

External Examiner's Report on the PhD Thesis of Mgr. Michal Dyčka,

*The Antonine Limes:
The Comparison of the Antonine Wall and the
Odenwald-Neckar Section of the Upper-German Limes*

submitted to the Faculty of Classical Archaeology at the Charles University, Prague, in 2020.

Dr. Christoph Rummel

Römisch-Germanische Kommission des Deutschen Archäologischen Instituts

Palmengartenstr. 10-12

60325 Frankfurt am Main

Germany

christoph.rummel@dainst.de

Brief summary of the dissertation

Mgr. Dyčka's submitted work sets out to compare two Roman Frontiers of the 2nd century AD, the Antonine Wall in modern Scotland and the so-called Odenwald-Neckar Limes in Germany in order to shed light on the function of Roman frontiers at this time. He provides overviews of the histories of research along these frontier stretches and detailed discussions of the material remains of military installations along the two sectors studied, contrasting these to some extent. Key of his work, however, are GIS-based analyses of these installations and their interrelationships. In this, he provides interesting new insights on the way these frontiers were laid out, developed and some interpretations as to how they may have operated.

Brief overall evaluation of the dissertation

The submitted work provides detailed and comprehensive overviews of the Frontier Sectors studied and important new observations on the basis of GIS aided analyses that shed new light on their general development, and their early periods in particular.

The main body of the thesis consists of descriptive sections, outlining in admirable detail all component parts of the Antonine Frontier in Scotland as well as its research history (Chapter 2) and providing a slightly less detailed similar overview of the stretch of Roman frontier between the river Main near Obernburg/Wörth in modern Bavaria and Schlossau in modern Baden-Württemberg (Chapter 3). This is a valuable addition to Roman Frontier Studies, where detailed comparisons of frontiers are rare.

The primarily descriptive first sections of these two chapters are followed by GIS based analyses of component parts such as forts, fortlets and towers, which are evaluated individually and as overviews for the respective frontier sections. It is in these sections that entirely new data is generated and presented, and the most important new insights regarding the two frontier sectors are gained.

Chapter 4, which compares the two frontier sectors under discussion, develops some of these observations into highly interesting and important themes for the wider field of Roman Frontier Studies. Of particular relevance here are the parts of the thesis dealing with the development of the frontiers: the identification of alignments in elements of the Antonine Wall that is developed into a convincing argument for the surveying process, and the observation that the course of the frontier in the Odenwald follows a least-cost-path and thereby, presumably, a natural route through this region. While this section harbours the core of new arguments that are the real strength of this work, it unfortunately carries an underlying negative tone, highlighting what cannot be compared rather than developing arguments out of these differences – although some of them could have been turned into very interesting and important further discussions (see below).

The discussion of the function of the two frontier sections in Chapter 5 is carried by an underlying assumption that Roman frontiers were built to deter or deal with an external enemy and were, fundamentally, defensive in nature. Within this framework, it develops new models for frontier function and discusses existing models for each of the two frontier sectors. This section contains important new observations for both frontiers and provides new scholarly input into the current discussion of the function of Roman frontiers. However, it would have benefitted significantly from a wider engagement with the current discussion of the function and purpose of Roman frontiers (see e.g. recent Congresses of Roman Frontier Studies) or even current themes as discussed in Border Studies in general, in order to remove or at least qualify the underlying assumption that Roman Frontiers were, by default, defensive – even if only against small raiding parties rather than large invading armies (see below).

A small inroad into this discussion is made in the concluding Chapter 6 (p. 270), but does not readdress the inherent bias of the discussion of frontier function of the previous section. This closing chapter generally sums up observations and developed themes of the thesis in 6 concise pages, summarizing what is not only a substantial description and assessment of archaeological data related to the Roman frontiers in the sectors studied, but an important and welcome addition of new and tangible data to the discussion of frontier development and function.

For all the criticisms of individual aspects above and in the detailed evaluation below, Mgr. Dyčka deserves major credit not only for putting together this work in sound academic English (bar isolated glitches in syntax and occasionally grammar), but particularly so for braving the important step of comparing different geographic Roman Frontier sectors with all the problems this entails (different languages of literature concerned, different research traditions etc.) – and thereby bridging two major European research traditions, neither of which is originally his own.

Detailed evaluation of the dissertation and its individual aspects

Formal Aspects:

In the reviewer's opinion, the submitted work fulfils all criteria required for a doctoral thesis in formal terms. The **language, structure and grammar** are sound with minor mistakes that do not distract or deter from following the flow and argument of the work. This deserves particular credit, as the author is not writing in his native language.

There are ample **illustrations**, particularly those of the GIS-based analyses carried out as part of the work. These are not always easy to navigate whilst reading the work – particularly in the summarising sections of chapters 2 and 3, where the reader is forced to jump through illustrations (and Figs 22 and 23 have been mixed up, please rectify!). However, there seems to be no way of making this process more straightforward without doubling illustrations. It would no doubt make it easier to follow some of the arguments – particularly for readers not familiar with these particular stretches of Roman frontiers – if schematic diagrams such as those provided in Figs. 2 and 9 could be provided for the analyses of all major, if not all sites. This might be a good addition for a published version of this study.

The plans of forts, presented as “plates”, are evidently drawn by the author on the basis of existing plans, and this is amply referenced. One exception is Plate 4 of Rough Castle, which was presumably not drawn from scratch by the author, and should be furnished with a reference before any publication. In formal terms, there are variations in referencing in terms of whether capital letters are used or not – this should be harmonised (e.g. plate 17, Robertson 1957) – but the plans are clear and easily understood. It is unclear, however, where the author draws the distinguishing line between “expected” archaeological features and “presumed” ones. This should be clarified and pointed out, particularly so as some features (e.g. Plate 29) are then presented in dashed lines – implying that they are not entirely proven, but without explanation. In the discussions of individual sites, the distinction between identified structures and “presumed/expected” ones could be given more prominence.

The **bibliography and referencing** throughout the work is admirable and consistent, and suits the argument. Whether historical sources such as the *Historia Ecclesiastica* should be carried in the general bibliography or a separate list is a matter for argument, as is the question whether they should be filed – as opted for here – under the original author (in this case “Bede”) or under the author of the translation (in this case “Jane, L.C.”). The reviewer personally does not favour the mode chosen by the author, but it is consistent and the citation adequate. In formal terms, therefore, the thesis meets all required criteria in the eye of this reviewer, but should undergo a final check for minor omissions and inconsistencies.

Use of Sources and Material:

The thesis draws on a wide range of source material for the parts based on existing literature (Chapters 1, 2.1 & 2.2., 3.1 & 3.2), as well as the major sources for wider arguments in the comparative and analytical sections (Chapters 4-6). While the literature drawn on and cited for the Scottish border is up to date and comprehensive (including the recent Poulter 2018 and the 2018 geophysics report on Cawder, although in the history of research, no mention is made of Gildas and his references to the Antonine Wall), the sources drawn on for the German frontier stretch are less so. In particular, it must be noted that the bibliography does not include any of the works of the late Stephan Bender, former Limes-Coordinator for the German state of Baden-Württemberg. This is unfortunate in view of the two brief papers Bender produced on the connection between the Odenwalddlimes and the Neckarlimes (2012) and on the nature

and development of the Odenwaldlimes (2011)¹ that have direct bearing on the definition and extent of the so-called Neckar-Odenwald limes.

In general, there is a bias of the thesis of the whole towards the Scottish data, which is primarily caused by the choice of regions studied (see comments below). In terms of current literature on GIS based viewshed-analyses, identification of long-distance alignments and slope-modelling, the reviewer is not an expert, but it seems unlikely that no key methodological papers have been published in such a dynamically developing field since Déderix 2016.

The datasets used for the GIS analyses that form the core of the work are explained in brief methodological sections at the end of each of the major chapters 3 and 4. Again, the Scottish data is convincing and an excellent base for the methods employed and observations made. On the German stretch, the lack of base data east of the stretch of frontier examined means that the viewsheds into non-Roman territory cannot be understood in full. Mgr. Dyčka explains the reasons for this, and they are understandable. Still, this is regrettable, as the German viewsheds do seem to mirror his Scottish observation – namely that it was possible to observe territory far beyond the actual frontier line. Fig. 247, the cumulative viewshed, implies much the same in Germany, but in the southern half of the sector examined, there is no data for this – limiting his basis for comparison in the concluding chapters. This is unfortunate and one cannot help but wonder why this sector was chosen for comparison, if ultimately the datasets necessary for analyses were not obtainable for the author.

These criticisms should ideally be addressed in publication or future papers arising from this thesis, but they do not weigh so heavily as to fundamentally undermine the value and addition of the submitted work to current research on Roman Frontiers.

Structure and Argument:

The thesis is rigidly and clearly structured: introductory and methodological chapters are followed by discussions first of the Antonine wall and then the Odenwald-Limes, each with descriptive sections on the research history and actual remains of each frontier sector followed by the GIS analyses and interpretative sections. The concluding chapters contain a comparison of the frontiers, discussion of their *modus operandi* and a final conclusion.

This rigid structure makes for a clear argument and the reader is carried along easily, provided with a detailed understanding of each frontier sector and the appertaining data (although, as noted above, the Scottish data somewhat overshadows the information from Germany both in extent and detail – a direct result of the choice of study area (63km of frontier in Scotland are being compared to c. 35km in Germany, reflected in the Antonine Wall chapter taking up 148 pages of the work, while only 89 pages discuss the Odenwald frontier).

In terms of comparing the frontiers, however, the structure is not so conducive. The sheer length of the presentations of data on each frontier makes it difficult to draw on the parts that should be compared in the three concluding chapters. This seems to have posed a problem also for the author himself, as much of the comparative approach gets stuck in stating that the situations are so different that they cannot be compared – even though clear differences could surely be contrasted and lead to a very interesting and fruitful discussion of why they exist!

¹ St. Bender: Einem neuen Limes auf der Spur : Forschungen an der Nahtstelle von Odenwald- und Neckarlimes in Bad Friedrichshall. *Archäologische Ausgrabungen in Baden-Württemberg* 2011 (2012), 44-48 & S. Bender, Unser Bild vom Neckarlimes: bald nur noch Geschichte? *Archäologie in Deutschland* 2011, 3 (2011), 38-39.

In general, the thesis attempts two things: to present the two frontier sectors studied and their research history in detail, and to undertake new GIS based landscape-archaeological analyses on each sector. Ultimately, however, these are two separate approaches. A comparison of the archaeological remains of the two frontiers alone would have been fruitful and a welcome addition to the subject on its own. Equally, a landscape archaeological analysis and comparison of the two stretches is an important addition in its own right. Mag. Dyčka's approach combines both – but this results in a mass of data that is often difficult to navigate. One cannot help but wonder whether a restructuring of the work, separating it by these approaches, rather than on the basis of the geography of the regions studied, would have led to a clearer argument.

Thus the archaeological data for the component parts of each frontier could have been presented by type: the actual fortified frontier line, forts, with their key elements (as done for the Antonine Wall), fortlets (Kleinkastelle), enclosures, towers etc. Equally, the viewshed analyses could have been contrasted directly, as could the distance alignments, and the slope models. Each of these categories could have been compared and contrasted directly.

Had this approach been adopted (and, if possible, this is highly recommended for publication), the following differences/comparisons would have become much clearer and could have been discussed in more detail following a clear comparison and contrast approach for each category:

Archaeological remains (for example):

- The actual defences are very different. Why!?
 - o *here much more could be made of local conditions and the availability of building materials*
- Forts in Scotland are situated on the wall, in Germany most are set back from the frontier line.
 - o *This seems to imply a different structure and function of the frontier. Or is it because of manning towers?*
- Forts on the Antonine Wall have enclosures, no such thing exists on the Odenwald.
 - o *Could this be seen as an indicator of how safe the Romans considered "their" territory?*
- Forts on the Antonine Wall have granaries, those in the Odenwald appear not to.
 - o *What does this say about supply to troops on the frontier and therefore the frontier zone in general?*
- Most forts in Scotland have *praetorian*, those in Germany generally don't.
 - o *Surely this has a significance beyond the mere fact that should be discussed?*
- In Germany, baths are outside of forts. In Scotland, they are often found in forts or in enclosures.
 - o *Could this be related to security issues? Availability/perceived value of resources?*
- Civilian settlements and practical absence thereof on the Antonine Wall
 - o *This deserves significantly more discussion than that on p. 67 of the thesis (which includes a mistake, please change the second "Antonine Wall" to "Odenwald-Limes").*
- Fortlets on the Antonine Wall are placed on the wall and guard access points in the way of milecastles. Those in Germany don't.
 - o *This is actually a very important point regarding possible frontier function, of which much more should be made in the thesis.*
- There are practically no towers in Scotland, yet these are a key feature of the German frontier.
 - o *This is, of course, noted in the thesis but not discussed in nearly enough detail. It probably has a direct bearing on the function of the frontier (who manned the towers). Also, the towers are now generally believed to have also guarded crossing points of the frontier. Designated crossing points are an important element of frontier function, which should see significantly more discussion than the brief note on p. 23.*

GIS Analyses (for example):

- Viewsheds: both frontiers appear to have had the capacity to keep watch over a significant stretch of terrain beyond the demarcated frontier line, crucially, including all natural access routes

towards the frontier (although this is not as clear on the German side due to limitation of data, see above).

- *This, in the reviewer's opinion, is one of the key and most important points of the thesis!*
- Distance-Alignments/ Least cost path analysis: There is clear evidence for the planning mechanisms to be identified on the Antonine Wall. The Odenwald stretch, in contrast, follows the least cost path uncannily closely.
 - *This, again, is a crucial point that should be highlighted much stronger, and elaborated on much more. It seems to suggest that the Antonine Wall was planned ex novo in undeveloped territory, as a line connecting the Firth of Forth and Firth of Clyde, while the Odenwald Limes presumably followed the course of an existing natural route that was cleared and eventually fortified (much in the way that Tacitus describes that early limites were little more than cleared roads through forests!!). Somewhere in the thesis should appear a discussion of the "wings" on the stone fortifications of the Balmuildy fort in Scotland, which imply that it was built before the frontier defences were set – and that these may have been intended to be a stone wall initially.*

This recommendation may sound overly critical. It is not intended to fundamentally question the adopted approach. The data presented in its current format creates the foundation for such questions and exiting themes to be asked and developed. Many of them are, but these discussions are difficult to locate in the overall work. Were they to be more easily identifiable in a revised structure (and, often, developed further), this would make the work so much more exciting and important than it already is in its current state (with relatively little effort). To put it more positively: all these are important points that the thesis lays a fundamental basis for, and they should at the very least be developed further in future papers by Mgr. Dyčka.

Method:

As stated above, the GIS analyses employed in the submitted work provide important new insights into both of the frontier sectors studied and provide an important addition to current Roman Frontier Studies. This cannot be highlighted enough. As far as the reviewer can judge, the methodology of the viewshed analyses, distance alignments, least-cost path analyses and slope models is sound. The results are impressive. Comparison between two frontier sectors is an important tool for understanding Roman Frontiers that is all too rarely employed in this subdiscipline of Roman Archaeology that has long been steeped in national research traditions – albeit being engaged in close international dialogue. As such, the thesis is an important addition to Roman Frontier Studies and our understanding of Roman frontier development and function.

This makes it all the more regrettable that the employed methods, which clearly work and lead to excellent results are not contextualised within an adequate **discussion of methodology, current trends and research themes** – both in terms of a reference framework *state of the art* when it comes to the GIS analyses employed and in terms of current thematic debates in Border Studies and Roman Frontier Studies. The subchapter on “Methodology of the Thesis” covers a grand total of three paragraphs on pp. 3&4, the methodological introductions to the GIS Analyses for Scotland are dealt with on 6 pages and one paragraph (pp. 92-98) – of which only just over three pages deal with the types of analyses employed and their research framework. For Germany, the Methodological discussion extends over slightly more than 4 pages (pp. 199-203) – consisting mainly of an outline of research questions, followed by a description of why some approaches differ from those employed on the Antonine Wall. In total, therefore, the entire thesis includes a methodological section that extends to a maximum of 11 pages that seek to phrase research questions, denote a study area, develop, outline and contextualise a methodology and provide an

overview of the main themes and arguments in current research. This is in no way achieved – something that becomes particularly apparent in two areas:

- for the analyses, the work of D. Woolliscroft on signalling on Roman Frontiers is touched on (pp. 94 & 200), but never discussed in detail, even though it is of essential relevance and a key precursor for the approach adopted in this work. This serves as an example, the same is true of other key works employing spatial analyses on Roman frontiers (e.g. Schröder 2018, Pazout 2018 etc.) with the exception of the work by Poulter on the Antonine Wall – although this, too, could have been engaged with in more detail.
- there is no in-depth contextualisation of the extensive discussion on the function of Roman Frontiers. This is particularly evident in the chapter that proposes a *modus operandi* for the two sectors studied, which does not engage with current debates but, as stated above, carries the underlying assumption that frontier were primarily defensive in purpose and nature (which may well be true, but there is significant scholarly debate about this, which is not touched on or engaged with, see also question 6 for the author, below). In this, it skirts the issue of crossing points of the frontier practically entirely. Engaging with Luttwak's theories from the 1970s (even in their 2016 reincarnation that is cited in the bibliography) is not sufficient engagement with the state of research and discussion in 2020!

In terms of method, there are two key points that are of central importance for this study, and that are not explained adequately:

The first is the **issue of offsets used in the GIS based analyses** – a point fundamental for nearly all of the generated new data. These offset values are not really discussed or contextualised against similar studies that use different values – although those of Woolliscroft, Poulter and Foglia are referred to briefly on pp. 94, 96 & 200, but not engaged with critically.

While Mgr. Dyčka outlines his arguments for using a 5m offset on the Antonine Wall (the presumed height of the rampart plus the height of a man, p. 96), this value would have gained significantly more scientific basis had it been reached through a full discussion of arguments for and against rampart height, rather than solely based on the assumption made by the author. It should furthermore have been contextualised in the current debate regarding the heights of towers and gate-houses on the basis of archaeological data (e.g. papers by Bidwell and Mackensen (and others) in Flügel & Obmann, 2013, *Römische Wehrbauten...*), particularly so as the alignments identified in the analyses are often based on the positions of gate towers or corner towers of the forts. This would have made the issue of offset height for the site of Cadder far less of an issue and removed the necessity for separate discussion on p. 120.

Similarly, the offset value used for the Odenwald Limes is given as 9m on p. 202. The argument presented for this decision extends to a mere paragraph! As the results of the analyses are so interesting and important, it is extremely regrettable that the choice for the offset value that lies at their heart is given solely as an assumed tower height in “compromise between the traditionally stated 10m on ORL and the suggested minimal height of 7,60m by RLK”, citing sources from 1935 and 1984. In order to be scientifically sound, the choice of offset should have been embedded in an engaged discussion of the extensive debate regarding watchtower height, existing reconstructions, the considerations of Woolliscroft in his analyses of the signalling systems in Germany (several articles by Woolliscroft on the frontier in Germany are not referred to in the thesis), similar studies etc. etc.

The second key problem in terms of method is the **actual choice of study areas that are being compared**, explained in a mere page and a half at the outset of the thesis. The key reason for comparing these two particular sets of frontiers is stated (p. 1) to have been the inspiration through a paper by A. Thiel, delivered and prepared for a highly specific setting that made the choice of these sectors relevant.

This argument seems a tenuous basis for the development of a major and detailed frontier comparison (and there are numerous good reasons why the Antonine Wall *should* be compared to the Odenwald-Limes, but these are not given!). The problem is then exacerbated by two choices: Mgr. Dyčka extends the geographically defined frontier sector in Scotland to include the coastal sites to East and West of the Antonine Wall – in order to discuss a frontier system in its entirety (yet he does not discuss the northern forts of Bertha, Strageath and Ardoch, which surely also formed part of the “system” as a whole, p. 26). At the same time, he reduces the German sector studied from the geographically defined Odenwald-Limes between the rivers Main and Neckar on the basis of understandable (access to adequate data-sets for his analyses), but not necessarily scientifically valid reasons (areas defined on the basis of geographical factors or historical development would provide a more adequate basis for comparison in order to reach valid conclusions for analysis of historical factors).

The further reduction of the German sector to include only the northern 35km of the Odenwald-Limes “since the line of the frontier south of Schlossau was evidently adapted to the flatland near the Neckar river, and was not as comparable with the Antonine Wall as with other sections of the ORL” (p. 1), not only lacks any form of scientific basis, but makes the choice of study sector in Germany practically arbitrary. The alleged “flatlands” between Schlossau, where the study area of this thesis finds its southern terminus, and Bad Wimpfen, where the Odenwald-Limes *actually* terminates at the river Neckar (at an elevation of 150m), are significantly less mountainous than the terrain further north, but include elevations of 462m near Mudau, 442m near Einbach, 330m near Muckental, 331m near Dallau/Neckarburken and 312m near Hohbaum. The highest elevation along the course of the Antonine Wall is Castle Hill near Kilsyth, at a height of 170m, while its lowest are the two Firths at approx. sea level. In view of absolute elevation differences between 160 and 310m in the southern stretch of the Odenwald-Limes and 170m in Scotland, the two terrains would appear absolutely comparable – although it is, of course, true that the Odenwald-Limes runs in a straight line across this southern section (but this would, if anything, have made the discussion all the more interesting and relevant!). The particular choice of study area in Germany means that the region discussed it is nothing like the “Odenwald-Neckar Limes” outlined in the title.

This means that the thesis compares an entire frontier system of the 2nd century, created and developed in the Antonine period and abandoned in the 160s AD, in Scotland with a relatively arbitrary sector of the Roman Frontier in *Germania Superior*, selected on the basis of availability of modern datasets, that is only c. half as long, has an entirely different make-up of constituent parts and an entirely different developmental history (established somewhere between the late first century AD and AD115). The only common denominator between the two sectors is, as Dyčka rightly states, their abandonment in the 160s AD (although in Scotland as part of a retreat, in Germany as part of an advance).

Had the entire Odenwald-Limes been studied southwards to Bad Wimpfen, this would have meant a comparison of two frontier sectors of similar length (63km in Scotland, c. 70km in Germany); both sectors would have been entire frontier systems as defined by geography and their historic development. It would furthermore have extended the German archaeological dataset by 3 forts (Oberscheidental, Neckarburken, Wartberg; 4 with the inclusion of Bad Wimpfen) and 5 fortlets (Robern, Trienz, Gundelsheim, Duttonberg, Kochendorf) – thus readdressing the imbalance in favour of the Scottish data that the study suffers from in its present form. It would also have meant that the methodological difference in approach between the presentation and discussion of archaeological data on the Antonine Wall and the Odenwald Limes, as explained on p.162 of the thesis, could have been avoided.

In terms of method, the choice of study areas suffers even further from the ready availability of base datasets for the analyses in Scotland, which differs starkly from the lack of key tiles in the territory east of the Odenwaldlimes, as outlined in the discussion of *Sources and Material* above.

Despite these misgivings, the observations made, as stated at the outset, are remarkable and highly interesting. It would simply be desirable that they be placed on a more scientifically sound footing and that the ample scope for comparison (see above) had been built on a basis of more comparable datasets.

A final point of criticism in terms of method is the failure of the thesis to engage more deeply in a discussion of the influences of natural conditions and availability of resources on frontier creation and development, beyond the brief note on p. 194 regarding stone towers in the Odenwald (although this is a good approach, it should merely be extended). The work would have benefitted from a more detailed discussion of whether it was feasible to excavate ditches in specific ground conditions (e.g. in areas of predominant hard rock, where they would have had to be quarried – for which there is some evidence on Roman frontiers), an argument particularly relevant for the sectors of the Antonine Wall where there is no ditch, as it is for the discussion of pp. 178/179. Equally, there should be some discussion to what extent the availability of timber or stone may have led to these materials being employed for the construction of frontier components (e.g. pp. 22/23, 32/33). The use of timber for the creation of timber towers and the palisade is touched in the discussion of the width of the “corridor” of cleared trees in the Odenwald – but this discussion certainly also deserves more depth. Particularly so if, as the author mentions on p. 253, the possibility of controlled burning of trees is included.

Despite these criticisms, it is important to reiterate that the thesis provides interesting and highly relevant new insights into the two frontier sectors studied and thereby provides an important new contribution to the subject of Roman frontier studies.

Personal contribution to the subject:

The most obvious way the work contributes to the discipline of Roman Frontier Studies is in the **provision of comprehensive and largely up to date datasets** on two different stretches of frontier, belonging to two different research traditions and with literature in two different languages for comparison, and in this **comparison** being carried out with interesting new results – even though this would benefit from a clearer structure as suggested above. Such comparisons are still rare in Roman Frontier Studies but they are, as this study shows, a key way forwards in our quest to better understand the edge of the Roman Empire.

A major advancement, in the eye of the reviewer, is the detailed argument for the **early planning, surveying and establishment of the Antonine Wall as shown on the basis of distance alignments**. This builds on previous and existing studies, including Poulter 2018, and significantly advances scholarly debate regarding the Antonine Wall. In importance, these observations equal the **insight that the Odenwald-Limes follows a least-cost path** – which not only provides a sound basis to support the historical sources regarding the development of the frontier in Germany along roadways and routes, but also offers a new basis for comparison and contrast between different approaches to frontier design and function within the Roman Empire.

A further key contribution the work makes to our understanding of Roman Frontiers is that it shows, on the basis of reliable datasets, that **Roman interest extended significantly beyond the demarcated frontier line**, as shown by the range of visibility into non-Roman territory as proven for the Scottish frontier and shown to be highly likely for the Odenwald sector studied – where it sadly is limited by the availability of datasets as discussed above.

With these points, and despite all the criticisms voiced above, the work submitted by Mgr. Dyčka's constitutes an important contribution to Roman Archaeology in general, and Roman Frontier Studies in particular.

Questions for the Author

1. In your plates, what is the difference between “expected” and “presumed” archaeological features?
2. Please explain in more detail your reasons and arguments for choosing to compare the Antonine Wall and the Odenwald frontiers. Especially, why did you choose not to study the entire Odenwald-Limes stretch in Germany? Particularly as it seems to me (see above) that this particular choice actually causes a number of the problems you then have in comparing the two frontiers.
3. The results of your GIS analyses are very important. But provide **more** detail on how you reached the heights for your offsets (why they differ from other studies, and why they differ between Germany and Scotland). The viewsheds on both frontiers, as the alignments in Scotland, present compelling pictures. How, though, do you think Roman surveyors could have set up these systems intentionally seeing that your models rely on offsets of 5m/7m in Scotland and 9m in Germany – when during the early stages of frontier development there would have been no elevated structures in existence?
4. What are your plans for further development of some themes that you do not compare in detail, such as (for example):
 - Different construction / surveying on the two frontiers (see above) – and here in particular the potential that they result out of the historical development of the frontiers (Antonine Wall created *ex novo* and modelled, to some extent, on the experience of Hadrian’s Wall vs. Odenwald as a historical development, following Tacitus, out of a roadway through a forest, cleared of trees, that gradually develops into a frontier line (see especially arguments and theses by Mommsen on this!).
 - The fact that on the Antonine Wall, baths are in forts or in enclosures, whereas on the Odenwald stretch they are always outside of the forts. What reasons could there be for this, what can this say about the territory in which the forts are placed (peaceful / hostile) and potential interaction with local populations, could it be influenced by the availability and use of material for operation of the baths (availability and relative value of wood/other fuel as a commodity).
 - The fact that on the Antonine Wall nearly every fort has a granary, whereas on the Odenwald stretch these are practically absent. What does this say about supply-lines and – again – about the different environs the Romans found themselves in and how they perceived it?
5. To what extent do your observations contribute to the wider academic debate on planning of Roman frontiers (you do engage with this, but could you go into more detail)? In particular, do your observations indicate the existence or lack of any centralised planning (extend on your point on p. 245)? If they provide evidence for it, at what level (local decisions, provincial administration, empire-wide choices).
6. Please explore in further detail what your observations contribute to the discussion on the function and purpose of Roman frontiers, bearing in mind current arguments – e.g. as presented at the 2018 Congress of Roman Frontier Studies in Serbia, that the purpose of frontiers could have been, amongst others: to defend the Empire; to prevent raiding; to control transhumance; to control movement into and out of the province; to protect travellers in the frontier zone; to keep the troops busy; to create an edge to the empire for the Romans; to serve as a symbol and object of intimidation; to enable rapid movement of troops along the edge of the Empire. In this, please include reference to designed crossing points of the frontiers such as milecastles, gates and accessways.

In points 5 and 6, please include in your discussion a reference to the wider geographic setting of the frontier sectors studied – beyond the local conditions of your GIS analyses. I.e. the relevance of the Antonine Wall being *where it is* in the British Isles, and the Odenwaldlimes connecting Main and Neckar in the manner, and in the location that it does.

Conclusion

The submitted work provides a comprehensive overview of the archaeology of the two Roman Frontier sectors studied – albeit with a general underlying bias towards and in favour of the Antonine Wall – as well as generating new data that provides an important scholarly addition to the research field of Roman Frontier Studies.

In this, however, the particular choice of research area in Germany is unfortunate – and the reasons for this selection never adequately explained in the work. The particular sector chosen appears somewhat arbitrary, exacerbates the inherent bias towards the Scottish data in the work and appears to cause much of the problems the author finds in comparing the two frontier sections. This is particularly lamentable as, in the eyes of the reviewer at least, many of these problems could potentially have been avoided by simply studying the geographically and historically more logical unit of the entire frontier section between the Main and Neckar rivers, i.e. the Odenwald-Neckar Limes as implied by the title of the work, rather than only its northern part.

In view of this, it is all the more impressive that despite this methodological issue and the criticisms voiced in the detailed evaluation, the thesis identifies key new topics in terms of the planning and function of the Antonine Wall and the genesis of the Roman Frontier of the Odenwald. These observations are highly relevant for wider current scholarship.

I therefore recommend the submitted dissertation with the tentative grade of pass, but also recommend that some of the themes and issues touched upon in this report be developed further either for publication or in future papers by Mgr. Dyčka.

Frankfurt, 18.08.2020