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The Teleac Hillfort in Southwestern Transylvania: the Role of the Settlement, War and the Destruction of the Fortification System

Geophysical prospection and excavations show that the heavily fortified Teleac hillfort was densely occupied with a population reaching the low thousands. In this article it is argued that Teleac was a local political centre that acted as a hub for transportation and trade in a region that is rich in mineral resources. Recent investigations also reveal that Teleac was attacked in the late 10th century in an event that breached and destroyed the formidable northern defensive system. This attack suggests that the level of military threat was quite severe in the eastern Carpathian Basin. The attacking forces must have had significant offensive capabilities in order to tackle Teleac's defences. It is also a strong indication that not only Teleac, but contemporary fortified settlements in the surrounding region were at least in part erected to resist serious military threats.

Introduction

With a fortified area encompassing 30 ha, Teleac is the largest Late Bronze Age and Early Iron Age hillfort in south-western Transylvania. The oldest occupation belongs to the mid-11th century Gáva culture and the end of occupation in the 9th century has Basarabi culture material. Recent investigations show that Teleac was densely inhabited with an estimated population of about 1200 persons, and that the settlement was spatially well organised with some areas set aside for large-scale, high temperature production. The immediately surrounding territory had 15 contemporary, open Gáva culture settlements with a population of approximately 2700 persons.[1] Teleac is of course not the only fortified Gáva settlement in Transylvania and neighbouring regions, but it is worth noting that there is a distance to other contemporary fortified sites, which makes it likely that Teleac was a dominant settlement in at least the immediate surrounding territory (**Fig. 1**). Another intriguing aspect is that Teleac's northern defences were destroyed during an attack, which provides new information regarding the scale and organisation of warfare during the 10th century in the eastern Carpathian Basin.

Teleac's sheer size and the fact that 30 % of the territory's population lived there, coupled with the attack on hillfort's impressive fortification system, raises the question as to the role that the settlement played in a local and regional context. In this paper we try to approach this general question by examining some key aspects of the hillfort: the makeup and defensive value of Teleac's fortification system, the internal structure and organisation of the settlement, Teleac's location in connection to natural resources and transportation routes, and the hillforts relationship with open settlements and the surrounding region. Against this background, we also attempt to explain possible reasons behind the attack of Teleac and to explore aspects of 10th century BC warfare.

Teleac's settlement structure and defences

Teleac occupies a prominent position on the western rim of the Secașelor Plateau, overlooking the Mureș River Valley. The hillfort's southern boundary is delimited by a sharp ridge that faces a small valley that joins the Mureș floodplain on the south-western side of the site (**Fig. 2**). Teleac's western side, directly in front of the Mureș Valley, is damaged by erosion, but judging from the topography, it is likely that this part of the settlement had a steep drop towards the river. The

[1] Uhnér *et al.* 2017, 192-195.

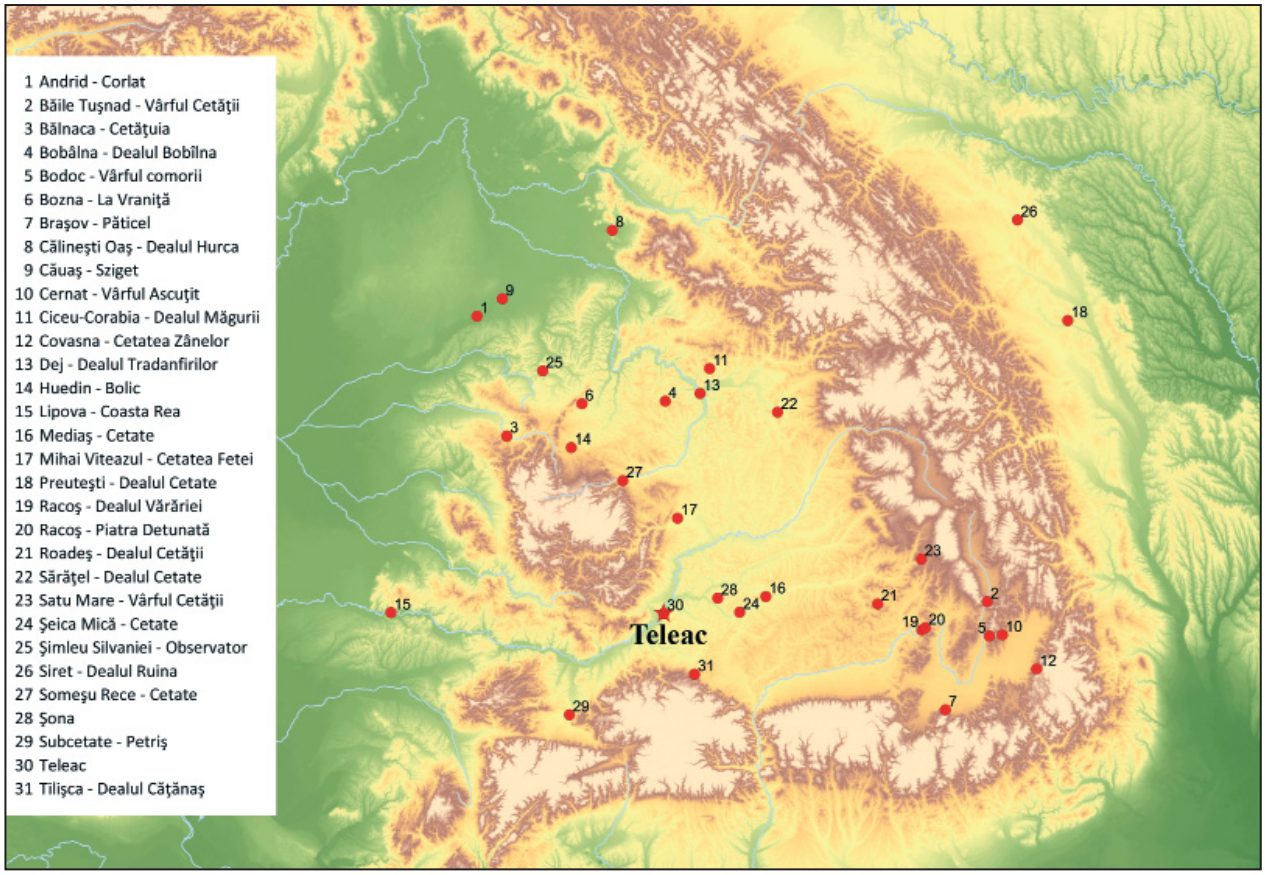

Fig. 1 Location of the Teleac hillfort and fortified Gáva settlements in the larger region surrounding Teleac (map by the authors)

only part of the site that was easily accessible from the outside was the gently sloping north-eastern perimeter leading into the Secașelor Plateau, but here the settlement was protected by a more than 800-m long, wooden framed box-rampart filled with earth and two outer ditches connecting the naturally well defended southern ridge with the steep north-western part of the site.

Much of what we know about Teleac's internal settlement structure is based on geophysical prospection of the site, and the general nature of the anomalies on the magnetogram has been verified by excavations at key locations on the Gruşet Plateau and in the Lower Settlement. Although one cannot determine with certainty to which occupation level anomalies on the magnetogram belong, excavations show that there is good correlation between the geophysics and a roughly contemporary stratigraphic level with classical Gáva features throughout the settlement.[2] Later Gáva and Basarabi culture features in the upper 50 cm of cultural layers tend to be very badly preserved and usually not recorded on the magnetogram, and the magnetometer does not penetrate deep enough to record the earliest features in Teleac. With the caveat that later features sometimes disturb the picture, and that it cannot be ruled out that some significantly earlier features also may be recorded on the magnetogram, it is at least possible to understand aspects of the organisation of habitation and activities in Teleac.

Jidovar Hill

The Teleac hillfort's interior has several distinct parts, distinguished both by the local topography and partly by various types of occupation and areas for specific production activities (**Fig. 3**). Jidovar Hill makes up the hillfort's eastern part and was the first fortified section of the hillfort.[3] The hill covers an area of about 3 ha and consists of three narrow terraces sandwiched between the large and gently sloping lower hillside and a small flat plateau just below the hilltop. Jidovar is the highest part of the site and offers an impressive view of vast sec-

[2] Cf. Uhnér 2017, 206; Uhnér *et al.* in press Fig. 6.

[3] Ciugudean 2012b, 107. 112-113.

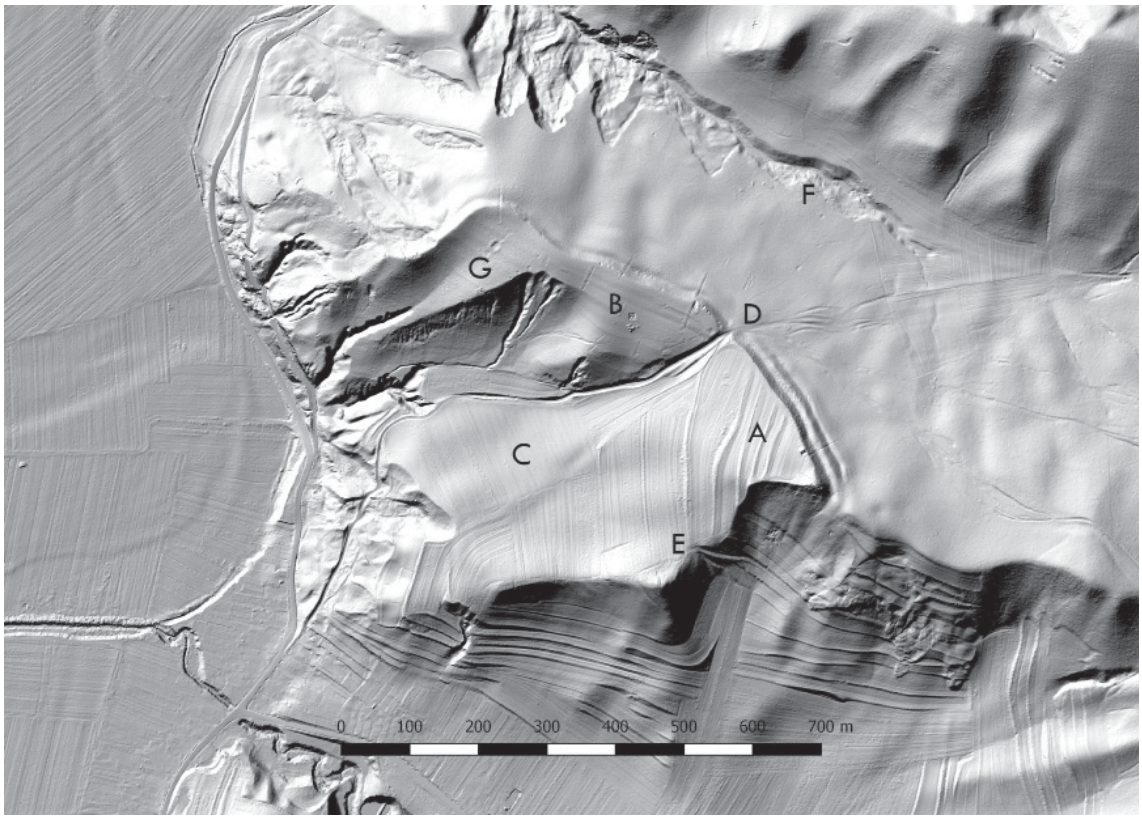

Fig. 2 LiDAR image of the Teleac hillfort. **A** Jidovar Hill; **B** Gruşet Plateau; **C** Lower Settlement; **D** Northern fortification and gate; **E** Southern Ridge and gate; **F** Areas north of the settlement; **G** North-western part of the settlement (image by the autors)

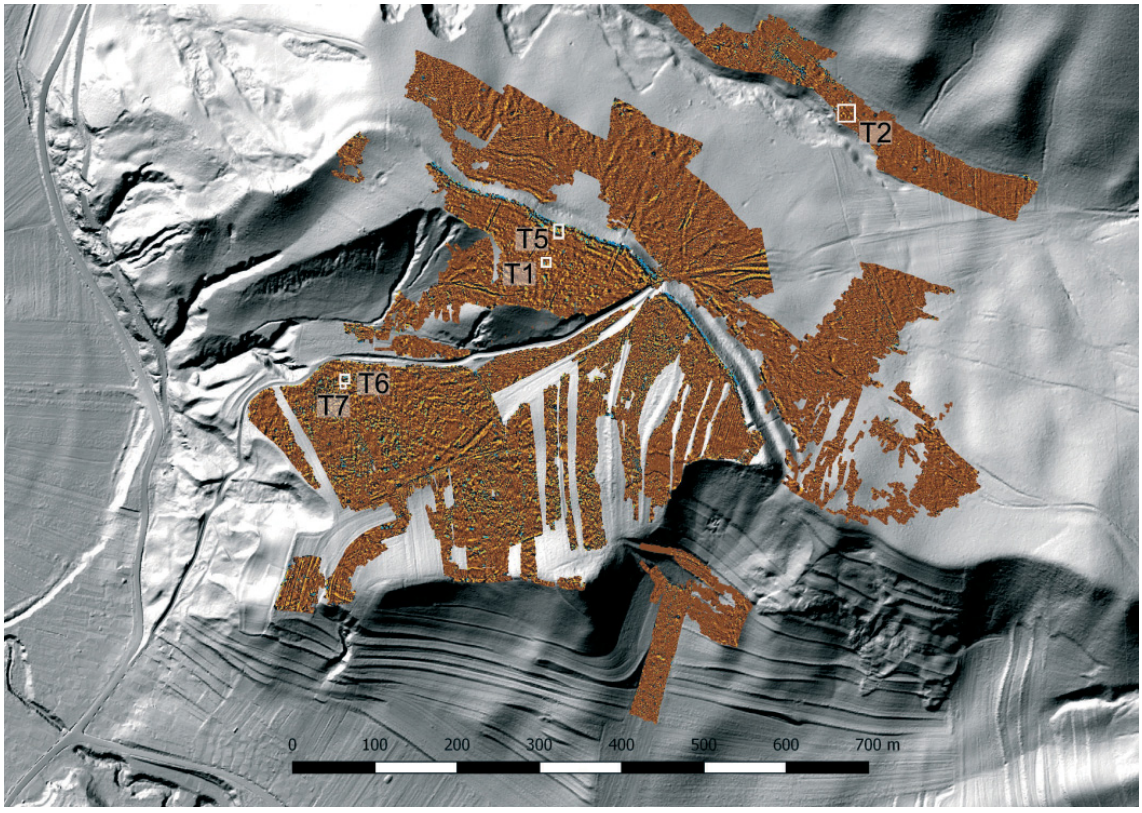

Fig. 3 Magnetogram superimposed on a LiDAR image of the Teleac hillfort. The locations of the main trenches excavated in 2016 and 2017 are outlined in white (magnetogram by J. Kalmbach, RGK)

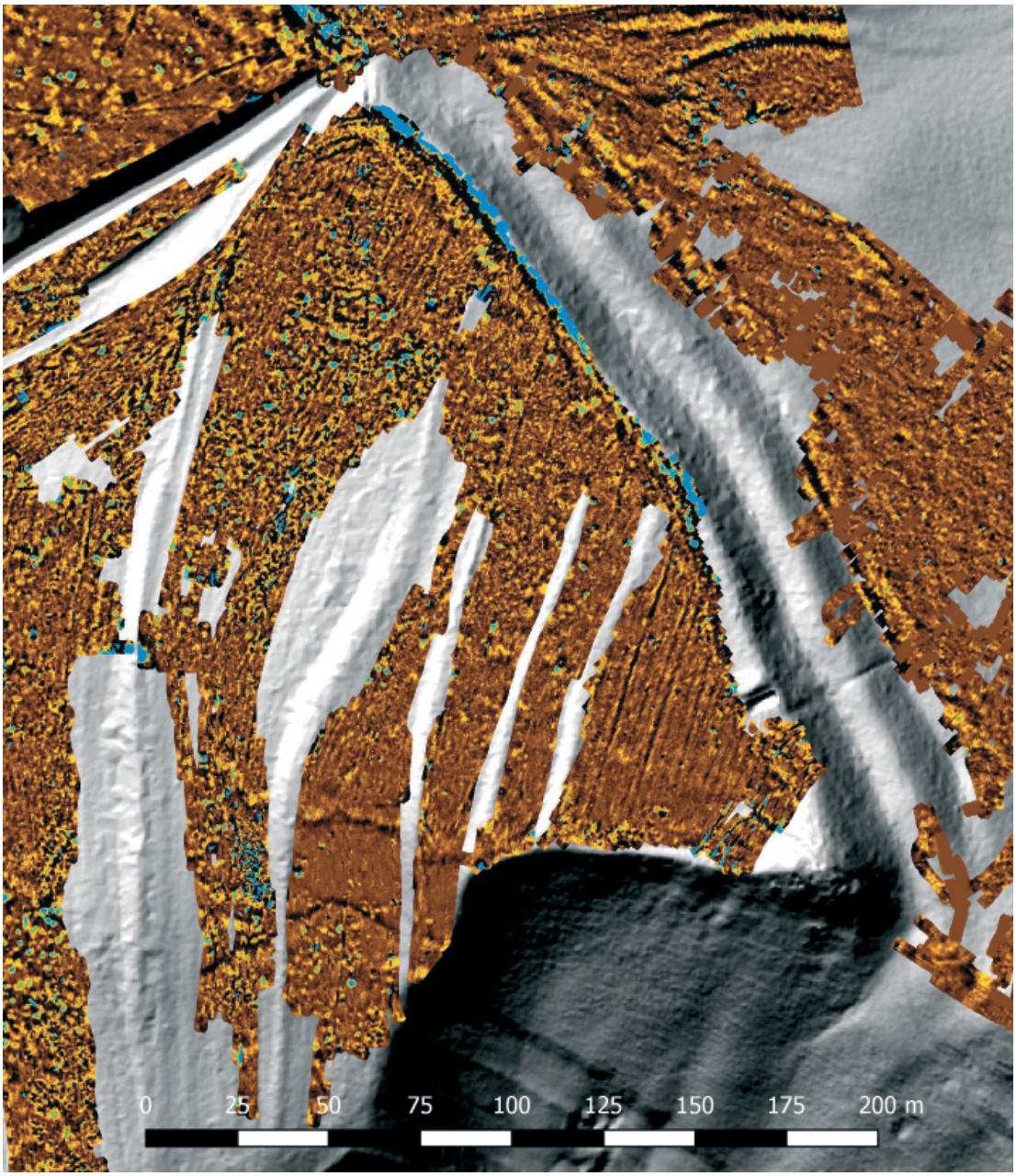

Fig. 4 Magnetogram superimposed on a LiDAR image of Jidovar Hill (magnetogram by J. Kalmbach, RGK)

tions of the surrounding landscape. It has a double ditch and a rampart along the north-eastern hillside that links up with a smaller rampart that follows the bottom of the hill to the gate area at the southern ridge. The steep top of the hill is manmade and resembles a tower. It is built up by an earth-filled wooden box construction similar to the rampart. It appears that Jidovar hill formed a separate enclosed section of the hillfort after the enlargement of the fortification system to include the other parts of the hillfort.[4]

Recent excavations and geophysical prospection indicate that the lower part of Jidovar Hill and a c. 40-m wide and 90-m long section along the inner rampart were densely occupied, whereas the southern parts of the upper terraces have fewer anomalies and their number decreases with distance from the rampart (**Fig. 4**).[5] The small plateau just below the hilltop has very few magnetic anomalies, which is peculiar as the plateau offers a good, albeit somewhat weather exposed position for occupation. A possible explanation for this condition may be that the plateau has been

[4] Ciugudean 2012b, 107; Uhnér 2017, 206.

[5] Uhnér 2017, 206; Uhnér *et al.* 2018.

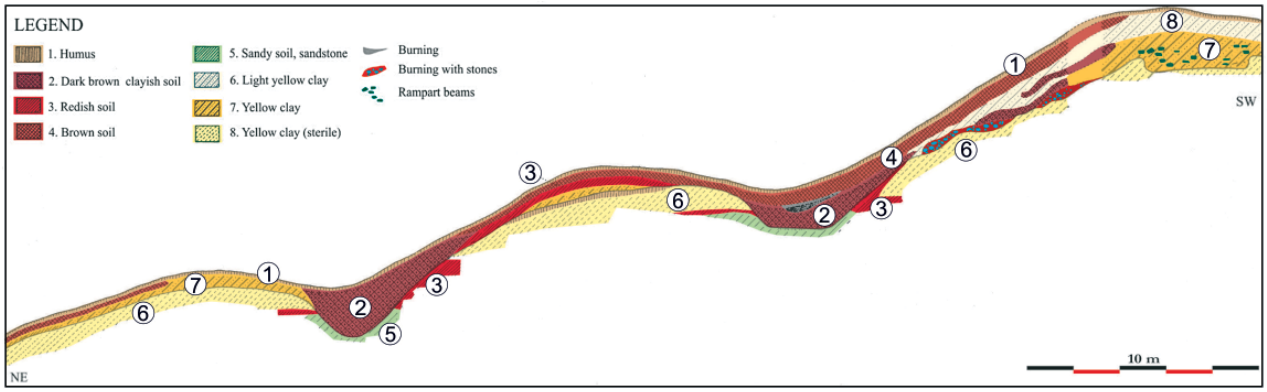

Fig. 5 Section of the northern fortification system at Jidovar Hill, showing the rampart and defensive ditches (adapted from Horedt *et al.* 1962, 3 Fig. 3)

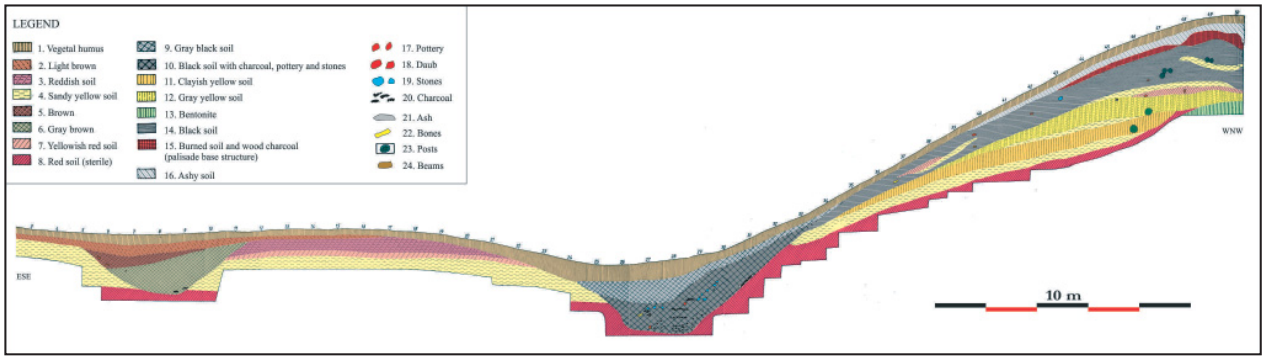

Fig. 6 Section of the northern fortification system at Jidovar Hill, showing the tower and defensive ditches (adapted from Vasiliev *et al.* 1991, 28 Pl. III)

covered by erosion from the hilltop[6] and that the magnetometer hence does not penetrate to the depth where archaeological features are found. That said, soil cores taken with a push probe show that large parts of the area have cultural layers less than a meter deep, and the poor preservation of features in the upper layers at Teleac may therefore account for the lack of anomalies.

It is tempting to describe Jidovar Hill as an acropolis or a citadel, but this has to be done with some caveats.[7] The hill is indeed the upper part of the settlement as is fitting for an acropolis and the area is heavily fortified. The steep and towering southern part of the hill offers excellent natural protection and the north-eastern hillside has a substantial rampart, which is further strengthened by two outer ditches (**Fig. 5**). It is unclear whether the area between the outer ditches had a palisade and formed an outer fortification. However, this seems likely from a functional standpoint, as an attacker had to breach two defensive lines, and because without an ancillary palisade the outer ditch would be counterproductive in the defence of Teleac, as it could provide an amount of cover from projectiles fired by the defenders from the inner rampart. The only part of Jidovar Hill that did not offer a significant height advantage of several meters in relation to areas outside the fortification was the upper part of the hill, where it meets the ridge leading down to the valley south of the hillfort. However, to amend this situation the defences there were strengthened with a wooden framed earthen tower.

Excavations show that the tower had a height of at least 3.5 m that probably was much higher in prehistory, as it is likely that part of the construction is eroded.[8] The defences at the lower hillside facing the hillfort's interior towards the west are much less substantial compared to the outer defences and consist only of an earthen rampart, probably without an outside ditch (**Fig. 6**).[9]

6 Cf. Vasiliev *et al.* 1991, 27 Pl. IV.
7 Ciugudean 2012b, 112-113.
8 Vasiliev *et al.* 1991, 28 Pl. III.
9 Vasiliev *et al.* 1991, 205 Fig. 9; Uhnér 2017, 206.

Jidovar Hill is the strongest fortified area of Teleac and forms a separate part of the fortification to which the population could retreat should the other defences fail. One could hence use the terms 'acropolis' or 'citadel' to describe Jidovar Hill from a defensive standpoint, but it is unclear if other aspects traditionally befitting an acropolis were present. The magnetogram and excavations do not provide any clear indications that the occupants of the hill had a special status, nor of the presence of centralised storage of supplies, or of buildings of an administrative or religious nature.[10] The occupation on Jidovar Hill is similar to adjacent areas in the hillfort in the sense that there appear to be a row of buildings along the inner rampart as on the Gruşet Plateau and that the lower hill section has large amounts of features and anomalies similar to the Lower Settlement. One difference is that fairly large sections on the southern part of the hill are mostly empty of anomalies, whereas other areas inside the hillfort were typically densely occupied or used for production activities that show up on the magnetogram. Judging from what we know of the settlement structure, it seems that Jidovar Hill had what can be characterised as a predominantly normal occupation. Nevertheless, it should be emphasised that recent excavations at the hill only covered the late phase of occupation and that this picture may change. It is also possible that the empty areas on the southern hillside may indicate that only a small section of society was allowed to live on the hill. What supports the latter interpretation is that most other areas inside the hillfort were densely inhabited or used for production activities, and it is therefore difficult to account for that some areas were kept open, or at least were sparsely occupied, if all segments of the population had access to land on the hill.[11]

[10] Uhnér 2017, 206; Uhnér *et al.* 2017, 189-191.

[11] Judging from the topography it is unlikely that the empty areas have been subject to erosion, and it is also unlikely that they were kept open for agriculture or penning animals. Although the gate at the southern ridge is located just below the empty areas, which perhaps would have made it possible to drive livestock directly to Jidovar Hill without passing any occupied areas in the hillfort, it seems implausible that c. 25 % of the best defended part of an otherwise densely built hillfort would have been set aside for animals, although it should be clear that livestock were valuable. Given the large population in Teleac, the empty areas on Jidovar Hill would only suffice for a small part of the settlement's animals.

The Gruşet Plateau

The Gruşet Plateau is located in Teleac's Upper Settlement, north-west of Jidovar Hill. It has flat or mostly gently sloping terrain and covers an area of about 2.5 ha along Teleac's northern fortification system. The earliest Gáva habitation on the plateau was erected before the area was fortified, as is evident by a building that was later covered by the rampart.[12] The magnetogram and recent excavations show clear differences in settlement structure between the area along the fortification system and the southern and central parts of the plateau (**Fig. 7**). Directly adjacent to the inner side of the rampart is a 300-m long section with large anomalies arranged in a fashion that resembles dense habitation, a situation which is similar to the location of buildings in the fortified settlements Andrid-Corlat in north-western Romania,[13] Poroszló-Aponhát and Felsőtárkány-Várhegy[14] in north-eastern Hungary, and Smolenice-Molpír in western Slovakia.[15] Recent excavations in a 10 × 16-m trench (T5) show that the anomalies along the fortification indeed constitute houses: a 9 × 6-m well preserved building was found aligned to the inside of the rampart (**Fig. 3**).[16] The southern part of the Gruşet Plateau appears mainly to have been used for high-temperature production activities. The area has several scattered 2.5 to 4.5-m large anomalies indicative of pit-buildings, which probably were used for economic activities, and a large number of circular anomalies, 1 to 2 m in diameter, which are characteristic of fire installations. Excavation of a 10 × 10-m trench (T1) in the central part of this area have verified the validity of these interpretations with the finds of two pit-buildings and 10 ovens and kilns (**Fig. 3**).[17] Several of the ovens had been renewed or rebuilt in the same location. Given that they were found on several chronological levels, it is clear that the area was used for high-temperature production for a long time.

There is an about 10 to 20-m wide strip of land that is largely empty of habitation type anomalies, which separates the row of buildings by the ram-

[12] Ciugudean 2012b, 113.

[13] Kienlin/Marta 2014, 396–397 Fig. 18.

[14] Szabó 2004, 138–139 Pl. IX; Matuz 1992, 83; Metzner-Nebelsick 2012, 430.

[15] Stegmann-Rajtár 1998, 263–265.

[16] Ciugudean *et al.* 2018.

[17] Ciugudean *et al.* 2017; Uhnér *et al.* 2018.

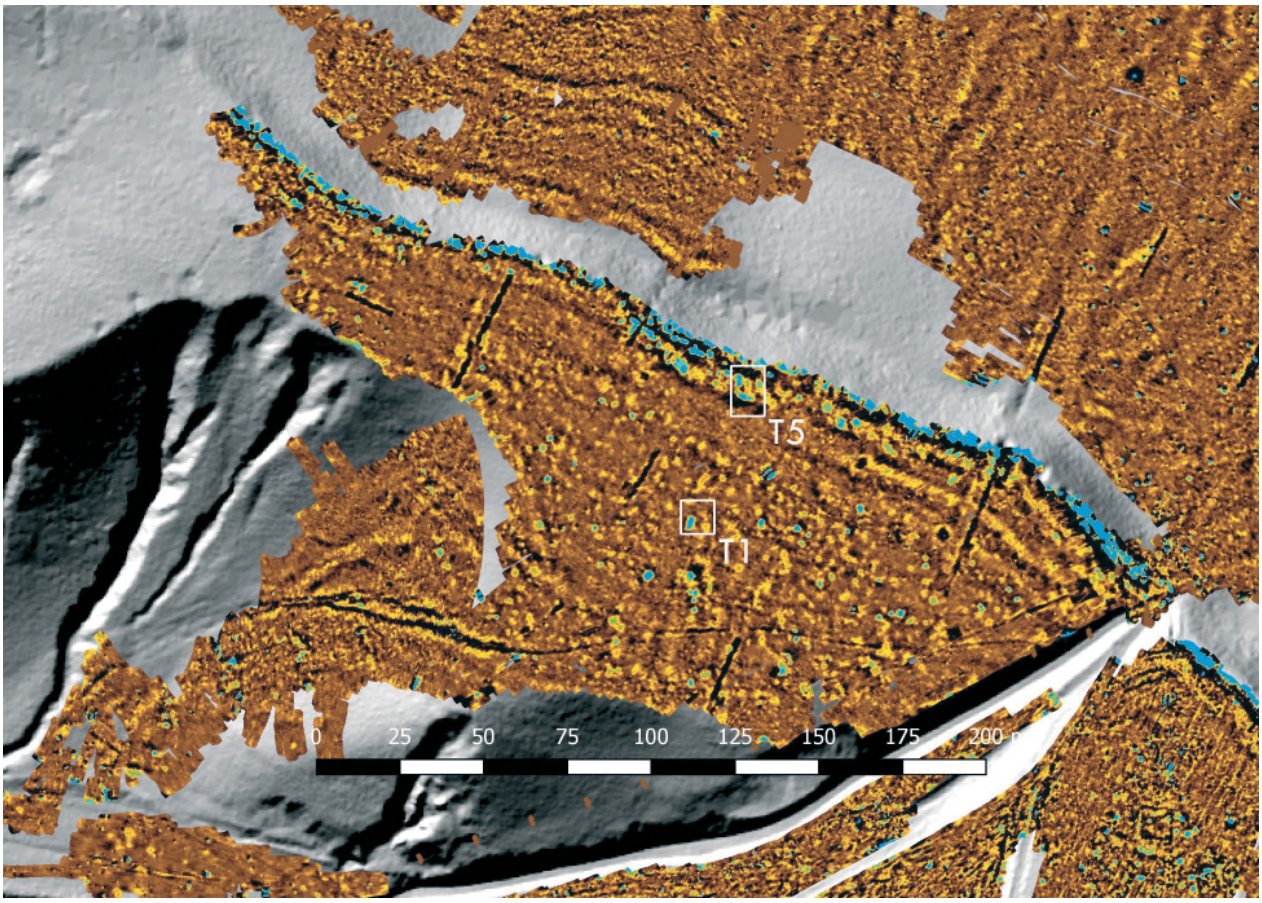

Fig. 7 Magnetogram superimposed on a LiDAR image of the Gruşet Plateau (magnetogram by J. Kalmbach, RGK)

part from the southern part of the Gruşet Plateau (**Fig. 6**). Today, there is not much difference in height between the upper part of the rampart and the settlement plateau, but the LiDAR image and the magnetogram of the settlement, together with recent excavations make evident that the situation was different at the time the hillfort was inhabited. Running parallel to the rampart's inner side are two distinct depressions and one more faint indentation in the terrain, all of which partly show up on the magnetogram as bands with negative nano Tesla values. It seems that these features are linked to the construction of the fortification system. Apparently, it was not sufficient to use soil from the ditch in front of the rampart in order to gain enough advantage in defensive height, so soil was also extracted from inside the hillfort in order to add to the rampart's height.

The 10 × 16-m trench (T 5) in the area provides an indication of the size of these earthworks. At a distance of circa 10 m from the face of the rampart, the ground surface starts to tilt downwards at an angle of about 20 degrees, at least reaching a depth of 1 m relative to the contemporary ground level. The area is at this point not fully excavated, but it appears that a large amount of soil from inside the hillfort was used to construct the rampart. The resulting depression is not as pronounced as the ditch in front of the rampart,[18] and would not have seriously hampered movements inside the hillfort. Nonetheless, it is clear that at least the northern sloping section of the depression was an essentially empty space without archaeological features at this otherwise densely occupied and utilised part of the settlement.

The Gruşet Plateau stands out compared to the other areas in the hillfort, in that apparently a large section was set aside for specialised high-temperature production (**Fig. 8**). Although there are some differences in the settlement structure between various areas in Teleac, most other parts of the hillfort are less organised and have what appears to be mixed habitation and activity areas. This is not to say that all high-temperature production took place on the Gruşet Plateau, as parts of a pottery kiln similar to the one recently excavated on the Gruşet Plateau were found in a

[18] Cf. Vasiliev *et al.* 1991 Pl. II.

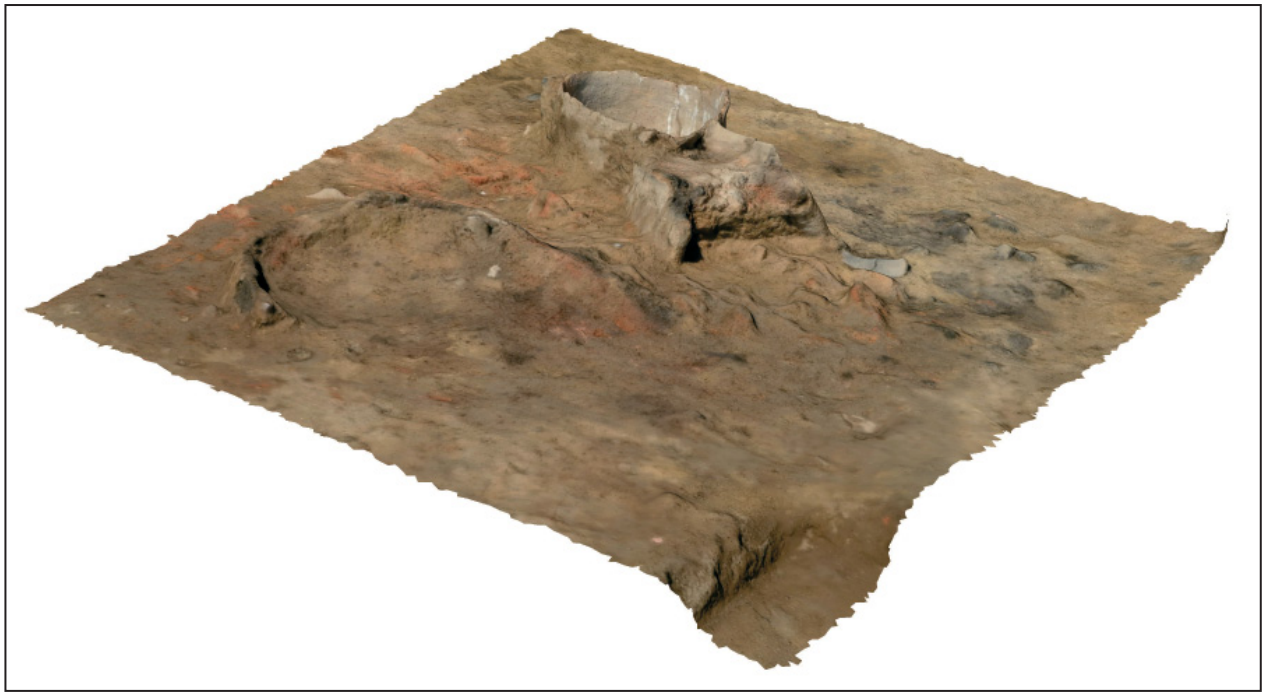

Fig. 8 3D image of a pottery kiln and an adjacent oven found at the area for high-temperature production at the Gruşet Plateau (image by the authors)

building in the Lower Settlement in the 1980s.[19] Nevertheless, concentrating high-temperature production in a largely isolated area the upper part of the settlement is sensible from a utilitarian standpoint, because it reduced the fire hazard and may have provided some benefits of scale.

The northern part of the plateau appears to have had a similar layout as Jidovar Hill with houses hugging the inside of the rampart (**Fig. 9**). To erect buildings directly adjacent to the fortification system was fairly common not only in the Late Bronze Age/Early Iron Age, as demonstrated by both earlier and later European examples.[20] This practice is functional, above all in small fortified settlements, because it is an effective use of the available space and facilitates good communication inside the settlement.[21] Furthermore, the normally sturdy fortification superstructure provides good support for buildings as well as some protection from the weather. Nonetheless, this practice has some drawbacks, particularly from a defensive standpoint. With buildings joining the rampart, in particular if they are positioned close to each other as the situation appears to have been in Teleac, there are limited access points for the defenders to reach positions on top of the rampart. It is however unlikely that this posed a serious problem unless a surprise attack was mounted, and it should be noted that most tall ramparts have only a few places where defenders can climb up to them. A more serious problem was how to protect the buildings. It is impossible to determine with certainty how tall Teleac's rampart was from inside the settlement, but given that the buildings along the rampart were fairly large, it is likely that the rampart was higher than, or at least as high as the roofs of the buildings. When only the layout and part of the walls are preserved, it is of course uncertain how tall the buildings were;[22] however, considering the find of a 150 × 120-cm section of a house wall, and the fact that the roofs were most likely built at an angle, it is probable that the buildings were several meters in height.

Although there has been some erosion, the face of the rampart along the Gruşet Plateau is well preserved and quite steep. There is a difference in height of about 7 m from the top of the partly infilled closest defensive ditch to the top of the rampart; measured from the bottom of the excavated ditch the difference is more than 9 m (**Fig. 10**).[23] As already mentioned, the foundation of Teleac's

[19] Vasiliev *et al.* 1991, 40 ; Uhnér *et al.* 2017, 178-179.
[20] E.g. Näsman 1976; Bátora *et al.* 2012.
[21] Näsman 1976, 76.
[22] Cf. Črešnar 2007, 326-328. 331-333.
[23] Vasiliev *et al.* 1991 Pl. II

Fig. 9 Orthophoto of the 16 × 10-m trench (T5) by the rampart on the Gruşet Plateau with the well preserved remains of a 6 × 9-m large building. The 150 × 120-cm wall section is located in the southern middle part of the building (photo by the authors)

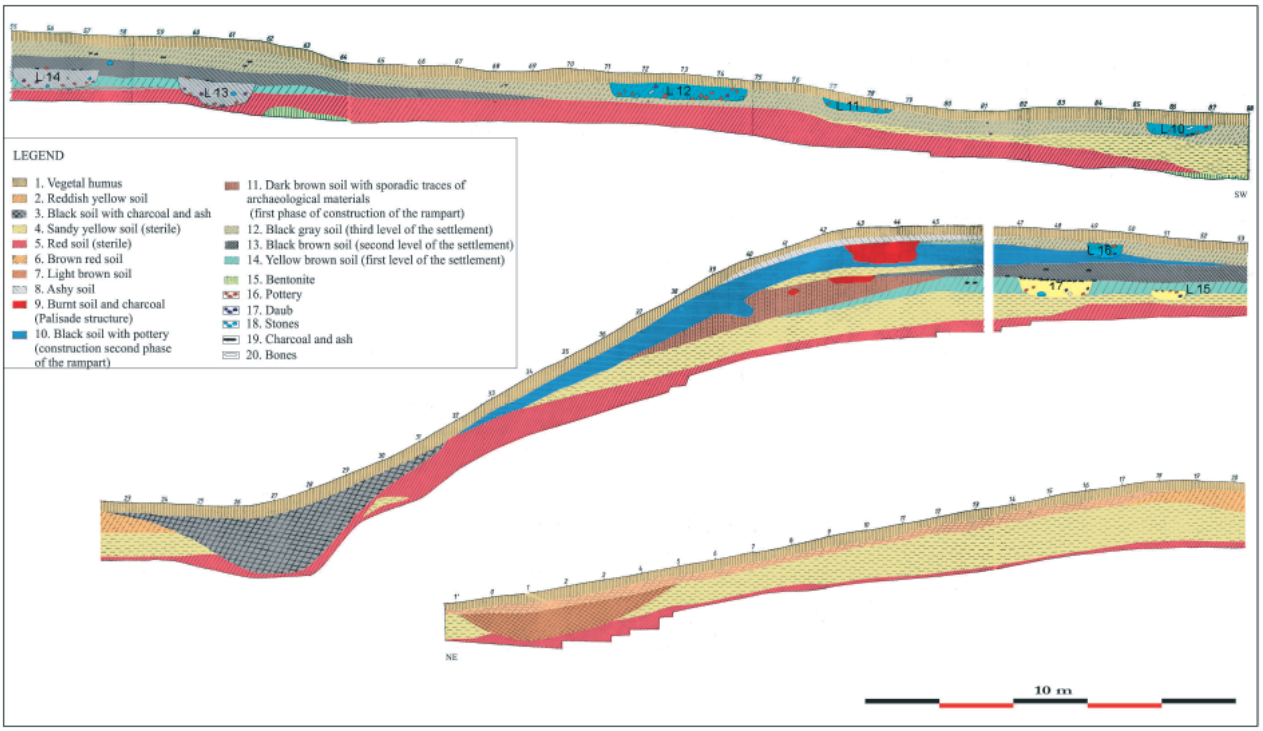

Fig. 10 Section of the northern rampart and defensive ditches at the Gruşet Plateau (adapted from Vasiliev *et al.* 1991, 3 Pl. II)

rampart was composed of wooden-framed boxes filled with earth, and occasionally stones[24] and settlement debris, but it is not clear how the superstructure was built. However, recent excavations provide some clues. Only the rampart's top has been excavated at this point, but it is clear that the construction had a width of about 4 m. Although it is possible that the box-earth structure only made up the lower part of the rampart, the tower on Jidovar Hill shows that the inhabitants in Teleac were able to erect tall self-supporting structures using the same technique. The foundation is wide enough to have supported an at least 2-m high, earth-filled, wooden-framed superstructure;[25] with a parapet extension to protect the defenders on top of the rampart the entire superstructure would have had a height of 3.5 m or more measured from ground level, which perhaps would have been enough to provide cover for the buildings positioned along the rampart. The rampart would then have had a total height approaching 13 m, when viewed from the outside. A previous interpretation of the northern defences in Teleac propose that the top of the rampart had a wooden palisade,[26] which is also a possibility, but it should be noted that recent excavations at the northern rampart have not unearthed any evidence of a palisade.[27]

Although it is impossible to determine with certainty how the rampart's superstructure on the Gruşet Plateau was built, there are a few additional factors that make it likely that it was an earth-filled, wooden-framed box construction of some height. A several decimetres thick layer with debris from the destruction by fire of the rampart and the adjacent building was found during excavation of the 10 × 16-m trench (**Fig. 11**). Even though the building had substantial wattle and daub walls with a thickness of 30 cm, the amount of debris clearly exceeds by a large margin what can be expected from the building. It also seems that the depression south of the fortification system, from which soil for the construction of the rampart was taken, was at least partly filled with debris from the rampart, which effectively altered the appearance of the northern plateau in making the terrain almost flat.

[24] The soil in the Teleac hillfort has very few stones, which means that they have to be brought up from the Mureş Valley below. It is questionable whether the stones had a functional value in the rampart construction, because the soil is very stable. The stones found in the rampart are likely refuse from the settlement.

[25] Cf. Diemer 1995, 28-33.

[26] Vasiliev *et al.* 1991 Pl. IX.

[27] Ciugudean *et al.* 2018.

Fig. 11 Orthophoto of the debris from the destruction of the building and rampart in T5 on the Gruşet Plateau (photo by the authors)

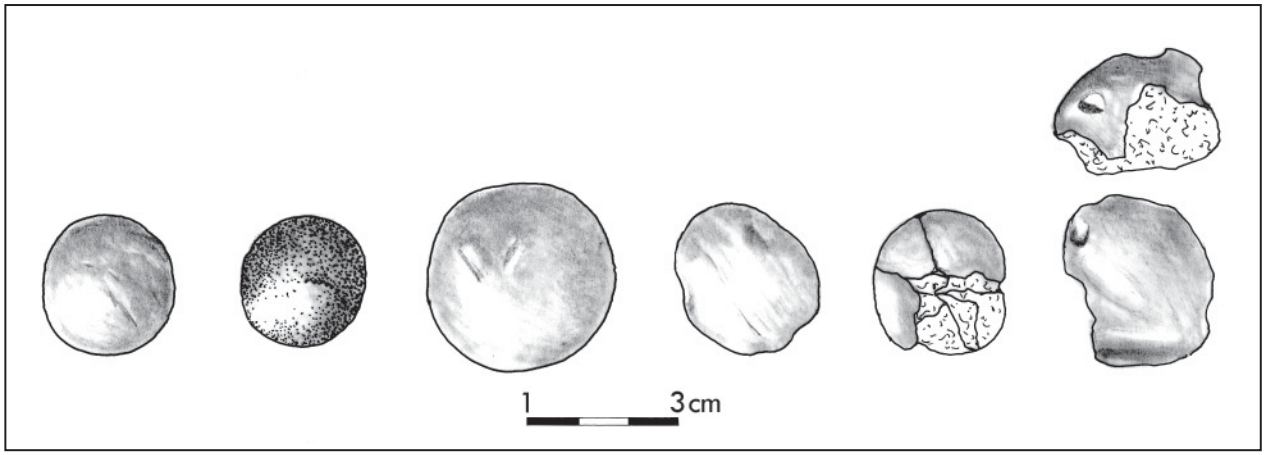

Fig. 12 Small slingshots found in the destruction debris from the northern rampart at Teleac (drawings by F. Mărcuți)

Even if one accepts that the northern rampart's superstructure was tall enough to cover the adjacent buildings, it seems that this practice involved some serious risks. Although we do not know how the buildings' roofs were constructed, it is likely that they were made from turf, thatch, shingles or planks,[28] all of which are combustible materials. It is also documented that the buildings had internal ovens or fire installations. The latter do not pose a serious risk in themselves, as the inhabitants likely had procedures to make this practice as safe as possible. However, given that the buildings were not only positioned very close to the rampart, but apparently also close to each other, a fire in one house could easily have spread to the surrounding buildings and the rampart superstructure, resulting in a conflagration that not only would destroy houses, but also seriously compromise the settlement's defences.

The magnetogram of the northern rampart on the Gruşet Plateau and Jidovar Hill have continuously high nT values between 10 and 30 (**Figs. 3. 4. 7**), indicating that the entire fortification was destroyed by fire in an event that is dated to the late 10th century BC (**Fig. 20**). The extent of destruction makes it unlikely that the fire was an accident, because a concerted effort by the population probably would have succeeded in limiting the damage. More likely explanations are that the rampart was destroyed either on purpose or during an assault on the hillfort. The excavations by the rampart show that valuable portable household goods and supplies, such as 30 loom weights, ceramic storage jars filled with grain and even bronze items were left in one building, which makes a planned destruction unlikely (**Fig. 9**). There is a possibility that the rampart was burned down by attackers after capturing the hillfort, with the aim of either destroying the settlement or at least denying the inhabitants in Teleac the protection and strategic value of having strong fortifications. But even in this case it seems implausible that valuable household goods would have been left inside the building, when the fire was started. The more plausible explanation is that the northern rampart was destroyed during an attack on the hillfort. Supporting this notion is the discovery in the destruction rubble by the rampart of five small slingshots of roughly uniform size and weight and made of clay or stone (**Fig. 12**).[29] Although a hit from such a slingshot would certainly hurt, the blow would not be lethal to or seriously incapacitate a person other than in exceptional cases. Slingshots are however well suited for long distance use to harass and suppress the hillfort's defenders, forcing them to take cover behind the parapet, and thus protecting enemy troops and facilitating direct assaults to breach the defences.

The Lower Settlement

Teleac's Lower Settlement lies in a large basin in the southern part of the hillfort. It covers an area of about 10 ha with a mostly gently sloping terrain that is well suited for habitation. The magnetogram shows that it was densely settled (**Fig. 13**). The situation resembles closely the lower section at Jidovar Hill with numerous anomalies indicative of fire installations and concentrations of wat-

[28] Cf. Črešnar 2007, 331-333.

[29] The slingshots have diameters between 2.5 and 3 cm and weigh between 15 and 20 g.

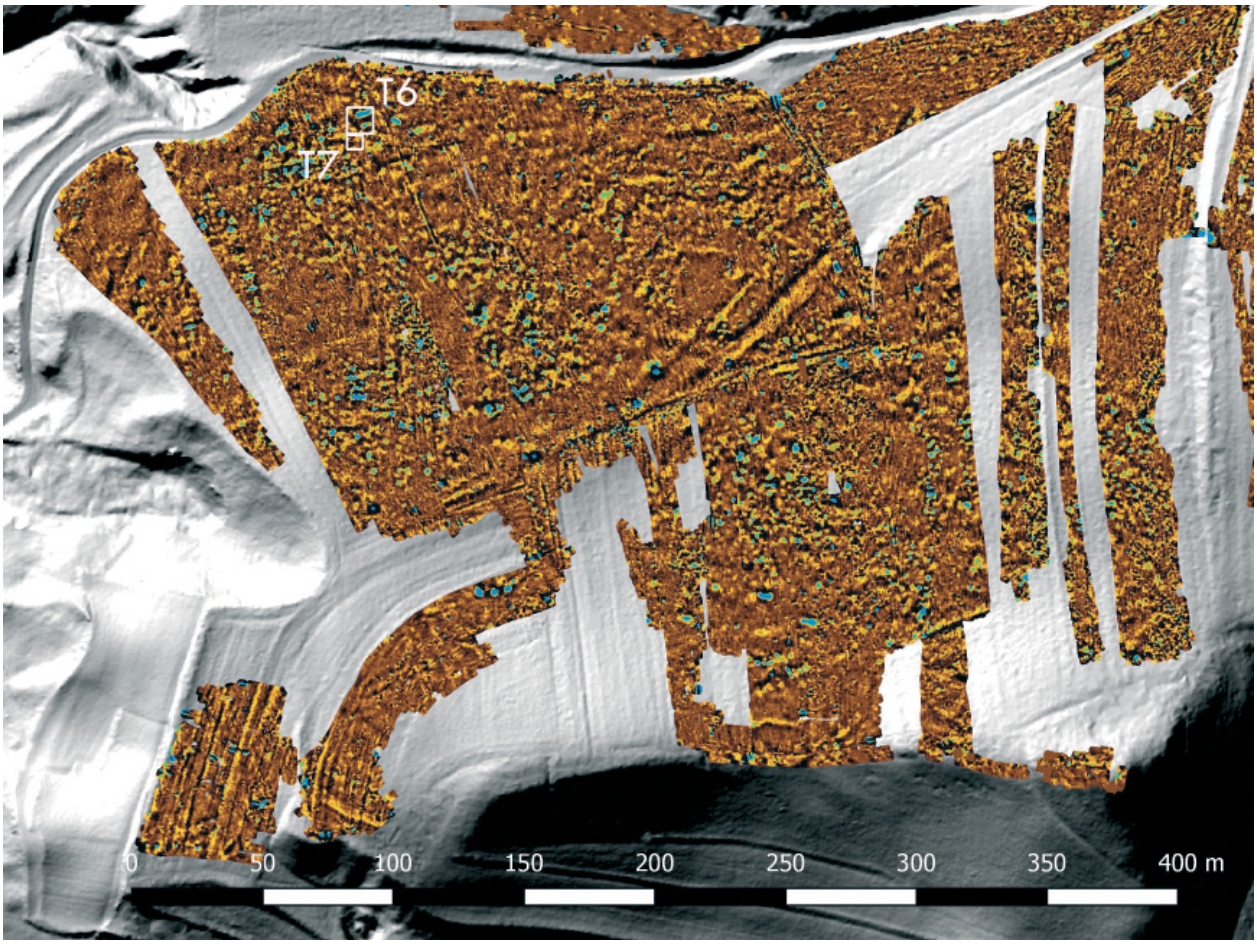

Fig. 13 Magnetogram of Teleac's Lower Settlement (magnetogram by J. Kalmbach, RGK)

tle and daub, but with the difference that some of the latter anomalies are larger than on Jidovar Hill. It is difficult to discern buildings on the magnetogram, but excavations in a 10 × 10-m (T6) and adjacent 6 × 6-m trench (T7) in the north-western part of the Lower Settlement (**Fig. 3**) indicate that some of the larger anomalies with low nT-values between 0 to 2 nT constitute large sunken buildings.[30] Given the large size of the Lower Settlement (its 10 ha constitute almost 60 % of the land suitable for habitation inside the hillfort[31]) coupled with the large amounts of anomalies recorded in the area, it seems clear that the majority of Teleac's population lived there.[32] The geophysics indicate that the settlement structure of the Lower Settlement is much less ordered compared to the Gruşet Plateau and that the structure of buildings and activity areas developed in a more organic fashion (**Fig. 13**). This is perhaps to be expected from a mainly residential area, in particular when other areas in the settlement were set aside for production activities. The large size and gentle terrain of the Lower Settlement also meant that there were no topographical or structural reasons to organise the settlement differently, and from the sprawling nature of habitation it also seems clear that there was little or no socially enforced settlement planning in this part of the hillfort.

The outside borders of the Lower Settlement comprise of the southern ridge and the heavily

[30] The full extent of the two buildings found during excavation in the Lower Settlement continues outside of the trenches. Judging from the magnetogram, the first building has a length of about 9 m and a width of 5 m, whereas the other building has a length of 7 m and a width of 5 m. Both features are only partly excavated, so these assessments may change during upcoming investigations. Both of these features are significantly larger than those of sunken buildings previously found in Teleac (Vasiliev *et al.* 1991, 33-37).

[31] Uhnér *et al.* 2017, 167-168. Although the fortifications in Teleac encompass an area of 30 ha, only about 17.5 ha of the area were well-suited for occupation, for the site has many steep sections.

[32] Uhnér *et al.* 2017, 194.

eroded western side of the hillfort that face the Mureş Valley (**Fig. 2**). Today there are no traces of fortifications in the western part of the site; yet given the large amount of work that was invested in the northern defensive system, it is safe to assume that Teleac's western side also was well-fortified. Although it is impossible to determine with certainty the topographical situation when the hillfort was settled, it is likely that the terrain at the western side rose high and steep above the floodplain below, and that limited built defences would suffice to offer very good protection.

A wooden parapet or low palisade would have been enough to make large sections of the high and steep southern ridge virtually impregnable from enemy attack, but the excavations there have not uncovered any evidence of such a construction.[33] On the other hand, it is notoriously difficult to recognise features in the upper levels in Teleac and the absence of palisade remnants or other signs of manmade fortifications should not be taken as evidence that the southern ridge solely relied on the defensive value of the tall and steep slope. Taken all together, even though the Lower Settlement appears not to have had significant built defences, it was very well protected by the terrain, which not only made assaults at this part of the site difficult, but also made most sections of the southern ridge very hard to attack with projectile weapons.

The north-western part of the settlement

The north-western part of the Teleac hillfort is heavily forested and has therefore not been subject to geomagnetic prospection apart from a small area adjacent to the rampart at the north-western corner of the fortification system (**Fig. 3**). This area has comparatively few anomalies, and – interestingly – there are no indications that the rampart at this part of the settlement was destroyed by fire. There are a few anomalies indicative of fire installations and a couple of large oblong features that might constitute buildings, but the situation is quite different compared to the area by the rampart on the Gruşet Plateau. The excavations in the 1980s and 1970s documented deep cultural layers and pit-buildings close to this area;[34] therefore, it seems safe to assume that that the north-western settlement had an occupation density similar to the Gruşet Plateau.[35] The difference in the magnetogram compared to the Gruşet Plateau and Jidovar Hill may be due to that this part of the settlement was not burned down.

The LiDAR image of Teleac shows that large parts of the slope outside the rampart down to the Mureş Valley are eroded, but it is nonetheless evident that the two outer fortification ditches extend around the fortification system's north-west corner (**Fig. 2**). At least the second ditch was largely redundant from a defensive standpoint because of the steep terrain, but the ditch may have been built to meet two other functions. The first function was that defensive systems should be continuous or link up with natural barriers to avoid flanking manoeuvres by the enemy. The second reason could have been that earth was needed to erect the rampart, similar to the situation on the Gruşet Plateau.

Water supply

It is noteworthy that there are no surface water sources inside the Teleac hillfort; moreover, given that the deep erosion ravines in the lower western part of the site are dry, it would have been impossible to reach the groundwater table through a well in prehistory. It was therefore necessary to bring water into the settlement from nearby water sources. The largest local source was the Mureş River. The LiDAR image of Teleac shows that at one point in time the river meandered close to the hillfort's western side. It is unclear whether this was the river course during the Late Bronze Age, but it is nevertheless clear that the Mureş was a potential source of water. The small valley to the south of the settlement has a creek that runs at a distance of 750 m in a straight line from the gate at Teleac's southern ridge, and about 250 m from the south-western corner of the settlement. The third water source is a small spring in a gully some 250 m north of the gate in the northern fortification system (**Fig. 2**). It is seems unlikely that this spring was large enough to supply the hillfort with sufficient amounts of water, but the population would have had a stable all-season water supply that was fairly easy to bring in to different parts of the settlement if the sources were combined.

[33] Vasiliev *et al.* 1991 Pl. V[1] and V[2].

[34] Vasiliev *et al.* 1991, 36 Fig. 13.

[35] Uhnér *et al.* 2017, 193-194.

A problem of the water sources located outside the settlement was the inherent dangers and difficulties this entailed should a fire occur. Several parts of the settlement appear to have had buildings tightly grouped together, which of course increased the risk that a small fire could develop into a conflagration, if it were not extinguished quickly or prevented from spreading. Another serious problem was if the settlement's defences were attacked with fire. Even if Teleac had water stores earmarked for fighting fires, these would probably be depleted quickly if the attackers made repeated attempts to set the rampart ablaze, and the population would quickly succumb to thirst if the defenders resorted to using drinking water, which would force the hillfort to surrender.

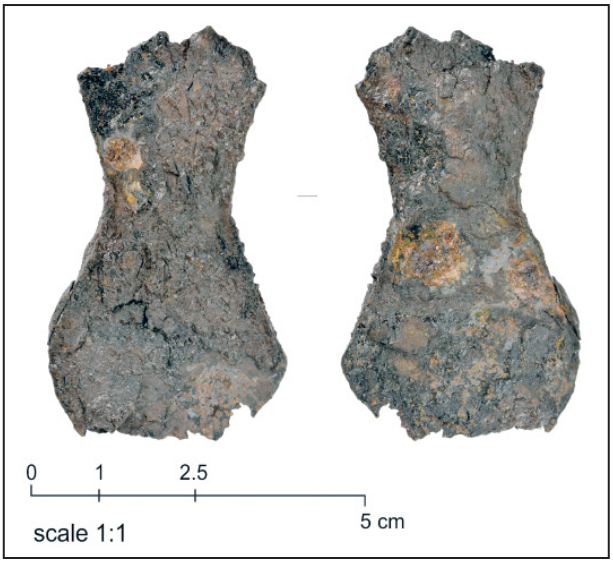

Fig. 14 Iron sword or dagger hilt found at Teleac (photo by C. Suteu)

Warfare and the attack on Teleac

The fact that Teleac had no internal water supply could have been a severe problem in wartime. If the settlement were besieged, it is unlikely that the population could have held out for long. It is however unclear how likely such a scenario is. Hypothetically, the hillfort´s population could bring in extra supplies of water in preparation to defend the site unless a surprise attack was mounted, and this supply could probably suffice for several days if rationed. Given the logistical difficulties in carrying out military operations away from one's own territory – in particular in regard to foodstuffs – it may also have been a problem for attackers to carry out siege operations for prolonged periods.[36] Attackers could of course try to obtain supplies by force from open settlements around Teleac, and perhaps to some extent live off the land, but this would mean dividing the attacking force and thus making siege operations more difficult and rendering the smaller separated forces vulnerable to counterattacks.[37] On the other hand, any forces with adequate military strength and organisation in carrying out an assault on a heavily fortified settlement with a reasonable prospect of success must have been well organised not only militarily but also logistically. And such forces would in all probability have had at least a rudimentary supportive baggage train with wagons and pack animals to help carry supplies as well as plunder if the force managed to capture the settlement. We can of course only speculate on the nature and level of organisation of such military forces; yet even if they were well organised and well supported, it must have been very difficult to keep them in the field in hostile territory for prolonged periods.[38]

Given these problems, it is perhaps not surprising that it appears that Teleac was taken by force as opposed to having been starved into submission as shown by the destruction of the northern rampart and associated finds (**Fig. 14**). That the formidable defences were attacked and breached are good indications of a few factors. It is evident that the attacking forces had significant military strength, and if we accept that the slingshots found by the fortification were used to suppress the defenders, they would also have been well organised and capable of carrying out rudimentary combined arms operations, in which slingshooters supported the troops that tried to breach the defences. Such an attack would also imply that at least the assault component of the attacking force was well-disciplined and willing to carry out dangerous tasks, which is far from the tentative and opportunistic character of warfare sometimes suggested for prehistory.[39]

It must be emphasized that this attack and destruction of the rampart did not result in the end of occupation at Teleac. Namely, two poorly preserved house contexts with accompanying

[36] Keegan 2004, 301-303.
[37] Cf. Uhnér 2010, 286.
[38] Cf. Caesar 1958.
[39] Keegan 2004, 3-12. 114-115; Carman/Carman 2005.

Fig. 15 The salt spring Ocnișoara – Murătură (com. Lopadea Nouă), located in the hills above the Mureș floodplain in a salt-rich area 25 km north-east of Teleac (photo by the authors)

hearths of the Gáva culture were located above the destruction layer by the northern rampart. Unfortunately, the poor state of preservation in the upper layers at Teleac makes it difficult to assess the impact that the attack had upon the rest of the settlement. However, even though the situation along the northern rampart certainly gives the impression that Teleac was violently sacked, there is no evidence of destruction throughout the settlement. The trenches excavated at a distance from the rampart on the Gruşet Plateau and on Jidovar Hill, as well as the trenches in the Lower Settlement have not produced similar evidence of large-scale destruction by fire with valuable household goods left *in situ*.

Mineral resources, location and control

We have previously argued that Teleac was a military stronghold[40] that was supported by and dominated surrounding open settlements.[41] Together they formed a political entity that controlled an area that at least extended for several kilometres along the Mureş Valley. It is likely that the controlled area also included the nearby highland on the Secașelor Plateau to the east of the hillfort and perhaps more importantly parts of the highlands leading into the Apuseni mountains to the west and north-west of Teleac (**Fig. 18**). Teleac's location was not only well suited for defence. The Mureş Valley was undeniably a major trade and transportation route between the eastern and central parts of the Carpathian Basin in prehistory,[42] and Teleac occupied an eminently strategic position on a narrower section of the Valley.

Although we cannot say for sure what was transported and traded along the Mureş Valley, it is clear that Transylvania has an abundance of mineral resources. There are several rich sources of both brine and rock salt in the larger region to the east of Teleac (**Fig. 15**),[43] and the Apuseni Mountains and the Carpathians have several copper deposits, some of which may have been used during the Late Bronze Age.[44] Lead isotope analysis of the Greek Late Helladic silver, including Mycenaean shaft grave silver vessels are consistent with multi-metallic ores from the Apuseni Mountains and from Baia Mare in present-day northern Romania, indicating prehistoric extraction,

40 Keegan 2004, 139-140.
41 Uhnér *et al.* 2017, 195-196.
42 Uhnér 2017, 210-211.
43 Boroffka 2009, 126-129; Harding/Kavruk 2013; Bukowski 2013, 33.
44 Wollmann/Ciugudean 2005; Boroffka 2009, 126-128.

Fig. 16 Remnants of placer gold mining in the Arieș River Valley in the Apuseni Mountains. The mounds on the field around the steel lattice towers are spoil heaps accumulated during gold mining. The heaps have not been dated, but the majority are probably from medieval times (photo by the authors).

although not contemporary with Teleac.[45] The settlement also coincides with the introduction of iron in the eastern Carpathian Basin and Teleac is situated close to several iron sources.[46] The richness of the region around Teleac is underlined by the large number of bronze hoards,[47] including the oversized Late Bronze Age hoards from Aiud, Uioara de Sus and Șpălnaca II to the north of Teleac and Guștерita in the south-east, which together have a combined weight of several tonnes.[48]

Another valuable resource is gold.[49] On the other side of the Mureș Valley, directly opposite from Teleac, is the entrance to the Ampoi Valley, which is one of the better access points to the rich gold deposits around Zlatna, Bucium and Roșia Montană. Furthermore, the riverbeds of the Ampoi and Arieș rivers and their tributaries have gold placer deposits (**Fig. 16**). Due to the state of research it is difficult to determine the significance of these sources for the Late Bronze Age and Early Iron Age. It is however evident that the Apuseni Mountains were an important source of gold during the Early and Middle Bronze Age: namely, the surrounding region has several finds of gold objects that correspond well with the local gold deposits which have a distinctive chemical composition with a very high silver content of c. 26 %.[50] Unfortunately, there are no chemical composition data for gold finds contemporary with the Teleac hillfort. Nonetheless, given that some La Tenè period finds have the same type of gold as the Early and Middle Bronze Age,[51] it seems safe to assume that gold from the Apuseni Mountains was also exploited during the Late Bronze Age and Early Iron Age.

In view of the somewhat scant direct evidence of metal extraction in Transylvania around the beginning of the first millennium BC, it is perhaps not surprising that we have little information on how mining operations were organised and by whom they were carried out. Metal production was an activity that required specialised knowledge and equipment. Mining was also labour intensive. Besides the manpower that was required for the direct extraction and processing of ore, considerable forestry activities were also necessary for pro-

45 Stos-Gale 2014, 198-199 Fig. 18.
46 See Hansen in this volume.
47 Ciugudean *et al.* 2015.
48 Rusu 1981; Hansen/Krause 2017.
49 Ciugudean 2012a.
50 Hartmann 1970, 40; Cristea-Stan/Constantinescu 2016, 37.
51 Hartmann 1970, 40. 47.

Fig. 17 Aerial view of the Teleac hillfort to the North (photo by J. Kalmbach)

viding fuelwood for these activities.[52] But despite this, it appears that fairly large-scale prehistoric mining operations could be carried out without direct involvement of elites in organising and supervising positions.[53] There are few indications of large-scale generation of wealth by communities in the mining districts in Transylvania, which is to be expected when taking the situation in the eastern Alps as a proxy for conditions in Transylvania.[54] Although wealth could theoretically be generated from mining raw materials, surplus extraction associated with raw materials were usually made at bottlenecks in the distribution chain that offered opportunities to certain actors to restrict access or assert a level of control over trade or the distribution of the goods in question.[55]

Settlements, and in particular fortified settlements of stronghold character, located at strategic points for communication, can constitute such bottlenecks, for they provide opportunities to control transportation and trade. The fact that a settlement is located on such a strategic position does not of course necessarily mean that it asserted control over transportation and trade, but there are a few aspects that are strong indications that this indeed was the situation in Teleac. The first aspect is that the hillfort occupies a prominent position that is visible from afar in the Mureş Valley (**Fig. 17**). Such conspicuous locations of fortified settlements were strong symbolic expressions of ownership and assertion of control over a territory and its resources,[56] and a readiness of the population to use military force to defend and enforce their interests, if they were challenged by other parties. The lasting occupation of Teleac, coupled with contemporary long-term surrounding open settlements, makes evident a close association between the population and the region, which would have established strong aspects of ownership over arable lands and fields for grazing. Much of this derived from everyday labour investments and entanglement of people in the local environment. For instance, by tilling and using the land, but also through military capacity as expressed by the strong defences in Teleac, ownership in societies without institutionalised legal systems also rested upon the ability

[52] Placer mining for gold is however an activity that can be carried out by small workforces without much supportive infrastructure. That said, placer mining operations can be considerable undertakings and involve large workforces.

[53] Uhnér 2010, 134.

[54] Cf. Shennan 1995, 360; 1999; Uhnér 2010, 151-153.

[55] Cf. Earle *et al.* 2015.

[56] Earle 2017, 9.

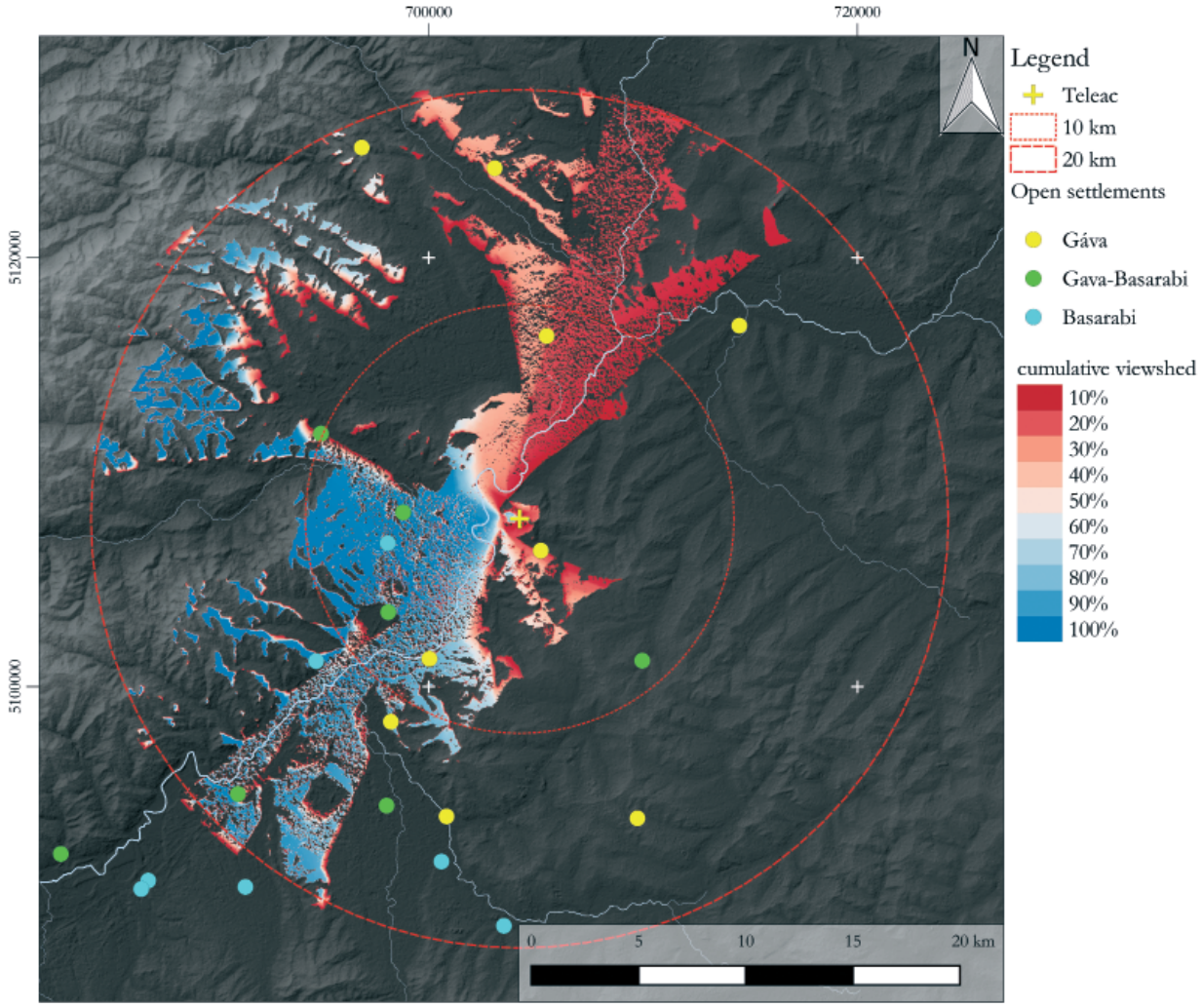

Fig. 18 Cumulative 20-km radius viewshed analysis centred on the Teleac hillfort, mapped with surrounding open settlements (image by the authors)

to defend and capture valuable objects and means, in this case the hillfort could also have been used to access and assert a level of control over nearby routes for transportation and trade. This should not be understood as total control actively backed by military force on all transportation and trade that passed through Teleac's surroundings – and it certainly did not mean that actors in Teleac could extract excessive tributes from this trade. Most trade would soon follow routes around the hillfort's territory if the latter strategy were enforced,[57] and Teleac would as a result be isolated and forgo an important economic asset.

The control that Teleac exercised likely concerned two interrelated parts. The first involved the relationship between the hillfort and the population that lived in nearby open settlements. By virtue of Teleac's large population and strong fortification system, it seems evident that the hillfort had a significant local advantage in terms of military and economic strength, which could be leveraged into establishing and maintaining Teleac as a political centre. The second aspect concerned the movement of people and goods from farther afield through the immediate region. A cumulative viewshed analysis shows that Teleac occupied a location that offered a commanding view of large swaths of land (**Fig. 18**).[58] The most visible area is to the west and south-west of the hillfort,

[57] Uhnér 2010, 284.

[58] The viewshed is based on 382 observation points covering all significant areas inside the hillfort. The advantage of a cumulative viewshed is that the method explores the whole potential of what is visible from Teleac, but it is important to emphasise that the red coloured areas in the viewshed to the north of Teleac should not be understood as being poorly visible. They are instead well visible but only from the upper northern part of the hillfort.

Total area in a 10 km radius	Total visible area in a 10 km radius	Total area in a 20 km radius	Total visible area in a 20 km radius
31383 ha	10898 ha	125534 ha	23460 ha

Table 1 Visible areas from the Teleac hillfort in 10- and 20-km radii

including large parts of the Mureş Valley and the lower section of the Ampoi Valley leading into the Apuseni Mountains to the west. At this point it is unclear what type of vegetation the Mureş Valley had in the Late Bronze Age and Early Iron Age.[59] Given that the river terraces in the valley were rather densely settled by agricultural communities and had been settled for a long time, it is likely that large parts were deforested. But since the narrowest section of the valley as seen from Teleac was 7 km wide, it would still have been difficult to see small groups of people moving through the landscape, and it would have been difficult to intercept fast moving groups on the other side of the valley, even if they were observed from Teleac. That said, since it seems clear that nearby open settlements belonged to the same political entity as Teleac, it was not necessary to centre every aspect of land control to the hillfort, and it would have been almost impossible for large parties to move through the region without being noticed.

That nearby open settlements and traffic through the Mureş and Ampoi valleys could be monitored from Teleac was of course significant, but perhaps more important was that the hillfort's presence loomed large in view. The strength of the hillfort was always present for the population in the open settlements. This could instill a positive sense of security against threats from the outside, but it was also evident where military power was concentrated and that this power could be used to keep the region's population in line if necessary. A similar argument can be made for long-distance transportation and trade. The prime reason behind the size and local importance of Teleac was the settlement's strategic location for control and participation in these activities, which gave Teleac's population an incentive to protect and support most if not all people involved, even if they came from and were headed towards other regions. Routes near Teleac were probably safe from foreign raiding, but traders probably had to collaborate with local economic interests, and perhaps pay for the privilege to pass through the territory (again with the caveat that it would have been counterproductive to demand exorbitant rates). The evident strength of the hillfort would have been an important tool to passively enforce such strategies as travelling parties would not risk stepping out of line.

Concluding discussion

Teleac was located at a geographical bottleneck for interregional transportation and trade between communities on the Transylvanian Plateau in the East and the central parts of the Carpathian Basin in the West, and the hillfort and nearby open settlements controlled the entrance to the much smaller, but on a local and regional level important Ampoi Valley. The hillfort was also positioned directly on a crossroad, which was probably only of local importance, between the Mureş Valley and a small valley that follows a creek up towards the Secaşelor highlands in the East. Teleac was thus located in a strategic position both regionally and locally, which is also evident on a cost-surface analysis that shows that a large number of open settlements were located in less than 8-hours travel distance by foot from Teleac **(Fig. 19)**. The strategic location explains in part both the large population and the apparent prosperity of Teleac, as well as why the settlement was heavily fortified. Once Teleac was fortified with a substantial population,[60] it had several important advantages in relation to surrounding open settlements, which would have established Teleac as a political centre, even if this perhaps was not the intention when the settlement was established.

The attack and destruction of the northern rampart at Teleac are strong indications that 10th-century military forces in south-eastern Transylvania could have been both large and well organised. The force that attacked Teleac had significant offensive abilities and the capacity to breach substantial de-

[59] Feurdean/Tanţău 2017.

[60] Uhnér *et al.* 2017, 192-195.

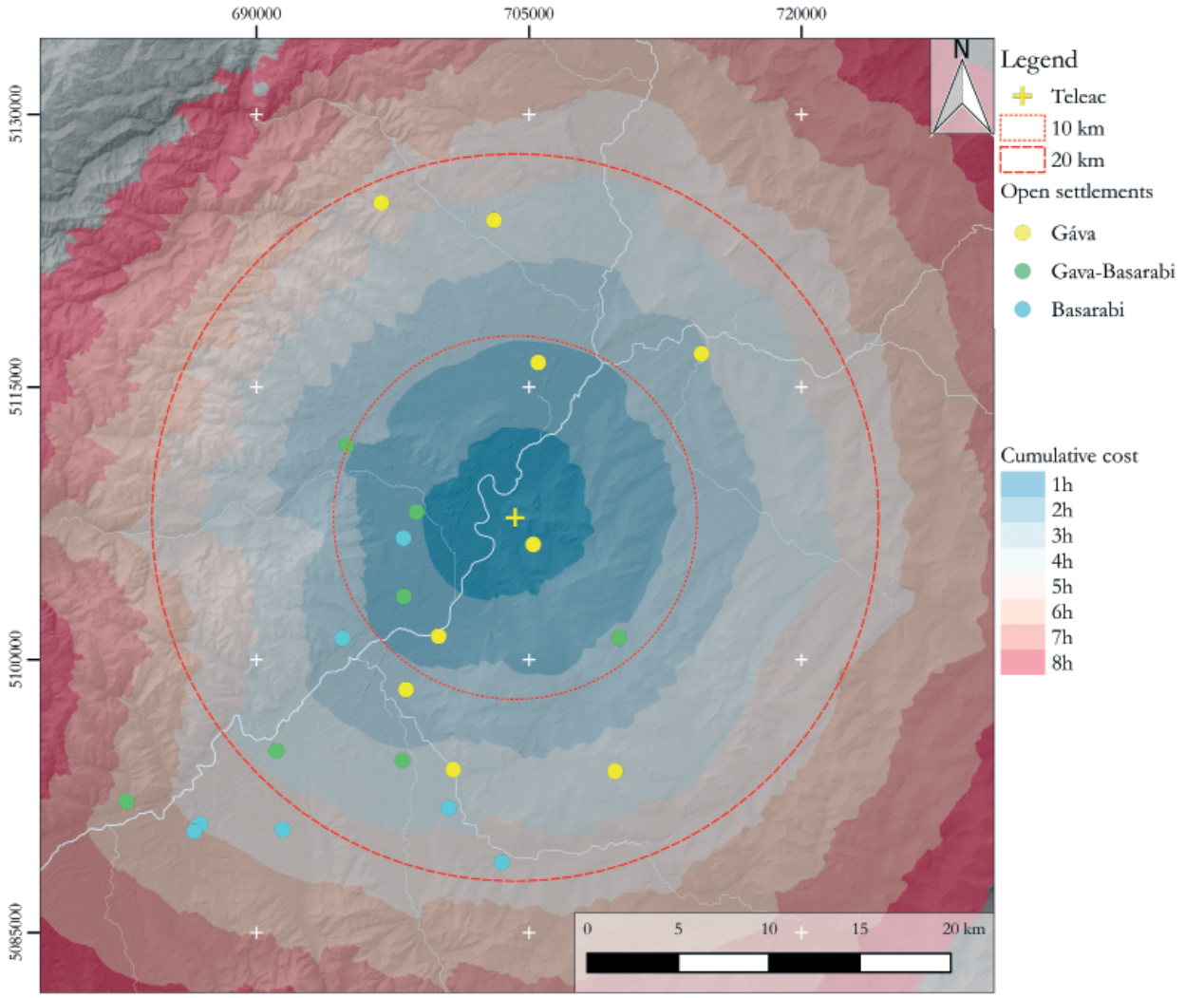

Fig. 19 Cost-surface analysis centred on the Teleac hillfort (image by the authors)

fensive systems. They could also carry out operations in enemy territory, possibly far from their home territory, which suggests that they had a good logistical support system. This implies that the level of military threat was serious, making it rational to invest in large and costly fortification systems in order to deter attackers.

Because Teleac was an economic and political centre, as well as an important hub for transportation and trade, there were several potential threats to the settlement. Apart from raiding with the straightforward goal of seizing valuable goods, there was also an incentive for people with power ambitions to subjugate the hillfort, either with the objective to take over existing power relations in the immediate region or to establish a new order of things. It is of course impossible to determine with certainty the reasons behind the attack on Teleac, but the overall situation found inside the hillfort provides some clues (**Fig. 20**). The most important aspect is that there are no indications that the rampart was re-built after the attack. It is theoretically possible that traces of a simple palisade along the rampart's edge have been destroyed since then by erosion. A low palisade or wooden parapet would have had real defensive value, as the lower part of the rampart remained largely intact along with the outer defensive ditches. What speaks against this is the position of one of the buildings that was built after the destruction event: namely, it was located so close to the hypothetical position of a palisade that it would have been impossible to man the defences. Although the earlier building that was destroyed under the attack of Teleac also was built directly adjacent to the rampart's inner side, it was located about four meters away from the face of the rampart, which left the defenders with a wide enough platform to stand upon. This would have been impossible with the location of the later building. Given this situation, it is unlikely that the defensive system was rebuilt after the attack.

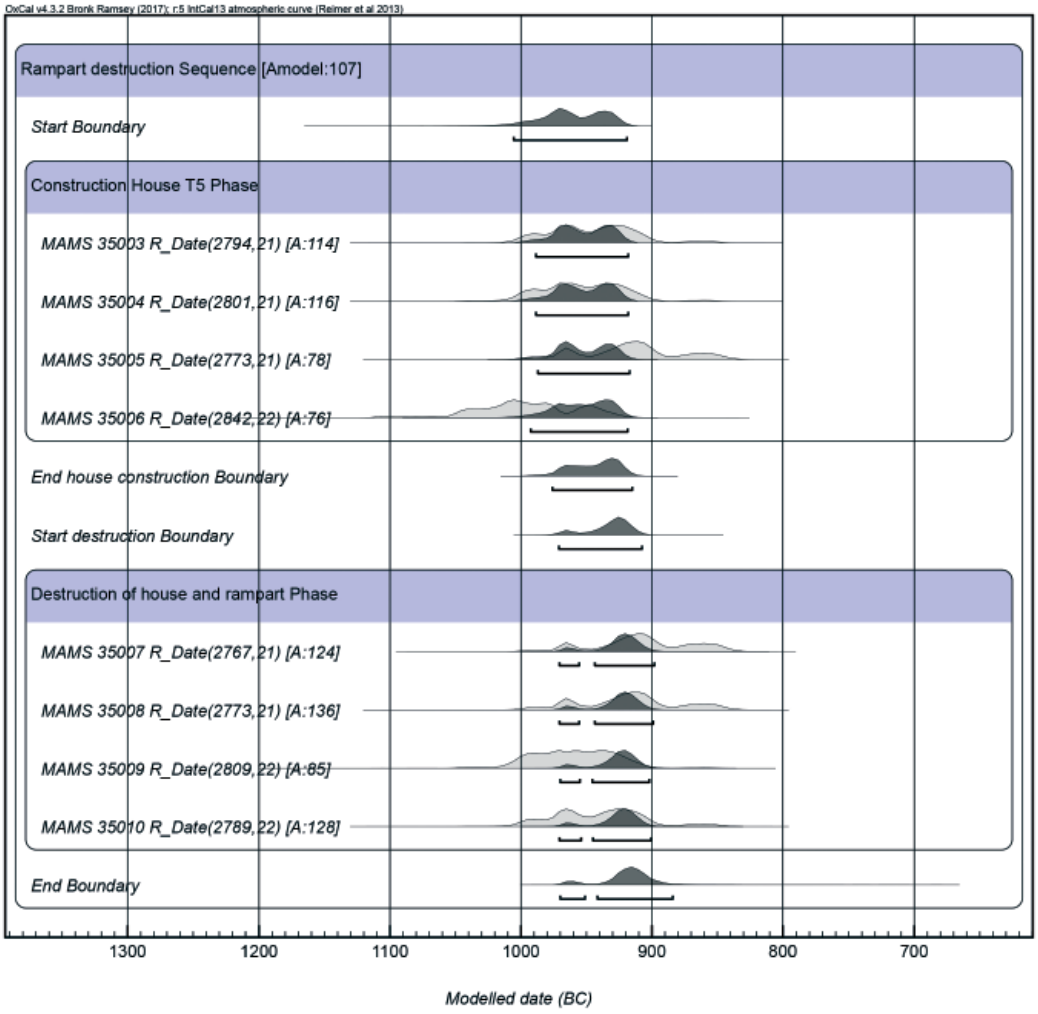

Fig. 20 Probability distributions of dates relating to the construction of the 9 × 6-m building by the northern rampart, and the destruction of the northern fortification system (graphic by the authors)

The fact that the fortifications were destroyed and not rebuilt makes it implausible that the attack was mounted by a rival faction in order to take advantage of the hillfort's strategic position and to impose a level of control over transportation and trade along the Mureş Valley using the strategies outlined above. It is of course possible that the attack was carried out just with the intention to plunder, but if that were the case it is peculiar that the defensive system was not rebuilt by the remaining population, since the threat of enemy attacks clearly existed. A possible explanation is that the settlement fell under the political and military domination of the entity that carried out the attack, and that it was in the entity's interest to hinder the resurgence of Teleac as a political centre. Even though occupation continued, it is unlikely that the settlement maintained its position after the destruction of the northern fortification system.

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