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## **THE GEOMORPHOLOGICAL MATRIX AS A STARTING POINT FOR DETERMINING THE POSITION OF AVAR-TIME SETTLEMENTS IN PANNONIA: THE EXAMPLE OF THE BAČKA REGION**

Archaeology has at its disposal a very rich fund of over 60,000 studied graves from the times of the Avar domination (Daim 2003, 463). The total number of known settlements is unequally and disproportionately smaller than the number of known cemeteries, though it increased in recent years. This article offers a methodological model for the identification of sites used for settling in Pannonia at that time. The territorial framework of this work encompasses the larger Serbian part of the Bačka region (i.e. the western part of the present-day Serbian province of Vojvodina; Southern Pannonia), but the model of comparing geomorphological matrix and archaeological evidence is, in my opinion, applicable to Pannonia in general<sup>1</sup>.

The characterization of settlement structures by using geological and geomorphological data is a well-known method which belongs to the traditional settlement archaeology and is mentioned for example by H. Jankuhn (1977, 41-52) under the label »relief« among the environmental settlement conditions (ibid. 52-63 for climate, soil and water supply). The aspects of geomorphology, climate and soil can even be found in the early work of H. Stoll (1933, 9-14) and then played an important role in the development of site-catchment-analyses in the 1960s and 1970s (e.g. Vita-Finzi / Higgs 1970, 16-32). Within following studies, no special emphasis was placed on geomorphological features, but they were of course still taken into consideration (e.g. Schmotz 1989, 20-24 fig. 2; 56-58; Schier 1990, 29-31. 120-129). The latest environmental studies were undertaken in Hungary, north of the Serbian Bačka region (Gál et al. 2005). A recently published overview concerning Avar settlements did not emphasize geographical conditions (Kory 2002) – unlike another article focusing precisely on Bačka (Takács 2000a). It is particularly interesting to apply the presented method to the Bačka region, because a preference of an Avar settlement seems to be to lie on the borders of geomorphological units. Taking into account the diversity of aspects which influenced the construction of an Avar settlement, the geomorphological feature is only one aspect – but seemingly a crucial one. Other sources for the reconstruction of the environment of the Early Middle Ages (like palaeobotanical studies etc.) are not available for this region.

It needs to be stressed that I adopted the dating of Avar cemeteries and finds from literature. I did not venture a more precise dating based on reference works – such work could only be the subject of a separate exhaustive paper, apart from the fact that it is not of importance for a methodological presentation like it is given here.

For some sites mentioned, the authors opted for a rather daring ethnic attribution. This is not to be discussed here, being of no relevance for the settlement positioning matrix.

### **AN INTRODUCTION TO THE LANDSCAPE OF VOJVODINA**

The existing geomorphology of the wider territory of Southern Pannonia is the result of processes, from the remote geological past as well as current ones (Vujević 1939, 3). The fact that the Pannonian Basin is sinking

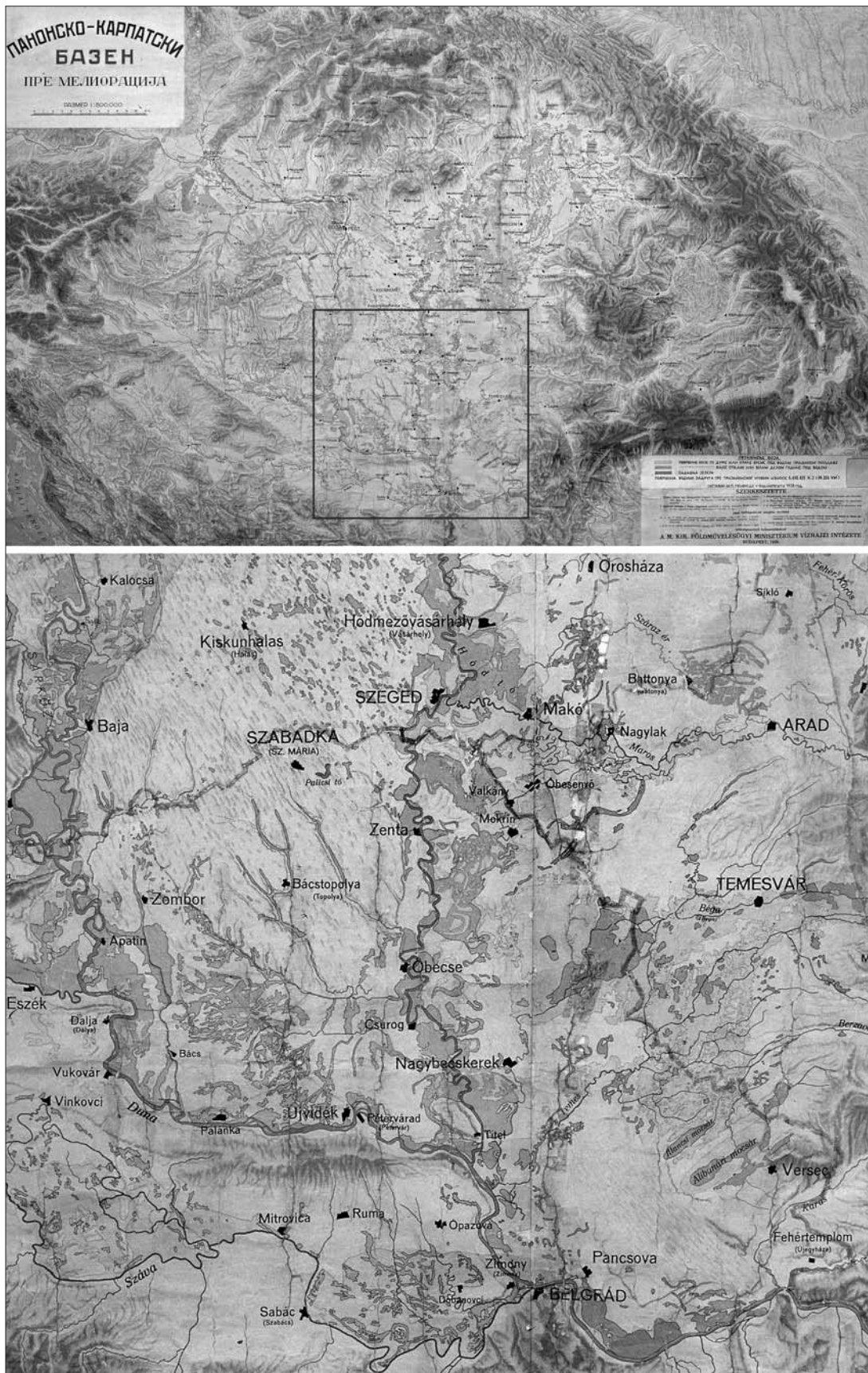


Fig. 1 Map of the Pannonian basin before the hydro-regulatory works. – (After Kir 1938).

leads to regular river floodings – in spite of massive regulation works undertaken in modern times. The biggest rivers are the Danube, the Sava and the Tisza, typical flatland rivers that have been strongly influencing the morphology of the Vojvodina terrain. Despite the existence of big river systems, Vojvodina is not rich in running waters. The nature of the soil does not allow a denser river network. The riverbeds of the big rivers run deep, but not the beds of the smaller ones, and thus there are floods, riverbed displacements and natural formations of oxbows/backwaters and abandoned minor meanders. This is to be seen in a section of a map showing the Pannonian Basin before hydro-regulatory works have been carried out (fig. 1).

The Danube and its tributaries as well as the Tisza influence each other. In summer, the rivers flood due to rains, in winter also because of parts of floating ice sticking together. Flooding of the Tisza forms natural embankments which disturb an easy retreat of the waters. Collateral erosion of soft soil corrects the riverbeds – this is how many backwaters are generated and flood areas are widened. The water in stagnant tributaries (swamps and marshes) is mostly fresh because it gets renewed, sometimes also by subterranean water. In the middle of the 19<sup>th</sup> century, water covered 63,600 ha of the surface of Vojvodina (Vujević 1939, 20-26).

A further prominent geographical feature of Vojvodina are the numerous *puszta*, *pustare* (Pannonian steppes) which characterize the climate with substantial annual temperature fluctuations. *Pustare* are great expanses of grass, their vegetation originating in the Russian and Central Asian steppes (ibid. 8f.). The climate of Vojvodina belongs to the moderate-continental climate zone and consists of warm summers, cold winters, and a regular spread of precipitation all the year round. Nowadays, the average annual temperature is 11°C (Koščal / Menković 2005, 6f.). There is an annually rainfall of 550-740 mm. In the warmer months, storms are frequent. Looking at the wind rose, northerlies are the most current winds. On the average, wind force is not too strong, of some 2-3 m/s. Exceptionally though, very strong south-easterly winds can blow over both Banat and Bačka, with 40 km/h and up to 95 km/h sometimes (Vujević 1939, 16-20).

## THE AVAR SETTLEMENT

By the time of their arrival in Vojvodina, the Avars did neither encounter a mild or favourable climate, nor did they, looking particularly at Bačka, come across a developed agriculture – the area suitable for agricultural activities was considerably smaller than today. They arrived in a sparsely populated area<sup>2</sup> which offered them two major advantages. On one hand, the territory of Southern Pannonia resembled their native Asian steppes, on the other hand, it was located in the immediate vicinity of the Byzantine Empire – in the case of Srem of a Byzantine province even, at least nominally. It is not difficult to assume that the Avars enjoyed life under conditions they were already used to, and in a place which promised successful plunderings of the territories of the Empire and victorious raids against their rivals. F. Daim states that, apart from the great expanses of land, Pannonia offered the Avars some infrastructure as well – the network of Roman roads, in a bad condition, but still usable –, and also some arable land cultivated by the local population (Daim 2003, 469).

## THE BAČKA REGION

Bačka is a part of Vojvodina, framed by the Danube in the south and west and by the Tisza in the east, its northernmost part belonging to present-day Hungary. The Serbian part of Bačka ranges over 8,913 km<sup>2</sup>.



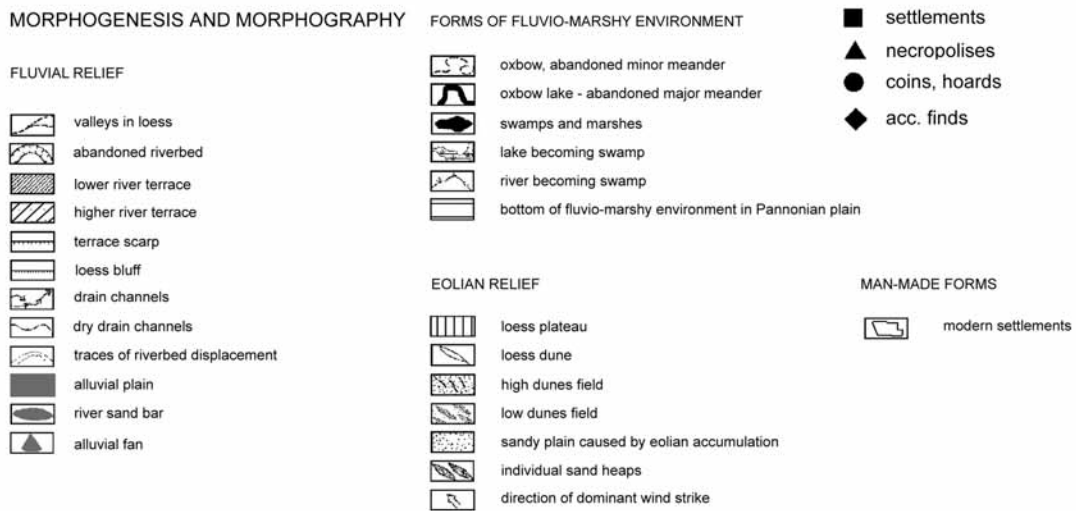
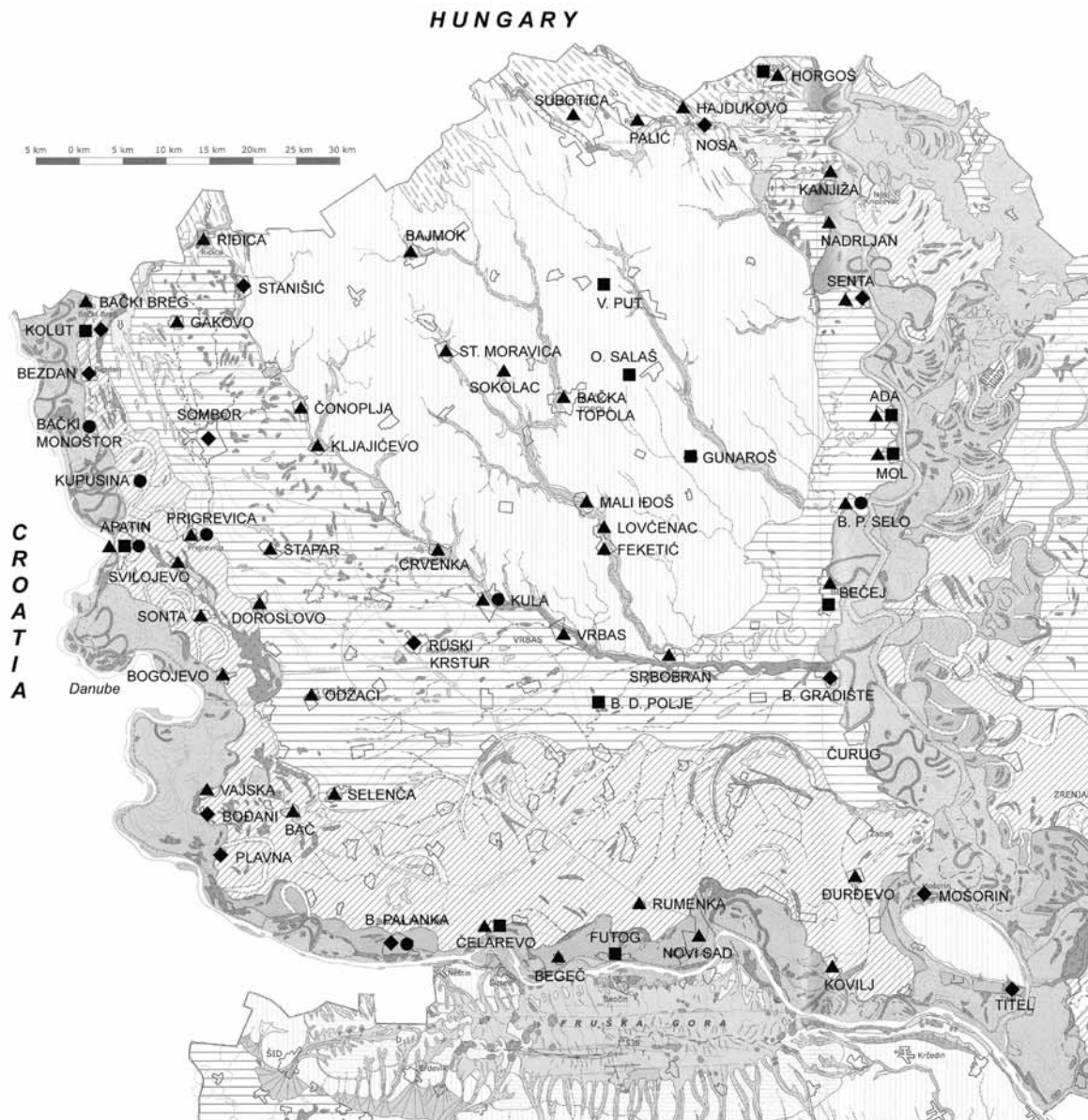


Fig. 2 Geomorphological map of the Bačka region (after Geomorphological Map 2005) with mapping of all sites of the Avar period.

The average altitude is 80-90m, except for the northern part towards the Subotica-Horgoš (Szabadka-Horgos) sands<sup>3</sup> where the altitude is over 100m.

There are no major rivers in Bačka, but the smaller ones are difficult enough to control. Besides some drain channels in the flood areas, three small rivers have their sources in the vicinity of Subotica. Next to the rivers Kiriš and Krivaja, the Čik flows into the Tisza near Bačko Petrovo Selo (Pétteréve; Vujević 1939, 20-26). Of considerable archaeological importance are the banks of the lakes around Subotica/Palić, Kelebija and Ludoš lake – which represent the edges of former marshlands (Ric 1998, 34).

In respect of the flood areas, one key phenomenon of the geography of Vojvodina deserves special attention. In the times before the melioration works began, the population of every period respected certain norms concerning buildings and the design of their settlements, namely the geomorphological features of the ground. A well-chosen location for a settlement often decided over its fate (Ćurčić / Đuričić 1994)<sup>4</sup>. Even today most of the settlements are built in this way, although the melioration works enable a construction in formerly unsuitable places.

As stated above, the borders of different geomorphological units were usually used for settling. On the territory of present-day Vojvodina there are 261 such »borderline« settlements, i.e. 57.1% of all recent settlements. It is worth mentioning that some of the geomorphological units are too big to be left unsettled: in such cases favorable micro-relief circumstances would determine further settling. Bačka is the only part of Vojvodina today where less than half of the total number of settlements fall in this border category (67, i.e. 40.9%). They are situated on seven different geomorphological borders (ibid. 147-149). Below, the available archaeological evidence from Bačka will be studied, following the principle of geomorphological positioning (fig. 2).

### **The northern part of Bačka**

Ridica (Regőce) is located in Northwest Bačka, at the spot where three geomorphological units – the alluvial plain, the bottom of the fluvio-marshy environment of the Pannonian Basin, and the low dunes field – meet. Ridica is also situated along the course of the small river Plazović (Ćurčić / Đuričić 1994, 150f.). From Ridica an accidentally discovered Early Avar grave is available (Dimitrijević et al. 1962, 55). It should be mentioned that alluvial plains represent the lowest zones of the Pannonian plain. Along the courses of the three major rivers, they are 5-15km wide. They are made up of sandy and mud-sand sediments. The bottom of the fluvio-marshy environment of the Pannonian Basin covers the wider area of Vojvodina with altitudes of 80-90m. Low as well as high sand dunes and individual sand heaps are the result of wind activity; in the same way loess was piled (Koščal / Menković 2005, 13f. 22. 26).

Kelebija, Subotica and Palić (Palics) are located on the seam of the low dunes field and the loess plateau. Also situated on the border of the sands and the loess plateau are Šupljak (Suplyák) and Bački Vinogradi. The contact of these geomorphological units is highly gradual. The settlements mostly rest on the sands where soil depressions turned into lakes or marshes and were formerly used for water supply. There are no particularly noticeable geomorphological determinants for their topographic positioning. This also applies for Hajdukovo, resting on the low dunes field (Ćurčić / Đuričić 1994, 150. 159). Nosa is located in a reconstructed valley on aeolian sands, near lake Ludoš.

On the Kelebija-Subotica stretch, one Avar burial has been recorded (Ric 1997, 205)<sup>5</sup>. In Subotica, there was a nowadays destroyed necropolis at the Bivša Ciglana Mačković site. Only the inventory of one grave is preserved, dating from the Early Avar period (Dimitrijević et al. 1962, 61f.). Also from Subotica are the remains of the Avar necropolis from the Zemlja Birčić i Mesaroš site, and the finds most probably repre-

senting Avar cemeteries (sites of Sand, Kuća Berenji J., Šupljak/Zemlja Šarčević; Ric 1979, 38). From the last mentioned Palić site, a grave of a man is existent (id. 1997, 205)<sup>6</sup>.

Horgoš is situated on the border of the sandy plain caused by aeolian accumulation and the bottom of the fluvio-marshy environment of the Pannonian Basin; it strongly inclines towards the alluvial plain of the Tisza river. In Horgoš, at the Budžak site, a totality of 80 Late Avar graves has been studied (id. 2003, 328-336). At the same place, at the Erdegljuk site, six Avar graves have been excavated (id. 1979, 32). Near Horgoš, at the Stub 76 site, a settlement dated to the 5<sup>th</sup>-6<sup>th</sup>/7<sup>th</sup>-8<sup>th</sup> centuries was recorded (Trifunović 2007)<sup>7</sup>. A horseman's grave was accidentally found in Hajdukovo (Mrkobrad 1980, 93 no. 618), and from Nosa came a well-known »disentangling hook« also found by chance (Sekereš 1957).

### **The North Bačka loess (Telečka) plateau**

South of the sites just mentioned stretches the North Bačka loess plateau, bordered in the East and West on the zone of the bottom of the fluvio-marshy environment of the Pannonian Basin. This loess plateau is the largest one in Vojvodina. It covers about 2,800 km<sup>2</sup>. Except on its northern side, it is bordered by loess bluffs which are 10-20 m high (Koščal / Menković 2005, 21). The rivulets Krivaja and Čik, right tributaries of the Tisza, divide the North Bačka plateau into three parts. Even today there are not many settlements on this loess plateau, and the discovered archaeological sites mostly coincide with modern settlements.

Along the ramified course of the Krivaja, there are eight Avar-time sites. In Bajmok, one grave was recorded at the Kalvarija site; it is possible that the site represents a necropolis (Ric 1979, 29). From the Stara Moravica (Ómoravica) cemetery, a total of 204 graves was found, spanning from the 7<sup>th</sup> to the end of the 8<sup>th</sup>/beginning of the 9<sup>th</sup> centuries (id. 1987, 148). L. Sekereš (1958, 133f.) published some interesting Late Avar finds from Sokolac (Szokolac) and noted that they were found on a hill, the lay of the land indicating a cemetery. In Bačka Topola (Topolya), at the Bankert-Klanica site, a cemetery of over 180 Avar-time graves, along with ca. 40 Sarmatian ones, was excavated (Mrkobrad 1980, 89 no. 581)<sup>8</sup>.

In Mali Idoš (Kishegyes), at the Kulski Put site, 115 graves were discovered, more than 30 of them being Sarmatian. The others can be linked with the Avars. Also in Mali Idoš, a cemetery of more than 20 graves was studied at the Kalvarija-Opštinska Ciglana site, containing mostly material from the latest period (Dimitrijević et al. 1962, 44-48). Other remnants of an Avar cemetery of Mali Idoš were recorded at Željeznička Stanica (Ric 1979, 33).

Originating from Lovćenac are the finds from the grave of a horseman from the Sekić (Szekics) site. The grave was dated by a *solidus* of the Emperors Heraclius and Heraclius Constantinus, minted between 616 and 625 (Vinski 1958, 13 Tab. VII/25; Garam 1992, 156. 171; Somogyi 1997, 62). Two(?) Early Avar horsemen's graves have been found at the Feketić (Bácsfeketehegy) Ciglana site. At the same site, several finds linked with the Late Avar period were recorded (Dimitrijević et al. 1962, 40f.). At the Feketić-Bolmanska Ulica site, around 10 Late Avar graves were excavated (Ric 1997, 205).

In northeastern Bačka (as recorded in the literature), a dense network of settlements was formed by new nomadic groups arriving from the East. It lasted until the first decades of the 9<sup>th</sup> century when the so-called Second Khaganate definitely fell. This group of sites consists of Stara Moravica/Rekreacioni Centar Kopalo, Bački Sokolac/Moravički Put, Horgoš/Budžak, and Feketić/Bolmanska Ulica (id. 1998, 34).

On the very border with the bottom of the fluvio-marshy environment of the Pannonian Basin, there is Srbobran (Szenttamás). In Srbobran, at the Ciglana Budućnost site, several graves were recorded, but most of them are destroyed. In one grave, a glass *rhyton* was discovered; another horseman's grave is from the time of the Late Avar domination (Hađmaš 1957, 236-238; Dimitrijević 1975, 84; Mrkobrad 1980, 93 no. 607).



During rescue excavations in 1991 due to the building of the E-75 motorway, two Early Mediaeval settlements were discovered on the North Bačka loess plateau, between the rivulets of Krivaja and Čik. The settlement near Ozarik Salaš consists of two recorded habitations. The cultural layer is poor and damaged by farming; though a number of Sarmatian fragments of earthenware is of note, indicating the existence of a Sarmatian settlement nearby. The Veliki Put site represents the southern periphery of the settlement. It consists of eight objects, semi-dugouts and dugouts. Referring to the pottery finds, D. Andelić ascribes both settlements to the Slavs. The Ozarik Salaš settlement is dated to the 8<sup>th</sup>/beginning of the 9<sup>th</sup> century, and Veliki Put to the 9<sup>th</sup> century (Andelić 1994, 115-128). These two sites represent rare finds from Bačka; their positioning cannot be explained by clear geomorphological conditions, although the Veliki Put settlement inclines towards the course of the river Čik.

It is symptomatic, however, that the valley of the Čik in the North Bačka loess plateau remained practically uninhabited during Avar domination – given the absence of archaeological evidence. This does not correspond with the general remark that »most (Avar) settlements are located on loess plateaus, right on watercourse or close to it« (Kory 2002, 608). In this valley there are much fewer modern settlements, as well as in the valley of the Krivaja, west on the same loess plateau.

On the other hand, there is a settlement from the P. D. Pobeda site, north of the village of Gunaroš. It is located on the right hand side of the Čik, along its upper course, on its rather high bank, about 500m long with an altitude difference of 10m. Sarmatian, Early Mediaeval and Mediaeval settlement traces were recorded<sup>9</sup>. On the basis of hand-formed pottery fragments, D. Andelić dates one Early Mediaeval settlement – a dugout with an oven in the southern corner and a trench – to the 5<sup>th</sup> and the first half of the 6<sup>th</sup> century and attributes it to the Slavs (Andelić 2003, 369f.).

It is only logical to find the settlements of the North Bačka loess plateau, an area where water supply was a serious problem, initially built in the principal and side valleys of the Krivaja and even the Čik. Accordingly, M. Takács states that Telečka (the North Bačka loess plateau) was a densely settled area in the Middle and Late Avar periods – thanks to its waterways (Takács 2000a, 462f.).

### **The borders of the North Bačka loess plateau**

On the seam of the southwestern border of the North Bačka loess plateau and the bottom of the fluvio-marshy environment of the Pannonian Basin, northwest of Srbobran, there are also traces from the times of Avar domination. Although the positioning on the border is a more prominent feature, Srbobran, Vrbas (Verbász; **fig. 3**), Kula, Crvenka (Cservenka) and Sivac are situated along the Crna Bara valley (Ćurčić / Đuričić 1994, 161).

In Vrbas, at the Polet site, a big necropolis was excavated, dated to the second part of the 7<sup>th</sup>/8<sup>th</sup> century. A total number of 160 graves was found (Nagy 1971). An Early Avar female burial was found at the Ciglana Telečka site in Kula (Dimitrijević et al. 1962, 44). From Kula also comes an accidental find of a *solidus* of the Emperor Phocas (Somogyi 1997, 58f.). An inventory from several graves is known from Crvenka, but there are no further details (Mrkobrad 1980, 107 no. 710).

In Kljajićevo (Kerény) two Avar graves were found (ibid. 107 no. 713). A rough dating of the necropolis at the Ciglana site in Čonoplja (Csonoplya) – consisting of ca. 20 studied graves – would place it in the second half of the 7<sup>th</sup>/8<sup>th</sup> century. It was excavated in the 1960s, but published only recently (ibid. 92 no. 603; Radojević 2003). From an unknown site in Stanišić comes a golden earring pendant, again with no further details (Mrkobrad 1980, 95 no. 634).

On the eastern border of the North Bačka loess plateau and the bottom of the fluvio-marshy environment of the Pannonian Basin, there are virtually no settlements, even today – only four exist. Therefore there are



**Fig. 3** Aerial photograph of the vicinity of Vrbas. – (Photograph N. Stanojev).

no recorded Avar-time sites. This seems to correspond to the situation commented on for the eastern part of the loess plateau. The reason for this difference in density of settlements along the eastern part of the seam is probably of a geomorphological nature. All settlements are located in places where the contact of the geomorphological units is manifested through high ridges or loess bluffs. East of Srbobran, 50 km wide and running up to the next village of Gornji Breg, stretches a pre-loess fossil flood plain. The border between the geomorphological units here is shaped as a large interim zone with no obvious natural variations which usually determine the settling along the borders of units Ćurčić / Đuričić 1994, 151).

### **The fluvio-marshy zone**

The zone of the bottom of the fluvio-marshy environment of the Pannonian Basin expands to the West, South and East of the North Bačka loess plateau, representing a geomorphological unit of considerable size. Nevertheless, leaving its northern edge aside, it is not densely settled. We will propose reasons for geomorphological sustainability of locations where – within the zone – traces of interest were found.

Looking from northwest to the southeast, Gakovo (Gádor), Sombor (Zombor) and Stapar (Ósztapár) are close to present-day marshes and individual sand heaps. Gakovo and Sombor are located at drain channels as well. Drain channels are weak, mostly meandering river courses that result from the draining of marshes and swamps. Before the melioration works, the drain channels were filled with water (Koščál / Menković 2005, 16).

Near Gakovo, three graves were found (Mrkobrad 1980, 95 no. 633)<sup>10</sup>. Individual finds come from the site of Ciglana Kukula in Sombor. They are mostly dated to the Early Avar period, although older material is also present – probably in Germanic use (Dimitrijević et al. 1962, 58f.). From Stapar, finds of weapons and equestrian equipment, probably from a destroyed Early Avar grave (Radojević 1990, 131f.), and an accidental find of a gold coin of the Emperor Constantinus IV (668-685) exist (Somogyi 1997, 78).

Odžaci (Hódság) is another place where we could not identify geomorphological positioning conditions. Settling was confirmed, though, by the cemeteries at sites Odžaci IV, Odžaci V and Kartonaža. At Odžaci IV, about 20 graves were recorded, some of them damaged. It is not entirely studied; archaeological material from the 7<sup>th</sup> and 8<sup>th</sup> centuries was recorded. Odžaci V is only 2.5 km away from Odžaci IV. 15 graves were excavated, the material corresponding to Odžaci IV, although the stress lies on later burials. The cemeteries have been in summary published by S. Karmanski (1975, 7-12; 1976, 1-10). Five Late Avar graves come from Kartonaža (Karmanski / Radojević 1984).

Ruski Krstur (Bácskeresztúr) and Bačko Dobro Polje (Kiskér) are next to present-day marshes as well. From somewhere around Ruski Krstur, there comes a belt set and a golden earring (Mrkobrad 1980, 93 no. 617). It was further considered that Čarnak Gradina in Bačko Dobro Polje could be the location of an Avar settlement whose population used the Polet necropolis in Vrbas for their burials (Nagy 1971, 188).

### The river terraces

The borders of the inundation zones of the Danube and Tisza rivers were attractive to Avar settlers (Takács 2000a, 460). The bottom of the fluvio-marshy environment of the Pannonian Basin is followed in the West and the South by a higher river terrace. From that contact, an Avar grave originates from Doroslovo (Doroszló; Kovács 1991, 418), and from Selenča (Bácsújfalu) comes an accidental find of an Early Avar horseman's grave or a hoard (Csallány 1956, 85; Vinski 1958, 13).

Large areas of the next geomorphological unit – the loess-covered higher river terrace – existed under the marshes in the times of the settling, including the stretch of marshes along the fossil plain. A surface of land of this kind did not represent a uniform farming zone like today, and the settlements were built in places offering possibilities for varied exploitation (Ćurčić / Đuričić 1994, 161).

The location of sparse Avar-time sites in this unit is conditioned by factors noticeable today on the geomorphological map: Kupusina (Bácskertes) is situated at the joint of sand bars, between two dry riverbeds; Prigrevica (Bácszentiván) and Svilojevo (Szilágyi) are located next to waters manifested as marshes today. These are young fossil Danube meanders. Bač (Bács) is built next to the rivulet of Mostonga and surrounded by waters which are also marshes today. The lack of recorded Avar-time evidence is noticeable in the largest, southern part of this geomorphological unit<sup>11</sup>. Sonta (Szonta) is situated between two abandoned riverbeds and marshes. Durđevo (Gyurgyevo) lies among the marshes, at a drain channel. Rumenka (Piros) represents the only place left in Bačka where we have not been able to identify geomorphological positioning conditions.

In Kupusina, an insufficiently defined hoard from the Early Avar time was found, with coins stretching chronologically from Zeno to Phocas (Somogyi 1997, 62). In 1898, a damaged horseman's grave was found in Prigrevica, and another one was found later with relatively rich grave goods (Vinski 1958, 14) which are dated to the end of the 6<sup>th</sup>/beginning of the 7<sup>th</sup> century (Dimitrijević et al. 1962, 55). From Prigrevica also comes a *solidus* of the Emperors Heraclius, Heraclius Constantinus and Heraclionus, minted between 621 and 641 (Somogyi 1997, 73f.)<sup>12</sup>.

There were non-systematic excavations of several Early Avar graves in Svilojevo; but in the vicinity of Sonta, a few graves were recorded and similarly dated (Dimitrijević et al. 1962, 59. 62). In Bač, at the site of Še-

čerana, some graves were recorded (Mrkobrad 1980, 96). We know further Avar graves from Durdevo, the Nikolić (Surkin) Salaš site. A male burial comes from Rumenka, the Kudeljara site (Nagy 1971, 190 no. 29. 34).

The higher river terrace unit for the most part directly borders on the alluvial plain interspersed with swamps and marshes, while in South Bačka, within smaller zones, it borders on the lower river terrace<sup>13</sup>. Bačka Palanka (Bácspalánka) is at the joint of all three geomorphological units, like Novi Sad (Újvidék) further to the East. Probably from the vicinity of Bačka Palanka, there are the accidental finds of *solidi* of Heraclius, Heraclius Constantinus and Heraclionus from 637/638, and of Heraclius and Heraclius Constantinus from 629-631 (Somogyi 1997, 24-26). From Bačka Palanka itself, from the Ciglana M. Šropa site, originate several Late Avar finds<sup>14</sup>. In the vicinity of Novi Sad, at the prehistoric site of Čenej-Rivica, five Late Avar graves were found (Dimitrijević et al. 1962, 36. 53f.; Mrkobrad 1980, 87 no. 573).

On the border of the lower river terrace and the narrow zone of the alluvial plain there, west of Novi Sad, Futog and Begeč (Begecs) are situated. Begeč is also located towards the lower grounds. From Futog, Pašnjak site, come some rare settlement remains which could be linked with the Late Avar period. Two pits were found with pottery fragments of the so-called Danube type, dated to the 9<sup>th</sup> century (Janković / Janković 1990, 116). From several sites in Begeč, poorly documented Avar graves exist, prominent among them a horseman's grave recorded during the survey of the Roman castrum (Mrkobrad 1980, 93 no. 615).

The loess-covered higher river terrace, along the left bank of the Danube, borders mostly on the alluvial plain. Also from that border come Avar-time finds. Besides this main geomorphological determination, Bački Breg (Béreg) borders on an individual sand heap as well; Kolut and Bezdán are situated on an abandoned riverbed, Apatin on the dry drain channel. Bogojevo (Gombos) was located at the water, too: it lies near a dry riverbed and a large marsh. Next to swamps and marshes are Vajska (Vajsza), Bođani (Bogyán) and Plavna, the last one situated in a dry riverbed as well. Vajska and Plavna are also in the most forward positions towards the lower grounds.

In Bački Breg, in the very Northwest of Bačka, at first four Avar graves were recorded (Velenrajter 1968, 214f.), then four more female graves (Mrkobrad 1980, 93 no. 614). From Kolut come, with no further specifications, finds of Avar ceramic vessels (ibid. 103 no. 692). One house and three graves were recorded in the surrounding area, 2 km to the north, at the Ritska Dolina site, dated to the middle of the 6<sup>th</sup> century and ethnically ascribed to the Slavs (Trifunović 1997, 117-119)<sup>15</sup>. It seems that some Avar-time finds originate from Bezdán (Mrkobrad 1980, 107 no. 715). From Bački Monoštor (Monostorszeg), there is another unexplained hoard, containing a gold coin of the Emperor Mauricius Tiberius (Somogyi 1997, 26).

An accidental Early Avar find comes from Apatin, the Dunavska Ulica site, where a Late Avar horseman's grave was found as well. In the same town, several Early Avar graves were excavated at the Sikeš site (Dimitrijević et al. 1962, 33f.). For the subject of our study, the find of a house from the vicinity of Apatin, Magareći Mlin area, is very important. It is an isolated find of a dugout of elongated shape with an oven dug into the northeastern wall. Based on the interpretation of both the pottery and the flow of historical events, Đ. Janković relates this find to the Slavs and dates it before 568 (Janković 1998).

In the area of Bogojevo, several sites of the Avar-time were found. The Bogojevo I cemetery with more than 70 graves was placed in the middle phase of Avar domination, based on the belt sets and bone finds (Dimitrijević et al. 1962, 37-39). At cemetery Bogojevo II, four graves were recorded, and about 220 graves at Bogojevo IV related to the Late Avar period (ibid. 39f.).

The necropolis of Vajska is one of the most interesting in Bačka. It represents an excellent example of processes of acculturation of that time, since burials were made in graves built in the Roman way. Among the finds, objects of Byzantine origin were recorded, as well as those typical of barbarian populations. In total, seven such graves were found, and one simple one. The necropolis was dated to the end of the 6<sup>th</sup>





**Fig. 4** Aerial photograph of the site Čelarevo »Ciglana«. – (Photograph N. Stanojev).

century; it has been published by O. Brukner (1982). In Bođani, prehistoric, Sarmatian and Early Mediaeval finds were observed, and in Plavna »Gradište type« pottery on a natural rise (Velenrajter 1968, 213f.). Čelarevo is a particularly interesting site (fig. 4). In the area of the brick factory, about 650 graves were found, many of them destroyed. The buried population had mongoloid anthropological features<sup>16</sup>. The necropolis had been partially published (Bunardžić 1979) and was mentioned again recently (Gačić et al. 2008, 21-23). The finds that render it so special are the bricks with Jewish symbols, the menorahs<sup>17</sup>. The necropolis and the settlement dated to the 8<sup>th</sup>/9<sup>th</sup> centuries are separated only by the border trench. This settlement is on an average level of 85mNN. The houses are square and dug in the loess; the ovens are also shaped in loess. The superstructures were of wickerwork and thatch, in the form of ridge roofs (Stanojev 1996, 147f.).

From Kovilj, the Ulica Lale Novoselca site, comes an accidental find of a Late Avar horseman's grave in which a sabre was found, together with perforated arrowheads („Brandpfeil«), harness mounts and stirrups (Dimitrijević 1975, 92f.).

### **The border of the alluvial plains and the fluvio-marshy environment in the East**

The overview of the Avar-time sites will now be concluded with the sites located in the East, along the right bank of the Tisza. A concentration of Early Avar sites especially in the inundation zone of the Theiß was noted by M. Takács (2000a, 459). These are mostly sites from the border of the alluvial plain next to the riverbed and the bottom of the fluvio-marshy environment of the Pannonian Basin to the West. From North



**Fig. 5** Contact of the Tisza alluvial plain and the bottom of the fluvio-marshy environment of the Pannonian basin near Perlek. – (Photograph N. Stanojev).

to South, the settlements on that seam are as follows: Kanjiža (Kanizsa), Nadrljan (Adorján), Senta (Zenta), Ada, Mol (Mohol), Bačko Petrovo Selo, Bečej (Óbecse; **fig. 5**), Bačko Gradište (Bácsföldvár) and Čurug. Nadrljan is located at the Kereš-Tisza confluence, Ada at the Budžak and Bačko Petrovo Selo at the Čik confluence with the Tisza. All these settlements were built on the higher geomorphological unit; other positioning determinants – even if present – were not of decisive influence<sup>18</sup>.

It is important to stress that some of these settlements were built on locations corresponding most to the settlement locations on the opposite Banat bank of the river: when an appropriate geomorphological unit existed there, close traffic links with the corresponding opposite settlement were established. The couples of corresponding settlements along the Tisza river (in Bačka and Banat) are Kanjiža / Novi Kneževac (Törökkanizssa), Senta / Čoka (Csóka) and Bečej / Novi Bečej (Ćurčić / Đuričić 1994, 152).

The correspondence of places on the right bank of the Tisza and river sand bars is noticeable. The river sand bars of Bačko Petrovo Selo and Titel remain dry at low and normal water levels, about ten months a year. In the course of some earlier river regulation works, some of the sand bars were connected with the closer river bank (Bukurov 1948, 44-46). The riverbank bars are also worth noting; they are created when in times of high water levels the river floods the surrounding area, leaving coarse sediments next to the river bank, and carrying finer material further afield. The Tisza creates these coarse sediment bars – natural dykes, up to 2-3m high –, thus preventing the return of the flood waters back to the riverbed. Sediment bars form an almost uninterrupted line along the course of the river (ibid. 42).

In Kanjiža, at the Dom Kulture site, a necropolis with 47 graves was recorded, dated to the end of the 7<sup>th</sup> and the beginning of the 8<sup>th</sup> century (Ric 2003, 326. 328). In Nadrljan, two cemeteries have been excavated. From the necropolis Nadrljan I, finds from 39 graves were preserved, with no precise records. Most of them are Early Avar burials, and the material from four graves is Germanic, probably of Gepid provenance. Since there are no field records, it remains unclear whether these represent a special group of graves within the necropolis or if two separate burial horizons are existent. From the Nadrljan II necropolis, a total of probably 52 graves was excavated, with no records again (Dimitrijević et al. 1962, 49-53). At the Bašta Kawai Lasla site, more Avar-time burials were recorded (Mrkobrad 1980, 87 no. 571).

In Senta, at the Ulica 13. Jula site, a Late Avar grave was found (Ric 1997, 205). From the vicinity of Senta exists an accidental find of a strap-end of a late date (Dimitrijević et al. 1962, 58), and a few more finds are from the Senta sites of Veliko Brdo and Makoš (Mrkobrad 1980, 86 no. 554)<sup>19</sup>.

Apart from individual Early Avar finds, graves from the same period have been recorded in Ada, Senčanska Ulica site (Ric 1979, 27). In Ada, at the Petefi Ciglana site, one habitation(?) was excavated in 1951. Amongst the pottery finds, fragments of coarse everyday pottery, two very fine vessels made on wheel and two hand-thrown Avar dishes were recorded (Vukov 1952, 130). P. Ric considers, with some reserve, this site to be a settlement with cemetery (Ric 1979, 27). At the Novo Naselje site, a six graves necropolis was recorded; only one of them was studied and dated to the Late Avar period (id. 2003, 325). A famous silver bowl found in Ada at the Ciglana K. Bakos site is to be mentioned (Nagy 1972, 113 no. 8).

In Mol, at the Ciglana Pionir site, an Avar cemetery was discovered (Ric 1979, 34). N. Vukov also identified settlement objects in the archaeological profiles at this site – habitations and garbage pits (Vukov 1952, 130). A Late Avar strap-end was found at an unknown site (Dimitrijević et al. 1962, 49 Tab. 31/3).

In Bačko Petrovo Selo, Čik site, an Avar-time cemetery was found; it can be dated from 568 until ca. 670/680. Bronze Age pottery in the earthen filling of the graves testifies to the existence of a prehistoric layer<sup>20</sup>. Some graves are damaged by subsequent mediaeval pits. A cemetery from the time of the Avar domination is dug in the zone of Sarmatian burials from the 2<sup>nd</sup> century. A total of 150 graves was recorded (Bugarski 2006). From the area of this village also comes an accidental find of a *solidus* of Heraclius and Heraclius Constantinus, minted in 616-625 (Somogyi 1997, 26f.).

In Bečej, Pionirska Ulica site, the Early Avar graves – virtually all plundered – were recorded, as well as the late ones (Mikić-Antonić 2004, 40). At the nearby site of Perlek, several cultural layers were recorded, ranging from prehistory to the Middle Ages. The Avar-time cemetery is damaged, about 20 graves are preserved. Perlek seems to have been a rather big necropolis, in the second half of the 7<sup>th</sup> and the 8<sup>th</sup> century (id. 2003, 111-142).

At the Bečej-Botra site, traces of a settlement were found. On one of the loess ridges, 100-200m from the bank, one- and two-part houses are dug in the loess, up to 2m deep. Only the ridge roofs were left above the surface. Trenches dug in the loess represent communications and probably defences of the settlement. In the houses, ovens and traces of posts along the shorter sides of their rectangular bases were recorded. The settlement is dated to the 8<sup>th</sup>-9<sup>th</sup> century, with a material culture showing (according to the author) local traditional features as well as Slav – Penkovo and Saltovo – cultures (Stanojev 1996, 26-32)<sup>21</sup>.

South of Bečej is Bačko Gradište. When the canal was dug between these two places in 1900, one golden Avar-time earring was found, now housed in the National Museum in Budapest (Garam 1993, 53 Tab. 1/15). In Čurug, a Sarmatian settlement was recorded in an area inhabited since Bronze Age to the 17<sup>th</sup> century (Trifunović / Pašić 2001).

South of the listed sites, on the very Southeast of Bačka, Mošorin (Mozsor) and Titel are located on the seam of the alluvial plain, the lower river terrace and the loess plateau. These settlements, together with Vilovo, are the only ones in Bačka on the border of the loess plateau and the alluvial plain. They skirt an-



other, smaller loess surface in Bačka: Titelski Breg (*Titel hill*; Ćurčić / Đuričić 1994, 151). From Mošorin, we have some accidental finds, probably Early Avar, and from Titel Late Avar ones (Dimitrijević et al. 1962, 49. 62)<sup>22</sup>.

## CONCLUSION

It is obvious that geomorphological research helps us to understand the conceptions of the use of space and, consequently, the settling of earlier populations in Southern Pannonia. This region looked different at the time of settlement than it looks today, and it offered fewer opportunities for a successful choice of settlement and agricultural production. Hydro-regulatory works in modern times changed the situation, and in locations where previously no such conditions did exist, living was made possible. The former impossibility to exploit wide areas of South Pannonia is first of all related to areas that were under water, or regularly flooded – which prevented any permanent settlement. This is most obvious in Srem, where the Sava river flooded the southwestern part up to 40 km north<sup>23</sup>.

Accordingly, only the edges of the flood area could be inhabited. Since the rivers in Vojvodina changed their courses in the course of time and they were partly regulated in recent times, the geomorphological map is mostly reliable in terms of reading the borders of earlier flood areas. The borders of other geomorphological units were also favourable for settling (as stated above) since more opportunities were present to exploit the terrain. These variations have to do with differences in relief and maybe in the vegetation of the different geomorphological units. It was already stated that palaeobotanical studies are not available at this moment (see note 1).

Comparing the geomorphological matrix with archaeological evidence, one can understand that the inherent logic of the terrain dictated the same choice of settling locations to the old, to the more recent and to the modern populations of Vojvodina alike. In this respect, some nearby finds and sites dated as older and/or more recent than the Avar domination period were cited in this paper only as an illustration of the existing practice to use favourable locations for settling – a comprehensive body of archaeological data was not aimed at.

Places where evidence of Avar presence was found remain the basis of this paper. These are mostly more or less excavated cemeteries and accidental and individual finds. As already mentioned, the number of Avar-time settlements is considerably less than the number of cemeteries found. The simplest explanation is that traces of sunken huts are much more difficult to notice in the course of e.g. farming work than skeletons in a cemetery. However, the recorded number of settlements is on the increase, due mainly to protective excavations along the new motorway works<sup>24</sup>.

In the methodological context, this paper proposes settlement attribution even to locations where only accidental and individual finds were recorded – if the location fits the geomorphological settlement-positioning matrix. This can also be applied to sites where cemeteries were recorded, though in such cases the existence of a settlement has to be assumed in which the people buried there had lived. So when cemeteries are positioned on the borders of geomorphological units, the corresponding settlements are to be looked for on the same seams. The fact that the recorded sites along these contacts correspond to modern settlements testifies that the locations have been chosen very well. However, the possibility that Avar settlements along these contacts existed on locations where there are no modern settlements cannot be excluded.

Within the geomorphological units, the locations of settlements from different periods often coincide as well, conditioned by some micro-relief advantage. The few examples from the interior of the geomorphological units where Avar-time settlements were recorded but no modern settlement exist point to the fact



that a location once chosen was not identified as favourable for settling by later populations. Also in such cases it is probably possible to identify geomorphological positioning conditions for their placing, using small-scale geomorphological maps not used here<sup>25</sup>.

We have pointed out that the Bačka region represents the only part of Vojvodina where the number of present-day settlements along the seams is less than half of the overall number (67, i.e. 40.9%). This fact does not coincide with the archaeological evidence of Avar presence in this area. Avar traces come from 62 places mentioned in this paper<sup>26</sup>. For virtually every place it was possible to analyse the geomorphological conditions for settling, for the settlements along the borders or within the geomorphological units alike.

Of all 62 places mentioned, 39 (62,9%) are positioned on the borders while the remaining 23 (37,1%) are situated within the geomorphological units. These data are derived at a time of an insufficient level of research, but the statistical difference is of such magnitude to justify the claim that in Avar-times Bačka was settled mostly along the borders of geomorphological units. The considerable statistical difference in the case of border settlements in comparison with the present-day situation can certainly be explained as a result of large-scale melioration works.

Besides the conclusion that Avar-time sites were more numerous on the borders of geomorphological units, they are easier to identify there. In this respect, a general methodological remark can be made: by concentrated surveyings along the narrow seam lines, numerous data relative to former settling<sup>27</sup> could most easily be gathered. Next to settlement remains, the corresponding cemeteries are to be expected. This is valid foremost, but not exclusively, for the seam areas where there are no Avar traces yet, but where modern settlements are located, since their positioning itself indicates sites suitable for settling.

One also has to stress the fact that along the same seams and inside the same geomorphological units, traces were recorded which are dated differently. The only exception seems to be the western zone of the higher river terrace, where only material of an earlier date at the sites of Kupusina, Prigrevica, Svilojevo, Sonta and Bač exists. It is interesting here that from the largest (southern) part of this zone there are no recorded Avar-time traces. They are practically absent to the north as well, in the eastern part of the North Bačka loess plateau. These last remarks should be considered with some caution since they may be due to the insufficient degree of research.

However, the positioning of sites in general may lead us to conclude that the Avars used longitudinal North-South communication lines along the Danube and the Tisza rivers, consisting of the places sustainable in a geomorphological sense. A third communication line would be stretching mostly along the course of the Krivaja rivulete in the North Bačka loess plateau and its western border. The earliest Avar traces positioned along these lines will be elaborated in greater detail in another paper.

## Notes

1) This approach was presented in the author's M.A. thesis (Bugarski 2006). The author wants to thank M. V. Milošević from the Geografski Institut SANU for his advice, N. Stanojević from the Muzej Vojvodine for the illustrations and N. Borić from the Arheološki Institut for processing them. Furthermore, the author wishes to express his gratitude to R. Schreg and J. Drauschke from the RGZM for some very important editorial notes in the introduction.

2) According to the ideas of A. Kiss, the withdrawal of the Skirs from southern and eastern Bačka to Italy in 469, together with the fact that the settling of northern Bačka by the Gepids in the second half of the 5<sup>th</sup> and the first half of the 6<sup>th</sup> cen-

turies was not that intensive (see notes 5 and 11) leaves the area in question as an uninhabited (sic!) buffer-zone between the kingdoms of Gepids and Lombards upon their arrival in 469 in Eastern Pannonia. The territory remains uninhabited after the Lombards' depart for Italy in 568. Only when they suffered a defeat at Constantinople in 626 with the subsequent calming down of the situation in the Khaganate, the Avars concentrated on this area, and only then more intensive settling followed (Kiss 2003, 188). On the other hand, Sarmatian presence in southern Bačka during the third quarter of the 5<sup>th</sup> century was suggested and the small number of Gepid finds in this area explained by the assumption that the Tisza river presented the ethnic if not political border of Gepid land

- (Dimitrijević 1975, 82f.). The idea that the Avars conquered uninhabited land was not followed by R. Kory (2002, 614).
- 3) »Bačka« entry. In: Mala enciklopedija Prosveta (Beograd 1978).
  - 4) The authors also deal with geomorphological conditioning of the shape and structure of settlements. Due to the lack of more substantial archaeological data relative to settlements in Southern Pannonia from the times of Avar domination, these aspects cannot be discussed here.
  - 5) Kelebija and Subotica are two sites included by A. Kiss (as southernmost points) within the group of settlements that formed the zone of Gepid settling along the right bank of the Tisza in the second part of the 5<sup>th</sup> and first part of the 6<sup>th</sup> centuries, and leaning directly to their area in Banat set up after the death of Attila. These two places being somewhat remote from the right riverbank indicate that the area of Gepid settling between the Tisza and the Danube was up to 40km to the west (Kiss 2003, 186. 188. 190f. Abb. 1). A gold coin of Zenó was found in Kelebija (Kiss 2003, 190), and a female grave comes from an unknown site in Subotica (Dimitrijević et al. 1962, 61).
  - 6) From this area, there is also a big Sarmatian Subotica-Verušić cemetery with additional 11<sup>th</sup> century burials (Sekereš 1998, 116). A few kilometres north of Subotica in the direction of Palić, the remnants of a Sarmatian settlement were found (Đorđević 1990, 119); at site no. 31 a settlement was registered with Sarmatian and Germanic pottery (Milenković 1990, 124. 128). Traces of a Late Sarmatian settlement were recorded at the Palićke Ugarnice site (Anđelić 1999b, 120-122).
  - 7) The Stub 76 site previously was dated to the end of the 4<sup>th</sup>/5<sup>th</sup> century (Trifunović 1998, 40). There are also two Sarmatian settlements from the vicinity of Horgoš, sites 67 and 80 (Đorđević 1990, 119-121).
  - 8) In the vicinity of the necropolis, several dugouts dated to the 11<sup>th</sup>-12<sup>th</sup> century were recorded (Szekeres 1978, 160).
  - 9) The oldest settlement, the Sarmatian one, is from the 4<sup>th</sup> century; the most recent one consists of three objects and is dated to the 11<sup>th</sup>-12<sup>th</sup> century (Anđelić 2003, 369. 374).
  - 10) At the Ciglana site in Gakovo, a multi-layered prehistoric settlement was recorded as well as Sarmatian finds (Velenrajter 1968, 213).
  - 11) However, there is Kisač, northwest from Novi Sad – located at the drain channel and next to a marsh – where a *solidus* of Theodosius II was found. From Zmajevo, lying on the border of this geomorphological unit and the bottom of the fluviomarshy environment in the Pannonian plain, and from three other sites further to the northwest – Bački Monoštor, Sombor and Kolut – originate the finds used by A. Kiss to reconstruct the zone of Skir settling during the second third of the 5<sup>th</sup> century. Based on historical sources and archaeological evidence treated in this way, the Skir area is located on the left bank of the Danube, 30km in width, from the southern end of the river sand bar of Csepel to Novi Sad (Kiss 2003, 185f. 188. 190 Abb. 1). D. Dimitrijević, on the other hand, attributed to the Skirs only the Bački Monoštor necropolis (Dimitrijević 1975, 82 no. 38).
  - 12) In respect of this coin find, probably due to the existence of two graves in Prigrevica, Mrkobrad (1980, 107) declared it a burial find, not quoting any sources.
  - 13) On the seam of the lower river terrace and the alluvial plain are Mošorin and Titel in the very southeast of Bačka, but they will be dealt with later in the context of settlements along the Tisza river.
  - 14) In the area of Bištanske Salašine near Bačka Palanka, a medi-aeval settlement was found from the end of the 13<sup>th</sup> and the beginning of the 14<sup>th</sup> century. Bronze Age ceramics were also found (Anđelić 1999a, 112-119).
  - 15) At this site, a late La Tene or early Roman layer was confirmed, while at the nearby site of Bačan, a Starčevo culture layer and a dugout(?) dated to the late 5<sup>th</sup>/early 6<sup>th</sup> century were noted (Trifunović 1997, 115-119).
  - 16) Judging by anthropological parameters, a stable population of the mongoloid type, relatively long-living, was buried in the cemetery (Živanović 1973, 160). Based on the <sup>14</sup>C-dating of the random osteological material, the buried population is from the 10<sup>th</sup> century (Živanović 1978, 19f.). Judging by the archaeological material, this dating is not correct, however. A population buried in graves marked by menorah bricks has not been attributed in the anthropological sense yet (Gačić et al. 2008, 22).
  - 17) One part of the finds discovered corresponds completely to the Late Avar period. Thanks to menorah bricks, one part of the buried population is likened in the ethnic sense to one of the Turkish tribes that converted to Judaism before arriving in the area. Arab-Khazar conflicts in the Caucasus could have resulted in the resettling of some independent Jewish populations originally living there. This conclusion is corroborated with the finds of Arab, Abbasid coins. The third group of graves is a Slavic one. The dead were cremated and buried in urns (Stanojević 1996, 147f.; Gačić et al. 2008, 21f.).
  - 18) The lower geomorphological unit of this seam is the Tisza alluvial plain which gradually slopes down towards the mouth of the river: the altitude at Szeged is 82 m and at the confluence with the Danube 79 m (Koščal / Menković 2005, 14).
  - 19) In Senta, some older finds of Germanic attribution were recorded (Mrkobrad 1980, 50. 54 no. 319. 358).
  - 20) In Bačko Petrovo Selo, at the Vinogradi site, even earlier, Neolithic traces were recorded. This was presented by Lj. Babović in Subotica at the annual meeting of the Serbian Archaeological Society in 1998.
  - 21) At the Botra-Zidar site and at two other sites around Bečej – Donje Ugranice and Beljanska Bara –, Sarmatian settlements were also found (Mikić-Antonić 1989).
  - 22) Near Mošorin, Bostanište site, a necropolis with material typical of the 4<sup>th</sup> century was found (Đorđević 1990, 122). A settlement from Bosanište site near Mošorin was also published. It was assessed in the older literature as an Old Serbian settlement (Veselinović 1953) and as a Sarmatian one in more recent publications (Takács 2000b, 409).
  - 23) The massive flooding of Srem was illustrated recently, using the source – a section of the map – also presented here (fig. 1; Borić 1996, 67f.).
  - 24) In Hungary, while the M5 motorway was being built in the north in the Csongrád area between the Danube and the Tisza, 350 settlement structures were recorded at three sites. They are mostly linked to the Avar domination period (Válay 2003, 43f.). While the Budapest-Vienna motorway was being built, the biggest Avar settlement so far was discovered near the town of Lébény. It consisted of around 800 objects dated to the 7<sup>th</sup>-9<sup>th</sup> centuries (Takács 1996, 379; Daim 2003, 484). The settlements in the North Bačka loess plateau mentioned here were recorded in the same way (Anđelić 1994). This is also the case with the settlement in Adaševci in Srem – n.b. positioned on the border of geomorphological units. Three pits and one oven were recorded, with the remains of adobe

and fragments of so-called Danube and yellow pottery (Minić 1995, 249-255). Judging by the pottery, the settlement in Adaševci is dated to the 8<sup>th</sup> century. The author rightly retained from any ethnic attribution since the number of finds was little. Since the so-called yellow pottery was present, we might assume that it was an Avar settlement.

25) Detailed geomorphological maps for the territory of Vojvodina were made in the 1:50 000 scale according to uniform methodology (Ćurčić / Đuričić 1994, 147).

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26) It is important to note that this number is not the total sum of sites but of places (towns and villages) where the sites are – in some places there are several sites.

27) In this respect, we may quote S. Trifunović who noticed, when commenting on the results of successful surveyings of the Alibunar municipality in Banat, that »the sites registered are positioned on the line of the north-eastern border of the Deliblato sand, on which most of the villages of the Alibunar municipality are still situated today« (Trifunović 1990, 99).

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### *Zusammenfassung / Abstract / Résumé*

#### **Die geomorphologische Matrix als Ansatz zur Bestimmung der Lage awarenzeitlicher Siedlungen in Pannonien – das Beispiel der Bačka**

Ein Einblick in die Ergebnisse geomorphologischer Untersuchungen hilft, das Konzept bei der Besiedlung frühgeschichtlicher Bevölkerung im südlichen Pannonien zu verstehen. Damals sah diese Region anders aus als heute. Dank moderner wasserbaulicher Maßnahmen wurde im südlichen Pannonien ein Überleben möglich gemacht, wo vorher regelmäßige Überschwemmungen eine Besiedlung verhinderten. Damals konnten nur die Ränder der Überschwemmungszone besiedelt werden. Die Randbereiche geomorphologischer Einheiten begünstigten die Besiedlung, weil hier mehrere Möglichkeiten der Ressourcennutzung bestanden. Da awarenzeitliche Fundstellen in der Bačka in der Regel an diesen Übergangsbereichen liegen, d.h. an im geomorphologischen Sinn siedlungsgünstigen Orten, wird hier auch für die Fundstellen von Zufalls- oder Einzelfunden ein Siedlungscharakter vorgeschlagen.

#### **The Geomorphological Matrix as a Starting Point for Determining the Position of Avar-time Settlements in Pannonia – the Example of the Bačka Region**

An insight into the results of geomorphological research enables us to understand the settlement concepts of earlier populations in South Pannonia. At this time, the region looked different than today. Thanks to modern hydro-regulatory works in Southern Pannonia, settlement was possible in locations where it had not been previously because of regular flooding. In former times, only the edges of the flood area could be settled. The borders of geomorphological units were favourable for settling, due to the existence of more opportunities to exploit the ground. Since the Avar sites in the Bačka region were mostly located on such seams, i.e. on the places sustainable for settling in the geomorphological sense, this paper suggests the existence of settlements even for sites of accidental and individual finds.

#### **La matrice géomorphologique comme déterminant de l'implantation des habitats avars en Pannonie – l'exemple de la Bačka**

Un regard sur les résultats d'analyses géomorphologiques récentes dans le Sud de la Pannonie nous aide à comprendre les logiques d'implantation des populations anciennes. La région était alors différente de son aspect actuel. Des travaux hydrauliques modernes ont permis d'habiter le Sud de la Pannonie qui a longtemps été hostile aux implantations du fait de fréquentes inondations. A l'époque, seul le bord des zones inondables était propice à l'habitat. Les zones limites d'unités géomorphologiques différentes favorisent les implantations car plusieurs types de ressources y sont disponibles. Dans la mesure où les sites avars de la Bačka se trouvent généralement sur de telles interfaces – c'est-à-dire les zones propices d'un point de vue géomorphologique –, les découvertes isolées ou fortuites en provenance de ces zones peuvent être considérées comme des habitats.

L. B.

### *Schlüsselwörter / Keywords / Mots clés*

Serbien / Frühmittelalter / Awaren / Geomorphologie / Besiedlung  
 Serbia / Early Middle Ages / Avars / geomorphology / settlement  
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In Neupotz, Lkr. Germersheim, Rheinland-Pfalz, hat man in einem Baggersee des Kieswerkes der Gebr. Kuhn seit 1967 und dann besonders von 1980 bis 1983 zahlreiche Metallobjekte bergen können. Die Fundstelle liegt im alten Strombett des Rheines.

Der riesige Fund wiegt mehr als 700kg, die über 1000 Objekte gehören vorwiegend in das Römerreich des 2. und 3. Jahrhunderts n. Chr.: Münzen, Waffen, Reste von Booten, Tafelgeschirr, Küchengerät, Wagenteile und Werkzeuge.

In den Jahren 275-277 n. Chr. plünderten Franken und Alamannen das römische Gallien bis zu den Pyrenäen. Kaiser Probus trieb dann 277/278 die letzten Franken und Alamannen über den Rhein zurück. Der Neupotzfund gehört zu Alamannen, die damals mit massenhafter Beute beladen zurück nach Hause ins Neckargebiet fahren wollten. Beim Übersetzen über den Rhein beim heutigen Neupotz ging der Transport unter. Der Baggerfund von Neupotz ist im Rahmen der römischen wie der alamannischen Archäologie einmalig.



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