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Limes XXIII

Proceedings of the 23rd International Congress of Roman
Frontier Studies Ingolstadt 2015

Akten des 23. Internationalen Limeskongresses in Ingolstadt 2015

BEITRÄGE ZUM WELTERBE LIMES

Sonderband 4/I

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The “Devil’s Ditch” – A Late Roman Limes in the Middle of Noricum?

ZUSAMMENFASSUNG

Ein außergewöhnliches Bodendenkmal ist in Bachsdorf (Gem. Lebring-St. Margarethen, Steiermark/A) noch einigermaßen gut erhalten. Es handelt sich um das Teilstück einer Wall-Graben-Anlage, die sich einst über etwa 3,7 km von der Mur im Osten bis zur Laßnitz im Westen hinzog und deren Forschungsgeschichte bis mindestens in die erste Hälfte des 19. Jahrhunderts zurückreicht. Heute ist die im Volksmund als „Teufelsgraben“ bekannte Anlage über weite Strecken eingeebnet, zugeschüttet oder gänzlich zerstört, doch fungiert der 982 n. Chr. erstmals in einer Urkunde Kaiser Ottos II. genannte Graben seit Jahrhunderten als Gerichts- bzw. Verwaltungsgrenze. Im Jahre 2005 führte der Verein Kulturpark Hengist schließlich eine archäologische Ausgrabung durch, deren Auswertung eine spätantike Zeitstellung des Erdwerkes (um etwa 400 n. Chr.) wahrscheinlich machte. Höchstwahrscheinlich hatte dieses eine gewisse Wach- bzw. Warnfunktion für das spätantike *Flavia Solva* bzw. die teils kontemporäre Höhensiedlung auf dem Frauenberg bei Leibnitz.

INTRODUCTION

A remarkable archaeological site is still well preserved in Bachsdorf (Borough of Lebring – Sankt Margarethen) in a rural part of southern Styria¹. A part of a combined earth bank and ditch system is located south of Styria’s capital, Graz, in what was the Late Roman province of Noricum Mediterraneum (Fig. 1). It was once part of a larger feature connecting the rivers Mur to the east and the Laßnitz to the west. Today the system, which is locally called the “Teufelsgraben”/“Devil’s Ditch”, has been mostly filled in, levelled and therefore destroyed; it does, however, still function as a boundary as it has done for centuries. During the late summer and early autumn 2005 an excavation by the non-profit association “Kulturpark Hengist” (Wildon, C. Gutjahr) was carried out to examine the secrets of the Devil’s Ditch.

This article reviews the original purpose and function of the monument, its builders and interpretation. The authors would rather call it a bank-and-ditch system and not a rampart, since there is no additional wooden defensive structure documented or preserved.

EXCAVATION 2005

The so-called Devil’s Ditch was originally built between the rivers Mur in the east and the Laßnitz in the west. A distance of about 3.7 km was covered, of which 1.2 km

have survived. Up to now the original earthwork can be confirmed along about three quarters of its original distance, either because it is preserved or in parts because the analysis of historical documents makes it plausible. Even today the ditch marks the boundary between the boroughs of Lebring-St. Margarethen and Lang to the north and those of Gralla and Tillmitsch to the south. The first kilometre runs northeast to southwest from the River Mur, a section referred to as Devil’s Ditch East. It takes a sharp turn and then runs from east to west towards the River Laßnitz; this part is referred to as Devil’s Ditch West. Approximately 100 m of the eastern part, just south of Bachsdorf, is badly preserved. A very shallow ditch is all that remains, sometimes accompanied by a small ridge to the south, the last remnant of the southern bank. The next part of the Devil’s Ditch just south of Bachsdorf to the west cuts through a forest. Measuring about 400 m in length, this is the best preserved part of the site with a ditch up to 16 m wide. It is 1.4 m deep in parts with an inner width of 6 m, while the southern bank’s width is 5.5 m at the base and 1.5 m at its preserved top. The preserved height measures approximately 1 m. The northern bank is not so well preserved, having a base 3.5 m wide and 0.7 m high. The excavation of 2005 was carried out in this eastern part of the Devil’s Ditch. In 1938 a small-scale trial-trench was opened by Walter Schmid, the archaeologist of the former Landesmuseum Joanneum (State Museum Joanneum), yet it was poorly documented and the results are questionable. Because of this, in 2005 an excavation was conducted in the eastern part running northeast-southwest in Lebring and Gralla south of Bachsdorf². Two trenches were excavated to obtain the section and other information on the construction of the banks. As the results show, both banks were built using the material dug out of the ditch. Any stones found in the excavation material are not linked to a wall construction as interpreted by Schmid (Figs. 2–5).

The western part of the ditch, some 700 m long, also runs through a forest, between a road (L602) and the River Laßnitz. It lacks the impressive dimensions of the eastern part at Bachsdorf. In parts the ditch is hardly visible and resembles more of a shallow rivulet. Here, a northern bank is not preserved and probably never existed, but the southern bank is at least partially in very good condition with a preserved height of 0.5 m and a width ranging from 3 to 4 m (Fig. 6). The ditch has been eradicated by a gravel pit about 200 m east of a dried-up channel of the River Laßnitz.

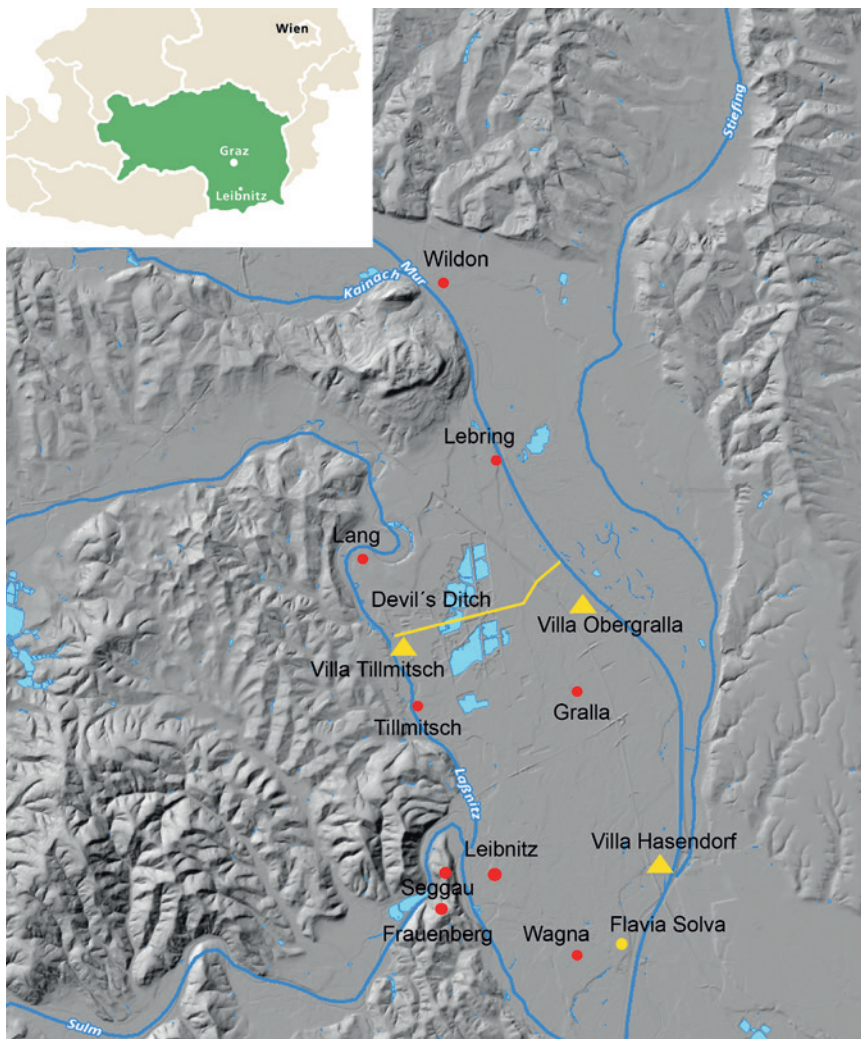


Fig. 1: Map of the „Leibnitzer Feld“ in southern Styria with the “Devil’s Ditch”. 3D-relief of the ALS-data. Yellow: Roman structures, triangle: Roman villa, circle: Municipium Flavia Solva, line: Devil’s Ditch. Red circles: modern villages and towns (Source: GIS Steiermark, Illustration by Kulturpark Hengist).

The cross-section of the excavation reveals a ditch with inclined sides and a flat bottom. The excavation of an anticipated V-shaped ditch with the same width and slope inclination, which would then have been about 4 m deep, was not possible because of the gravel in the ground³.

EARLY RESEARCH

Research started as early as the first half of the 19th century and shows rather strange results. The Devil’s Ditch has always been of major interest not only for researchers but also for local historians and people casually musing about the site. The early interpretations of the late 19th and early 20th century describe a Roman watercourse from the River Mur to the River Laßnitz, a Roman irrigation system, supposedly even for Roman rice-fields. In 1922 Walter Schmid called the Ditch the southern border of Styria, in 1938 he wrote about a “very valuable monument” and “the oldest southern border of the German Reich” – clearly influenced by the contemporary diction. All his conclusions follow a misinterpretation: the Devil’s Ditch is not aligned towards the south as he thought, but towards the north. This is rather obvious, since the higher and wider bank is located south of the Ditch and in those parts where only one bank was erected it lies towards the south.

A local historian and headmaster, Eduard Staudinger, began research on the Devil’s Ditch some twenty years after Schmid. He states that the western part of the system is aligned towards the north, which still has to be considered. He was the first to take into consideration that there might be a connection with two Roman sites. There is a well-known Roman villa at Obergralla, directly south of the Devil’s Ditch; in 1953 a second one was discovered in Tillmitsch. This second villa lies also directly south of the Devil’s Ditch in a corner formed by the River Laßnitz and the Devil’s Ditch directly on the bank of the River Laßnitz (Borough of Tillmitsch). Staudinger assumed that the ditch in Bachsdorf was used as an irrigation system for a Roman *vicus* in Gralla (sic! He meant the villa) and together with the ruins of those Roman villas mentioned above at the latest in the 10th century as a border to the north for the territory of the Archbishop of Salzburg around Leibnitz.

Clearly, the interpretation as a Roman bank-and-ditch system is old and was only extended to the Early Middle Ages from the 1930s onwards⁴.

LITERARY SOURCES AND THE USE AS A MODERN BOUNDARY

The monument is mentioned in various literary sources, the oldest solid evidence being a charter from 18th

May 982, issued by Emperor Otto II to Archbishop Friedrich of Salzburg. It confirmed Salzburg’s territory in the east and defines the ditch as the northern border of the so-called *civitas Zuib/Zuip* in the area of the modern-day District of Leibnitz: “[...] *illa fossa que incipit de Muora et tenditur vsque ad Luonznizam* [...]” This charter is followed by six other sources dating from AD 989 to 1199 using almost identical wording⁵. The authenticity of another, earlier charter by Otto II to the Archdiocese of Salzburg from 1st October 977 at Passau is not undisputed.

It is clear that the ditch was a famous landmark from the 10th century onwards for example as a border between district courts, parishes, the counties of Graz and Maribor/Marburg an der Drau or as a communal boundary⁶. The Devil’s Ditch is missing on the well-known map of Georg Matthäus Vischer (1678) and also on the first cadastral map (Riedkarte zum Franziszeischen Kataster) from 1824. It was also not included in the “Josephinische Landesaufnahme” (“Josephinian Cartographical Register”) of 1787 which is rather curious, considering the military background of that map. But at least the eastern Bachsdorf section is clearly shown in the so-called “Murstromkarte”, a hydrological map of the River Mur from 1820 (Fig. 7).⁷

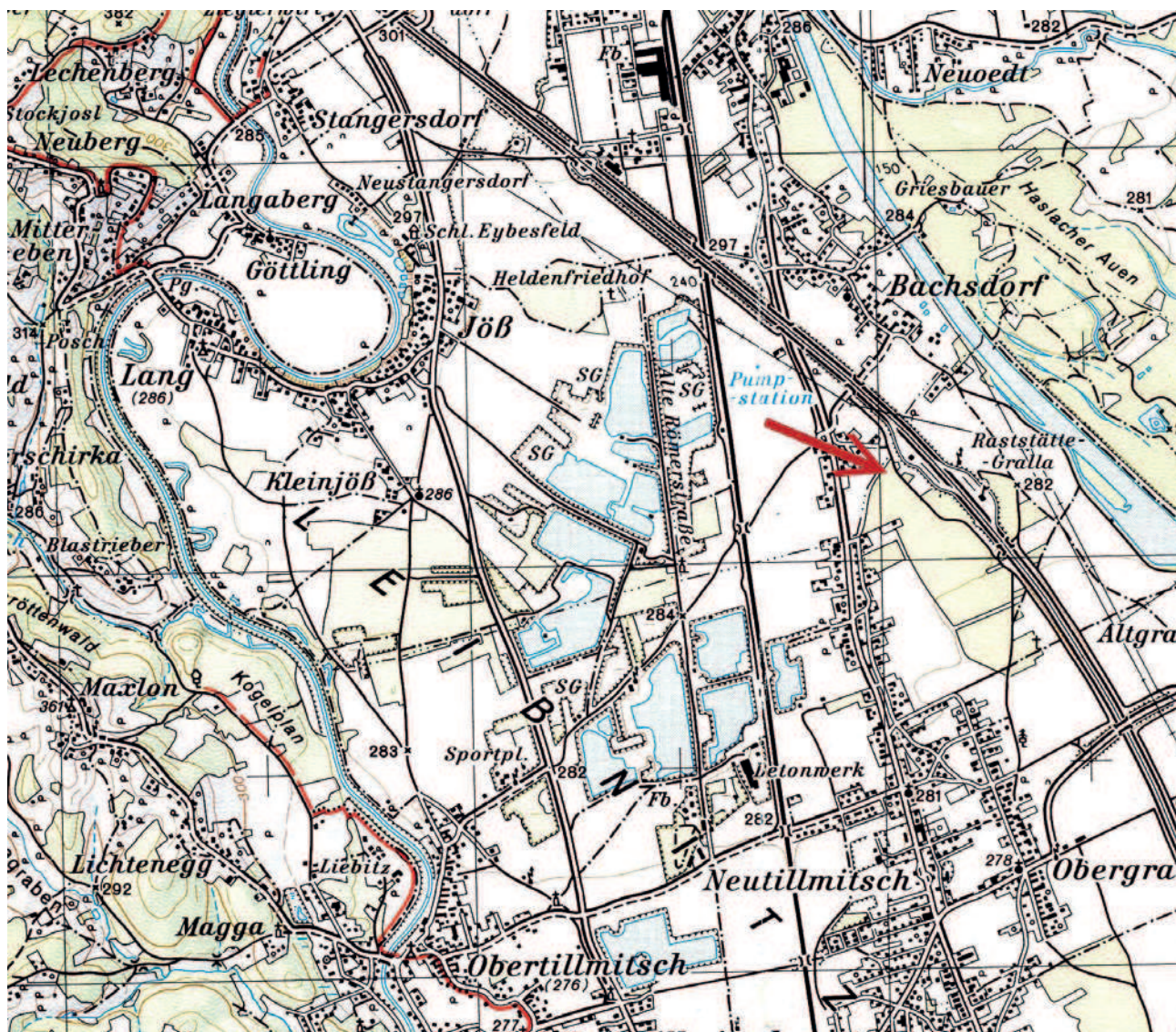


Fig. 2: The marked municipal boundary (— · — · —) largely corresponds to the course of the “Devil’s Ditch”. The arrow points to the excavation site of 2005 (Source: Detail of ÖK 50, sheet 190 [Leibnitz]. © BEV. Illustration by Kulturpark Hengist).

BUILT BY THE ARCHBISHOP OF SALZBURG?

From historical sources it is clear that the ditch already existed in the 10th century. However, was the earthen bank-and-ditch system built by the Archbishop of Salzburg? And was it explicitly excavated as a border ditch and erected as a border marker by him? Or was there another purpose?

A charter of Otto I in 970 mentioned a territory *civitas Zuib/Zuip*. Its northern boarder, according to the charter of 982, was formed by the Devils’s Ditch a boarder which could have been already marked by a bank-and-ditch system. The territory of the said *civitas* matches the so-called Leibnitzer Feld, the plains south of Graz, where *Flavia Solva* used to be. The centre of the territory was situated on the Frauenberg mountain near Leibnitz. The *civitas Zuib/Zuip* would have comprised the area of modern-day Tillmitsch, Gralla, Leibnitz und Wagna.

But even from a historical point of view there is much that stands against a dating to the Early Middle Ages and the Archbishop of Salzburg as its builder:

- The construction faces the north. Its southern bank is clearly higher (Bachsdorf) and in the area of Jöb only the southern bank was built. Thus, the earthwork was erect-

ed to prevent assaults from the north and not from the south. In the Early Middle Ages there was no potential enemy in the north, because the archbishops were closely related to their northern neighbours, the Aribonen. For example, Archbishop Hartwig of Salzburg was from that family and that branch of the family owned the land directly north of the Devil’s Ditch. It is clear that a defence against themselves seems rather foolish. Also, there would not have been enough men to man the defences along the whole Devil’s Ditch.

- The linear border system marks the end of a long-term development. First, there was a border marked by topographic features like rivers or mountains. In some cases prehistoric or Roman monuments such as burial mounds marked borders. In short, an artificially made, linear border, *per se*, does not correspond to early medieval ideas of boundaries or borders, as fences do.
- In regard to the possibility of a connection with Salzburg, it is remarkable that in all historical sources no names of the builders or of an archbishop as an employer or a reason for building the Devil’s Ditch is given. A reference such as “*fossa nova*” or “*fossa nostra*” is missing and even if an original document giving reference to a reason was



Fig. 3: Section across the Devil’s Ditch in Bachsdorf, “Southern bank”. View from SE Southeast (Picture by Kulturpark Hengist [H. Kern]).

lost between 970/977/982, younger documents should have mentioned it and the proper terms would have been used.

- The construction of this earthen bank-and-ditch system necessarily required an exact topographical survey and an adequate amount of men to build it. The Archbishop of Salzburg as territorial lord during the late 10th century might have had both enough men and the logistic potential to build such a defensive fortification, but the area was hardly populated during this period. A functional community – with appropriate experience – was clearly essential for the necessary organizational efficiency – and neither is documented for the area in the Middle Ages.
- The significance of the ditch as a landmark is clearly a fact from the 10th century onwards, so much so that it became a boundary with legal significance. Comparable earthworks with ditches and banks – so-called “Landwehren” (defensive earthworks) from the Middle Ages – date back only to the 13th century.

So, in the light of these facts, how is the fortification, if we can call it that, to be dated?

An interpretation as an Early Middle Age boundary seems unlikely. Obviously, the system was already there when the definition of a boundary or border for the Archbishopric was necessary. The anthropogenic origin of the Devil’s Ditch was obvious to the archbishop, but still it was used similarly to the natural features, just like a river, for the definition of the border. It also might be possible that the ruins of those two Roman villas – especially the one in Obergralla – were still visible during the 10th century. They would have been perfectly prominent markers for a border⁸.



Fig. 4: Section across the Devil’s Ditch in Bachsdorf, “Northern bank”. View from NE Northeast (Picture by Kulturpark Hengist [H. Kern]).

LATE ROMAN ORIGIN?

It looks like the Devil’s Ditch was built during Late Roman times. A prehistoric dating is not plausible and also from the 1st to the 3rd century AD there is no reason for such a bank-and-ditch system to exist. Luckily, two samples of charcoal could be extracted during the 2005 excavation – one dating to the time of use and the other dating to the first filling of the ditch. Radiocarbon dating provided a date in Late Antiquity between AD 380/392 and 430/450⁹. Historic and archaeological sources help to interpret these results. During recent years it became clear that a military presence in *Flavia Solva* and/or on the Frauenberg mountain seems possible. A garrison in *Flavia Solva* during the late 4th or early 5th century AD has already been mentioned by S. Ladstätter¹⁰. S. Ciglenečki supposes a small settlement with military presence on the Frauenberg¹¹. From the Late Roman cemetery on the Frauenberg (Perlacker/Stadlacker) military equipment is also known and illustrates the close intercultural connection between the province and the Barbaricum. Weapons, fibulae and distinctive belt buckles usually linked with military personnel of Germanic origin were found¹².

Also, S. Karl recently confirmed a *monopyrgium* on the Seggauberg for which also a military detachment at *Flavia Solva* would have been necessary, because such a fortlet needed organization and planning on a military scale. Similarly, fortlets and forts along the Limes were built by special detachments/*vexillationes* sent for that reason only. The main purpose of the fortlet was to secure the remaining Late Roman settlement of *Flavia Solva*, the crossing of the River Mur near *Flavia Solva* and the route through the Mur Valley¹³.

The effort for the building of the Devil’s Ditch can be calculated as follows (Fig. 8): For the part between the River Laßnitz and the centre (at the so-called Landgerichtskreuz near the modern-day Borough of Jöß) some 5,500 m³ of material needed to be removed for a 1 km long stretch of the ditch with a cross-section of 5.5 m². E. Treptow calculates the performance of one man for one hour digging through loam at 0.6 to 1 m³¹⁴. So, if 50 men worked a ten-hour day, they would have taken 14 days to complete 1 km of the bank-and-ditch system. For the significantly larger part near Bachsdorf the effort has to be thrice or four times as much. Considering this, a construction by military personnel accustomed to such labour under pressure of time is highly probable¹⁵.



Fig. 5 : Devil's Ditch in Bachsdorf. Trench 1 (2005), „Eastern section“ (Illustration by Kulturpark Hengist).

BORDER CONTROL?

It is highly plausible that on the one hand the *monopyrgium* on the Seggauberg, dated by Karl to the middle of the 4th century AD, and on the other the Devil's Ditch in the plains show two contemporary monuments also connected in their use. This would also support the assumed garrison on the ridge of Frauenberg-Seggauberg during Late Roman times.

The strategic positions of *Flavia Solva* and the settlement on the Frauenberg and the Seggauberg are rather obvious, because the whole area of the Leibnitzer Feld can be monitored. Important routes crossed the area, even if they were not major routes. During Late Antiquity they gained in importance, because they offered alternative routes to the major ones to Italy. A system of small forts or fortlets of varying nature was investigated in Slovenia in recent years along such an alternate route¹⁶.

Clearly, the Devil's Ditch was never intended to be defended; it was also not intended to prevent large war-bands or armies from crossing the border. But against a small host or bandits like *hostes Norici* or *Pannonici* it might have proved its usefulness. There is a similar situation, although dating to another time, on the Upper German-Raetian Limes: at the end of the 2nd century AD a rampart-and-ditch system replaced the wooden palisades along the Limes in Germania superior. Was this ditch meant as a boundary or an obstacle? E. Schallmayer points out that the rampart and ditch were no additions to the wooden structures, but were rather used as a visible boundary and to deter bigger groups of people with baggage from crossing over. They would have been noticed and, thus, to avoid problems, such groups were forced to use the crossing-points near the forts¹⁷. This is a system that is also comparable with the so-called “Landwehren” in the Late Middle Ages.

Structurally comparable constructions much closer in date to the Devil's Ditch lie in the southern Slovakian region, in the southern Danube region in Wallachia, in Serbia¹⁸ and in northern Bulgaria. The so-called “Langwälle” (Long walls) were built in the 4th century AD or the onset of the Early Middle Ages and, therefore, are about 100 years older than the ones in Styria (*limes Sarmatiae* in the Hungarian lowlands). U. Fiedler now states, unlike others such as S. Soproni and Z. Visy¹⁹, that most of the bank-and-ditch systems along the Lower Danube, including the ramparts/embankments/banks of Brazda lui Novac du Nord and Brazda lui Novac du Sud in Walachia (i. e. Constantine's Wall) are connected with the Proto-Bulgarians, whereas those in the Middle Danube region are linked to the Avars²⁰.

Earthen banks comparable in size and located in western England and Wales are much more recent than the Devil's Ditch: clearly, the Devil's Ditch is not comparable to the large ones such as “Offa's Dyke”²¹, but rather with ones like Nico Ditch near Manchester, which at 9.7 km is about three times as long as the Devil's Ditch, but has similar measurements. Dating between the 5th and 11th century it is considered to have been intentionally built as a boundary marker²². The Devil's Dyke in Cambridgeshire was constructed to control trade and access, as well as being a military or defensive barrier. There have been several archaeological ex-

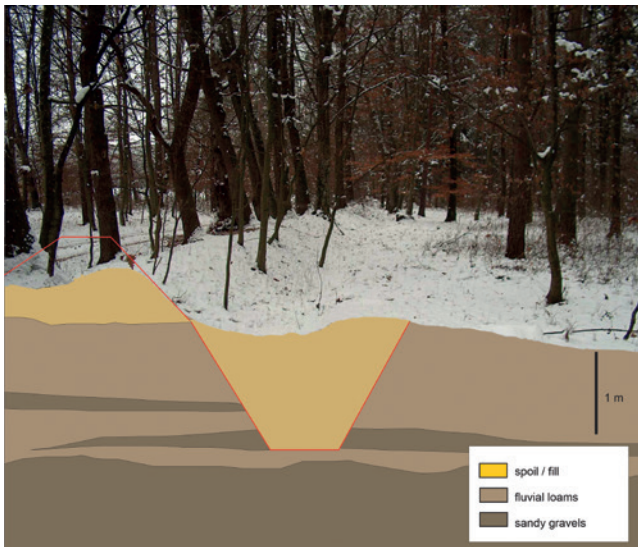


Fig. 6: Reconstruction drawing of the bank-and-ditch system in the area of Laßnitz/Jöb (Illustration by H. Hiden).

cavations along the Dyke in the 20th century confirming a construction date in the 5th or 6th century AD²³.

Their purpose is also unclear and subject of ongoing discussions²⁴. Being more recent, they also seem to point to a similar problem, namely, that of a more or less Romanized population being confronted by immigrants from Germanic tribes. Some of these earthworks utilized old hill-forts in their defensive systems and Roman roads were used as connecting lines between sections of the earthworks. Some clearly were defensive obstacles while others only served as a visible demarcation boundary.

CONCLUSION

The Devil’s Ditch, when considered as a Late Roman, combined earthen bank-and-ditch system is unique in the southeast Alpine region. It has to be regarded in close relation to the area of *Flavia Solva*, forming the northern border of the settlement area during the 4th and 5th century. Late Antique linear fortifications are usually exclusively part of the Limes along the border of the Roman Empire, but within a province only as an exception.

During the period of its use between AD 380/392 and 430/450 military presence in the area was dwindling, but a functional administrative and military structure still existed, even if it was only partially intact. The main Roman road towards the *municipium Flavia Solva* to the south cuts through the Devil’s Ditch in an area where a “Landgerichtskreuz” (an assizes’ cross), survived. The boundary cross was built in the 17th century to mark the boundary between the two old regional courts of Oberwildon and Seggau. Thus, the road clearly was incorporated into the area controlled by the Devil’s Ditch. Building characteristics and technical details strongly point to a functional communal and/or military system that constructed the earthwork using very good technical knowledge and highly organized and skilled human resources. In addition, the growing need of organizing and controlling transportation routes in the Roman Empire within its shrinking borders can also explain the need for this monument.



Fig. 7: Detail of the map of the River Mur („Murstromkarte“) from 1820 with marked Devil’s Ditch as the border between the communities of Bachsdorf and Ober Kralla (modern Obergralla); sheets 185–186, 188 (Source: Styrian State Archive).

The main purpose of the Devil’s Ditch was not military or as a defensive fortification. The dimensions are rather insignificant when it comes to being used as a defence against a larger army or host, all the more so since it is only an earthen bank-and-ditch system. Maybe an equestrian troop could have been somewhat delayed, as it would have had to dismount to cross over, or it could have held a smaller group of infantry, but nothing more. Rather, it seems more likely that it was a border used to control roads, to channel the traffic of people and goods and to generally supervise the surrounding area – the only aspect that so far explains the existence of this structure in the Late Antique province of Noricum. This is clearly an aspect that also characterizes the Limes along the Rhine and Danube during its classical period.

Because of its alignment towards the north, it is likely that an important purpose of the Devil’s Ditch was to secure the rural area around *Flavia Solva*, which was extensively used as a resource for the city and the Late Antique settlement on the Frauenberg. Late Roman villas could be used as fortified central storage facilities for goods. Similar arguments have been used to interpret the systems in England²⁵. This might be the case, because Roman villas in Tillmitsch, Obergralla and Hasendorf were included in the area north of *Flavia Solva* guarded by the Devil’s Ditch. Taking this into consideration, we can define a clearly marked area of the agrarian hinterland limited to the north by the Devil’s Ditch, which was controlled by a strategically important position on the Frauenberg near Leibnitz (Fig. 8).

It may well be possible that the Devil’s Ditch was used to control refugees from Pannonia relocating in the area around *Flavia Solva*. Scholars believe that an exodus from Pannonia to other Roman provinces took place between AD 401 and 408. Maybe some of those immigrants did not go to Italy but to Noricum instead – and around the *Flavia Solva* area. If they left Pannonia at the start of the 5th century AD, Noricum was the nearest destination in the Roman Empire where a relatively safe environment still existed. And maybe the magistrates of *Flavia Solva* were

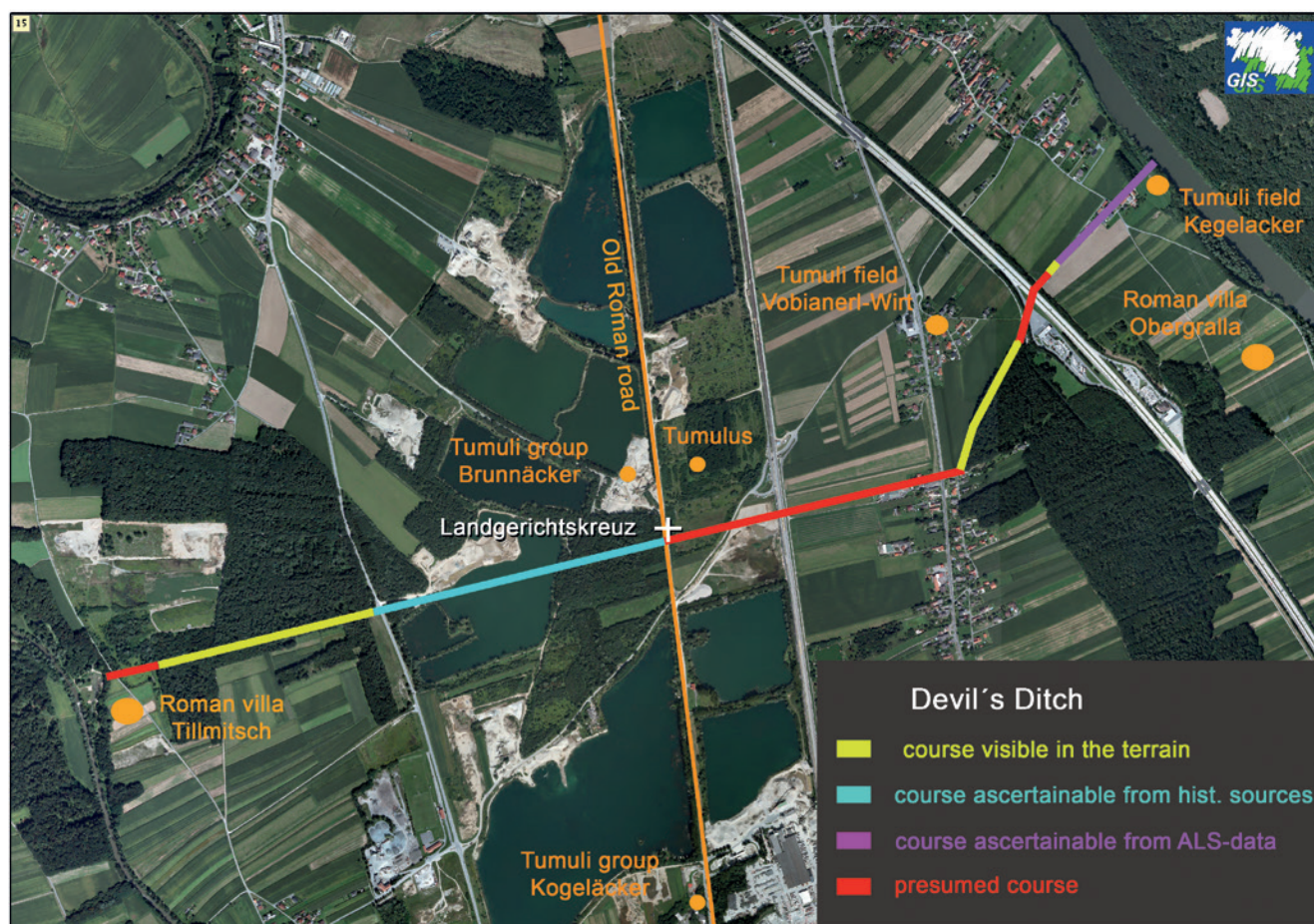


Fig. 8: The Devil's Ditch in the "Leibnitzer Feld" with relevant archaeological sites partially mentioned in the article (Source: GIS Steiermark, Illustration by Kulturpark Hengist).

aware of this and tried to control the situation and possibly prevent violent incidents by building the Devil's Ditch. The earthworks only made sense if a group existed on the other side who claimed the defended enclosed area as their own. Clearly, it is speculation, but what if a group of a few hundred settlers from Pannonia tried to settle down and a conflict arose, especially if it then became clear that the closer vicinity of *Flavia Solva* was not the only territory that was of interest to them?²⁶

As recently stated by Andrew Poulter, who has written extensively about the purpose and use of the *Claustra Alpium Iuliarum*, we also can conclude: "An indefensible frontier: the purpose is regulation, not defence."²⁷

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- 1 Gutjahr 2013.
- 2 OG Lebring-St. Margarethen, KG Lebring, Gst. Nr. 632/8 und 870/1, and OG Gralla, KG Gralla, Gst. Nr. 713/2 und 714.
- 3 Gutjahr 2013, 209–221.
- 4 Gutjahr 2013, 197–209.
- 5 Gutjahr 2013, 236–238.
- 6 Gutjahr 2013, 236–238.
- 7 Gutjahr 2013, 197–198.
- 8 Gutjahr 2013, 244–250.
- 9 Gutjahr 2013, 250: 2 sigma = AD 250 to 610; 1 sigma = AD 330 to 550.
- 10 Ladstätter 2003, 318.
- 11 Ciglencéki 2007, 317–318; Gutjahr 2013, 252 n. 277.
- 12 For predominantly Germanic foreign components in the cemetery see generally Steinklauber 2002a, 185–188; Steinklauber 2002b, 489–495. Weapons/military attire: Steinklauber 2002a, 179–180, pls. 62–64 (Grave F 229, lance- and arrowheads). Steinklauber 2002b, 491–493 (Germanic soldier in Roman service). See also Steinklauber 2006, 174 (F 412, robbed prominent grave of a Germanic military person?).
- 13 Karl 2013, 291–300.
- 14 Treptow 1907, 80.
- 15 Hiden 2013, 227–228.
- 16 Ciglencéki 2007, 317–328. Particularly well documented for the western region of Slovenia; see, for example, the road network in the Julian Alps (Ciglencéki 2011, 259–271 with fig. 5, 1).
- 17 Schallmayer 2006, 78–81.
- 18 Štulić 2015, 1–7.
- 19 Soproni 1985, 10–12 and Visy 1988, 25 dated them to after the victory of the *Sarmates* in AD 322 and to Constantine I with use until AD 378 (Bat-

tle of Adrianopol). Recently, briefly summarized by Heinrich-Tamáška 2014, 176–181, esp. 177, fig. 6 (*limes Sarmatiae*: building connected to the surrender of the province Dacia at the end of the 3rd century AD) with the systems in the Middle and Lower Danube region.

20 Fiedler 1986, 457–458, 460–463.

21 Probably built by King Offa during the second half of the 8th century AD between Wales and Mercia along the Welsh-English Border: <http://en.wikipedia.org/wiki/Offa%27s_Dyke> (accessed 08.03.2017).

22 <http://de.wikipedia.org/wiki/Nico_Ditch> (accessed 08.03.2017);

23 <<http://www.devilsdykem.org.uk/devilsdyke>> (accessed 08.03.2017).

24 Gutjahr 2013, 258.

25 Gutjahr 2013, 258.

26 Gutjahr 2013, 271 mit n. 437.

27 Poulter 2012, 122; Ciglenečki 2015, 385–430 also with regard to the *Claustra Alpium Iuliarum*.

Steinklauber 2002b · U. Steinklauber, Die frühvölkerwanderungszeitliche „barbarische“ Komponente im Gräberfeld Frauenberg bei Leibnitz. Fundberichte aus Österreich 41, 2002, 489–495.

Steinklauber 2006 · U. Steinklauber, Die Römer gehen. In: G. Koiner/M. Lehner/T. Lorenz/G. Schwarz (eds.), Akten des 10. Österreichischen Archäologentages in Graz 7.–9. November 2003, Veröffentlichungen des Instituts für Archäologie der Karl-Franzens-Universität Graz 6 (Vienna 2006) 173–179.

Štulić 2015 · S. Štulić, Research of the Roman trenches in Serbia in relation to the Csörsz ditch in Hungary. In: Hungarian Archaeology, E-Journal 2015 Autumn, 1–7.

<http://files.archaeolingua.hu/20150/eng_Stulic_150.pdf> (accessed 08.03.2017)

Treptow 1907 · E. Treptow, Grundzüge der Bergbaukunde einschließlich Aufbereitung und Brikettieren⁴ (Vienna 1907).

Visy 1988 · Z. Visy, Der pannonische Limes in Ungarn (Budapest 1988).

Zahn 1875 · J. von Zahn, Urkundenbuch des Herzogthums Steiermark 1. 798–1192 (Graz 1875).

BIBLIOGRAPHY

Ciglenečki 2007 · S. Ciglenečki, Zum Problem spätrömischer militärischer Befestigungen im südlichen Teil von Noricum mediterraneum. Schild von Steier 20, 2007, 317–328.

Ciglenečki 2011 · S. Ciglenečki, Vloga in pomen naselbine Tonovcov grad / The role and importance of the settlement Tonovcev grad. In: S. Ciglenečki/Z. Modričan/T. Milavec, Poznoantična utrjena naselbina Tonovcov grad pri Kobari-du. Naselbinski ostanki in interpretacija / Late antique fortified settlement Tonovcov grad near Kobarid. Settlement remains and interpretation. Opera Instituti Archaeologici Sloveniae 23 (Ljubljana 2011) 257–287.

Ciglenečki 2015 · S. Ciglenečki, Poznorimska vojska, Claustra Alpium Iuliarum in utrjena krajina v jugovzhodnih Alpah / Late Roman army, Claustra Alpium Iuliarum and the fortifications in the south-eastern Alps. In: J. Istenič/B. Laharnar/J. Horvat (eds.), Sledovi rimske vojske na Slovenskem / Evidence of the Roman army in Slovenia. Katalogi in Monografije 41 (Ljubljana 2015) 385–430.

Fiedler 1986 · U. Fiedler, Zur Datierung der Langwälle an der mittleren und unteren Donau. Archäologisches Korrespondenzblatt 16, 1986, 457–465.

Gutjahr 2013 · C. Gutjahr, Der „Teufelsgraben“ im Leibnitzer Feld. Archäologisch-historische Forschungen zu einem außergewöhnlichen Bodendenkmal im Bezirk Leibnitz, Steiermark. Römisches Österreich 36, 2013, 193–294.

Heinrich-Tamáška 2014 · O. Heinrich-Tamáška, Das Alföld im ersten nachchristlichen Jahrtausend: Landschaft und Besiedlung. Siedlungsforschung 31, 2014, 161–190.

Hiden 2013 · H. Hiden, Geotechnische Untersuchung am Erdbauwerk „Teufelsgraben“. In: Gutjahr 2013, 221–228.

Karl 2013 · S. Karl, Turris antiqua in castro Leybentz. Zur frühesten Baugeschichte der Burgenanlage Leibnitz/Seggau im Kontext der spätantiken Ostflanke der Provinz Noricum mediterraneum (Unpublished doctoral thesis, Graz 2013).

Ladstätter 2003 · S. Ladstätter, Die Spätantike. In: V. Gassner/S. Jilek/S. Ladstätter, Am Rande des Reiches. Die Römer in Österreich: In: H. Wolfram (eds.), Österreichische Geschichte 15 v. Chr.–378 n. Chr. (Vienna 2003) 285–386.

Poulter 2012 · A. Poulter, An indefensible frontier. The claustra Alpium Iuliarum. Jahreshefte des Österreichischen Archäologischen Institutes in Wien 81, 2012, 97–126.

Schallmayer 2006 · E. Schallmayer, Der Limes. Geschichte einer Grenze (Munich 2006).

Soproni 1985 · S. Soproni, Die letzten Jahrzehnte des pannonischen Limes. Münchner Beiträge zur Vor- und Frühgeschichte 38 (Munich 1985).

Steinklauber 2002a · U. Steinklauber, Das spätantike Gräberfeld auf dem Frauenberg bei Leibnitz, Steiermark. Fundberichte aus Österreich. Materialhefte, Reihe A 10 (Horn 2002).