Michael Doneus, Christian Gugl and Nives Doneus, **Die Canabae von Carnuntum. Eine Modellstudie der Erforschung römischer Lagervorstädte. Von der Luftbildprospektion zur siedlungsarchäologischen Synthese.** Der Römische Limes in Österreich, volume 47. Publisher of the Österreichische Akademie der Wissenschaften, Vienna 2013. 291 pages with 131 figures, 27 plates, 2 appendices, and 2 foldable maps.

Roman legionary fortresses have attracted archaeological attention since the nineteenth century. These military cities with a more or less methodical and standardized layout, housed one or two of the twenty-five to thirty prime combat units of the Roman armies. The abundance and the variety of material culture in these complexes also contributed to their intensive archaeological exploration. The canabae legionis – the civilian suburbs of these castra – have, on the other hand, received far less attention and are still poorly understood. This is hard to comprehend as detailed research of these settlements could lead to fascinating socio-economic, juridical, societal and religious insights into Roman military communities. The lack of research in these canabae is partly due to their largely undefined and extensive spatial layout and to the fact that most of them were overbuilt by later settlements.

Carnuntum is Austria's largest archaeological landscape, preserving a settlement duality which is a phenomenon exclusive to Roman legionary sites of the early and middle imperial periods. The paired settlements consist in the canabae surrounding the legionary fortress, plus, within a distance of two kilometres, an additional civilian settlement. In many cases such habitations achieved city status later on. Carnuntum is one of the few sites with this Roman military-civilian complex that was only partially overbuilt or disturbed in later periods. This results in a well preserved and diverse archaeological resource spread out over an area of several square kilometres, which is easily accessible for potential sondages, excavations and all means of prospective research. It is hardly surprising that archaeological research started here already one hundred-fifty years ago and is still in process. Part of the team that worked on the impressive 2007 publication of the 1968–1977 excavations in the north-eastern praetentura of Carnuntum's castra legionis, has now produced this monograph on Carnuntum's canabae legionis. This new study is based on systematic aerial survey carried out in the Carnuntum region between 1965 and 2008, which has resulted in a total of 1464 aerial pictures, 330 of them vertical and the remainder oblique. From these panchromatic, full colour and infrared pictures – taken in a pre-drone era – a densely built-up antique agglomeration emerged including the civilian suburbs of the castra. These georeferenced pictures were related to data from older excavations in order to work out a model of the canabae legionis.

This comprehensive study can be divided in three parts. Following a methodological chapter dealing with the history and processing of the aerial pictures the second part is a detailed spatial investigation of the Carnuntum canabae, in its largest state of expansion when the settlement covered about one hundred-twenty hectares (three hundred acres). The locational criteria for the fortress' civilian suburbs are logically dictated by those of the legionary fort itself, the raison d'être for these extra-mural outskirts. Three arterial roads leading from the west, south and east gates of the fortress and a network of secondary streets divide the canabae up into core areas. This subdivision of the nine canabae-regions in an orthogonal raster system is also determined by the location of distinctive structures and buildings. Housing blocks with a variety of more complex atrium houses as well as linear strip-houses, monumental public buildings such as a so-called forum and amphitheatre (according to the authors both used for military training), sanctuaries and necropolises are some of these which determine the settlement regions. A list of more than one hundred-eighty georeferenced gravestones or fragments most of them bearing names, military or civilian functions and military units of the deceased (Anhang A), presents an intriguing archaeological data set and underlines once more the richness and possibilities of the Roman settlement complex of Carnuntum. Distribution patterns of these give a very interesting insight in parts of the diachronic development of the canabae. Two paragraphs with archaeological »mobilia« are less appropriate for this purpose and rather detract from the argument: these might have been better off in the appendices. With the present state of research it is unfortunately not possible to distinguish any further chronological phasing or dating of this settlement. The authors see their impressive study consequently as a preliminary work standing at the base of future prospective and explorational work.

The Carnuntum canabae as a model for the suburbs of Roman legionary forts is the main theme of the third part of this book. For this reconstruction of antique urban planning, the authors prepared a broad comparison between the known structures and spatial analyses of equivalent settlement complexes around the Roman Empire. The settlement duality that has

been observed at most of these parallel sites and the juridical status and organisation of the canabae legionis in these, has long been a matter of scholarly debate. Building further on Ioan Piso's work of the intra leugam-range and an evaluation of epigraphical evidence related to the administrative organization of canabae, the authors argue against a blueprint approach and in favour of independent and regional development of these Lagervorstädte. For the Carnuntum military settlement complex this study makes clear that the planning and building of the castra legionis not only went hand in hand with the canabae legionis, but also with road construction and further territorial development. It would be interesting to test these developments against those at other contemporary military-civilian settlement complexes, as well as those of later legionary forts. In the outskirts of these smaller late Roman castra we can expect civilian suburbs as well, sometimes fitted out with typical large public buildings such as »fora«-like structures (e. g. el-Lejjūn, see P. Crawford / S. Th. Parker, The East Vicus Building [Area P]. In: S. Th. Parker [ed.], The Roman Frontier in Central Jordan [Washington 2006] 247–258).

This detailed publication is very rich in excellent, often coloured, illustrations. Scrolling back and forth to find the related figures is sometimes a challenge, but the authors have anticipated in this by providing separate basic maps of the settlement complex (Beilage 1–2).

A minor point of attention is the tendency in some paragraphs to present measurements with accuracies of fractions of degrees in order to work out the antique layout planning. Dozens of studies and publications throughout the last decades have shown that such calculations are not very fruitful, since antique measurement is unlikely to have been carried out with such accuracy. The authors even contradict in later paragraphs these tendencies by stating that the irregularities of the antique terrain alone make it impossible to work with such precision.

This book is a major contribution to our knowledge of the still poorly understood layout and development of canabe legionis in general and those of Carnuntum in particular. The evidence retrieved from large scale exploration by non-destructive means in combination with the results from earlier excavations and epigraphic data make it not only a fascinating study for archaeologists and historians interested in Roman military communities and settlement development, but also as a case study for professionals working in archaeological heritage management who are dealing with preservation and protection matters of large archaeological complexes. I look forward not only to the results by this team of the newly initiated archaeological prospection project of Carnuntum using ground penetrating radar, but also to the effects of this current publication on the future research of other Roman military-civilian settlement complexes.

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