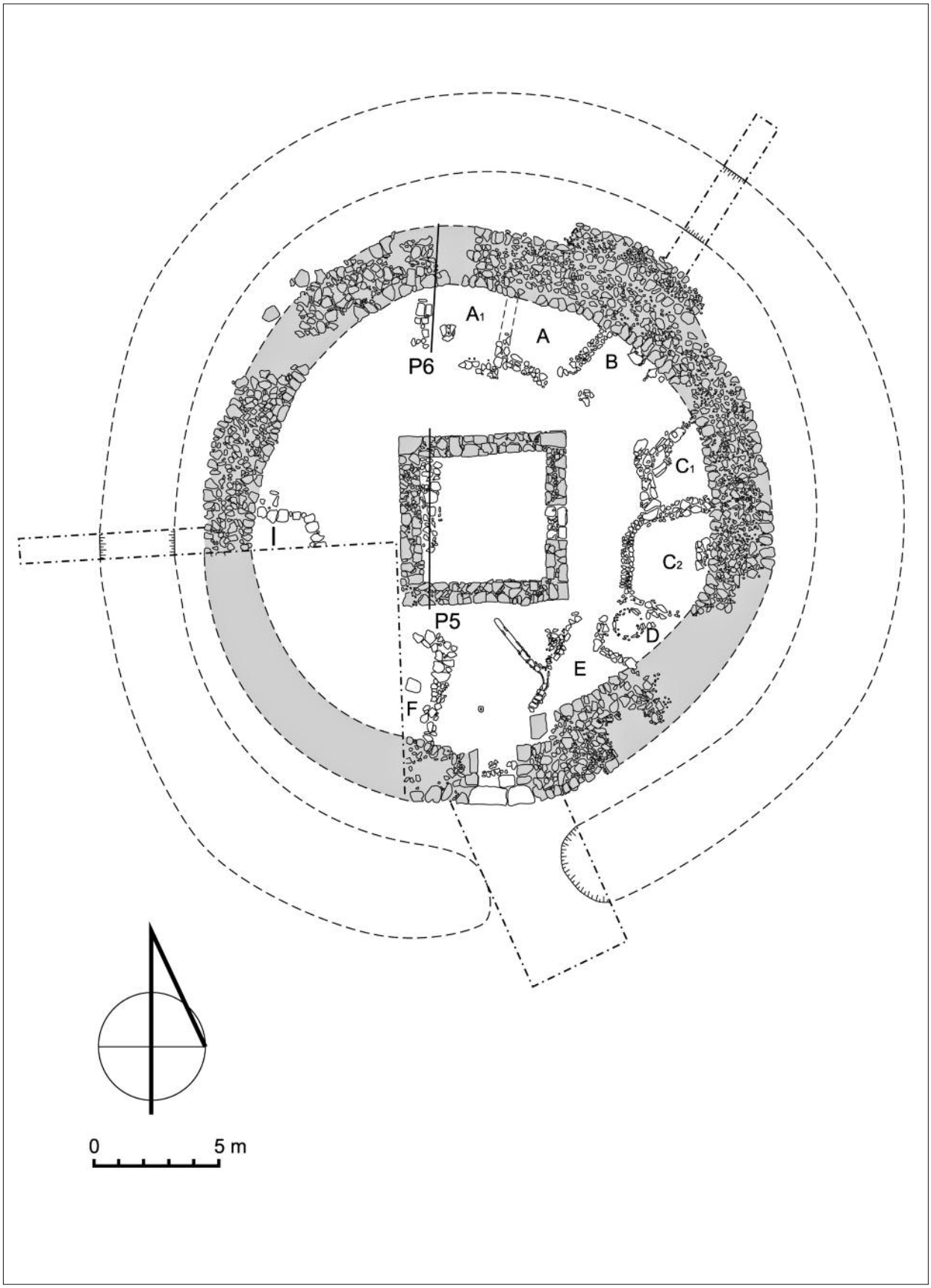

Fig. 1. Kazatskaya Hill, the Roman watchtower – general plan after the completion of excavations (M. Wagner). P5 and P6 – sections depicted in Figs. 2 and 3

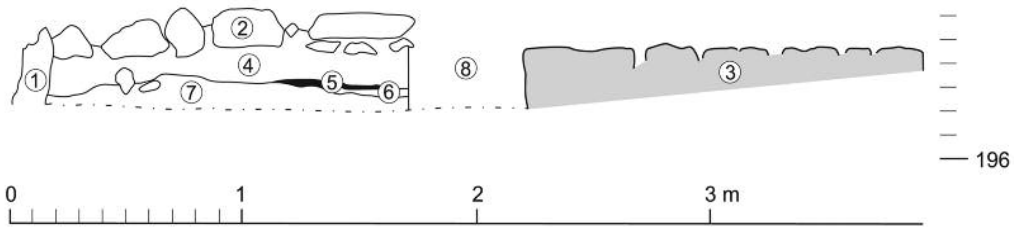

Fig. 2. Section P6 – cut through Room A1 and the circumferential masonry wall of the fortlet. View from the east (M. Wagner); 1 – southern wall of Room A1; 2 – western wall of Room A1; 3 – circumferential masonry wall of the fortlet; 4 – layer of pure clay; 5 and 6 – layer of ash and burnt clay (remains of a hearth); 7 – undisturbed subsoil; 8 – Modern period cut;

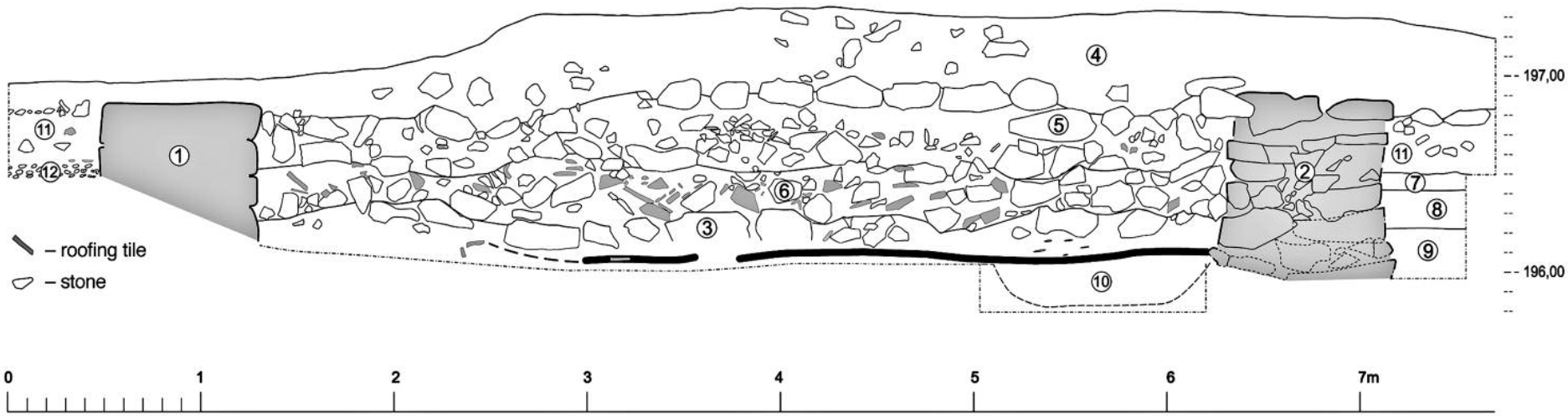

Fig. 3. Section P5 – cut through the interior of the watchtower. View from the west (M. Wagner); 1 – northern wall of the tower; 2 – southern wall of the tower; 3 – layer of flat stones covering the surface with traces of burning and tiny fragments of burnt roofing tiles (with the original usage level below?); 4 – present-day topsoil; 5 – layer consist ing mainly of stone rubble; 6 – layer consisting of small pebbles and broken roofing tiles; 7 – layer containing small chips of stone (building layer); 8 – ballast (levelling layer); 9 – layer of the original topsoil (before the tower was constructed); 10 – cut under the floor in the interior of the tower; 11 – layer of clay and stone rubble (fill in the inner ward); 12 – layer of small pebbles (original usage level in the inner ward)