

*Fundatori pacis aeternae?*<sup>1</sup> –  
Fortifications between the High Rhine and the Black Sea from  
the time of Diocletian and the early Tetrarchy

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## Introduction

When the Roman Emperor Publius Licinius Valerianus was captured by the Persian King Shapur I during the battle of *Edessa* (Urfa, Turkey) in the early summer of AD 260, this first imprisonment of a Roman ruler had not only personal consequences for Valerian himself but was also a humiliation for the imperial government and especially the military command. This threatening imperial crisis had dramatic consequences for the provinces on the border of the Empire, not only on the Euphrates but in the northwest as well. These consequences are impressively testified to in an exemplary way by the inscriptions of a victory altar (*ara*) found in 1992 in the gravels of the pre-alpine river Lech near *Augusta Vindelicorum* (Augsburg, DE)<sup>2</sup>. An imposing 1.56 m high and almost 1 m wide, the *ara* gives evidence of a battle that took place in the late spring of AD 260. On 24<sup>th</sup>/25<sup>th</sup> of April, a muster of makeshift motley troops (especially militia) from the border provinces of *Raetia* and *Germania Superior* gained a victory over invading units of *Juthungi* and *Semnonnes*. In doing so, they freed thousands of captured Italics:

*In h(onorem) d(omus) d(ivinae) // [[[pro sal(ute) Imp(eratoris)]]] Sev[[er]]i / [[[Alexandri Aug(usti)]]] / [[[----- // In h(onorem) d(omus) d(ivinae) / deae sanctae Victoriae / ob barbaros gentis Semnonum / sive Iouthungorum die / VIII et VII Kal(endarum) Maiar(um) caesos / fugatosque a militibus prov(inciae) / Raetiae sed et Germanicianis / itemque popularibus excussis / multis milibus Italorum captivor(um) / compos votorum suorum / [[M(arcus) Simplicinius Genialis v(ir) p(erfectissimus) a(gens) v(ices) p(raesidis)]] / [[cum eodem exercitu]] / libens merito posuit / dedicata III Idus Septemb(res) Imp(eratore) d(omino) n(ostro) / [[Postumo Au]]g(usto) et [[Honoratiano consulibus]] (AE 2001, 1561)<sup>3</sup>.*

The inscription mirrors the unrest and upheaval arriving at the periphery of the Empire during the course of the 3<sup>rd</sup> century AD in many ways. On the one hand, it shows that the raids and plunderings by Germanic groups, which had been ongoing since late Severan times, were not only hitting the *limes* regions but that the raids were already reaching the Italic motherland ("*Italorum captivor[um]*"). On the other hand, the weakened military infrastructure of the northwest borders on the rivers Rhine and Danube is displayed very well in the inscrip-

<sup>1</sup> Inscription (CIL III, 5810) from *Augusta Vindelicorum* (Augsburg, DE): *Providentissimo / principi rectori / orbis ac domino / fundatori pacis / aeternae / Diocletiano imp(eratori) / invicto Aug(usto) pont(ifici) / max(imo) Ger(manico) max(imo) Pers(ico) / max(imo) trib(unicia) pot(estate) VII / co(n)s(uli) III patri pat(riae) / proco(n)s(uli) Sept(imius) / [Val]entio v(ir) p(erfectissimus) p(raeses) p(rovinciae) R(aetiae) / d(evotus) n(umini) m(aiestatique) eiusdem.*

<sup>2</sup> BAKKER 1993, 369–386.

<sup>3</sup> SCHALLMAYER 1995, 17–19 fig. 8–9. – Cf. K.-P. JOHNE, *Semnonen am Lech. Der Augsburger Victoria-Altar und die Historia Augusta*. In: M. Meyer (ed.), "... trans Albim fluvium". Forschungen zur vorrömischen, kaiserzeitlichen und mittelalterlichen Archäologie. Festschr. für Achim Leube zum 65. Geburtstag. Internat. Arch., Stud. honoraria 10 (Rahden/W. 2001) 299–306.

tion. In this way, Lothar Bakker interprets the “*militibus prov(inciae) Raetiae sed et germanicianis*” mentioned in the inscription as the residual contingent of troops spared by the Germanic raids of former years<sup>4</sup>. The reduced capacities of the Roman military are underlined by the fact that *legio III Italica*, stationed in *Castra Regina* (Regensburg, Germany) and supposedly in charge of the Raetian provincial area, is not mentioned in the inscription (anymore)<sup>5</sup>. The victory gained by the local governor (*praeses*) Marcus Simplicinius Genialis was, however, just a last rise up of arms, which is shown by the abandonment of the areas north of the Danube in the subsequent years. The following turbulent decades were characterized by numerous raids, plunderings and destructions by different barbaric (Germanic?) groups, especially along the river borders of Rhine and Danube<sup>6</sup>. Not only civil settlements and cities but military garrisons as well show in part extensive destruction layers caused by fire<sup>7</sup>.

After the serious problems encountered by the Empire in the second and third quarter of

the 3<sup>rd</sup> century, the Tetrarchy brings a period of calm and prosperity. With the implementation of extensive reforms under Emperor Gaius Aurelius Valerius Diocletianus and the establishing of the tetrarchic regime, a relatively peaceful period at the borders followed, which allowed the promotion of a programme for the reconstruction and consolidation of the Danube limes<sup>8</sup>. At the beginning of the 6<sup>th</sup> century AD, the historian *Zosimus* provides written evidence for this calm period: “*For the Roman Empire, as I have related, was, by the care of Diocletian, protected on its remote frontiers by towns and fortresses, in which soldiers were placed. It was consequently impossible for the barbarians to pass them, there being always a sufficient force to oppose their inroads*”<sup>9</sup>.

Even though this kind of literary sources and also some epigraphic data indicate a large building programme, the tetrarchic fortifications along the Danube river in the Central and Eastern European area of the late Empire remain – if compared to the well-testified later building measures by Emperor Valentinian I<sup>10</sup> – for now insufficiently known from the archaeological point of view<sup>11</sup>. The main reasons for this are in

<sup>4</sup> BAKKER 1993, 377.

<sup>5</sup> SCHALLMAYER 1995, 25.

<sup>6</sup> Among numerous hoards and treasure troves of the late 3<sup>rd</sup> century (e.g. S. KÜNZL/E. KÜNZL, *Der Fund von Neupotz. Die historische Momentaufnahme der Plünderung einer römischen Domäne in Gallien*. In: E. Künzl, *Die Alamannenbeute aus dem Rhein bei Neupotz. Plünderungsgut aus dem römischen Gallien. Teil 1: Untersuchungen*. Monogr. RGZM 34 [Mainz 1993] 473–504, figs. 7–8), the so-called Alamannenbeute found in the Rhine near Neupotz is mentioned exemplarily here. The ensemble consists of hundreds of silver and bronze vessels which were robbed by Germanic groups in Gallia and Hispania. When crossing the Rhine, the completely overloaded ship capsized near Neupotz.

<sup>7</sup> These could be documented, for example, in the Raetian *castra* of Burghöfe a. d. Oberen Donau (AD 271/272–282), Regensburg (legionary camp, AD 283) and *Rostrum Nemaviae*/Goldberg b. Türkheim (AD 282) (M. MACKENSEN, *Archäologisch-historische Auswertung – Submuntorium in der späten römischen Kaiserzeit*. In: Idem/F. Schimmer [eds.], *Der römische Militärplatz Submuntorium/Burghöfe an der Donau. Archäologische Untersuchungen im spätrömischen Kastell und Vicus 2001–2007*. Müncher Beitr. Prov. Arch. 4 [Wiesbaden 2013] 395–425 here 401 f.) as well as in the *castra* of Schlögen in Noricum (shortly after AD 300) (PLOYER 2013, 18), Mautern (AD 251) (IDEM 2018, 89) and Tulln (shortly after AD 258 and AD 283) (M. KANDLER/H. VETTERS, *Der römische Limes in Österreich*<sup>2</sup> [Wien 1989] 157).

<sup>8</sup> MACKENSEN 1995, 50; M. VASIĆ, *Le limes et l’intérieur des provinces de Moesia Prima et de Dacia à l’époque de la Tétrarchie*. In: M. Zahariade (ed.), *Die Archäologie und Geschichte der Region des Eisernen Tores zwischen 275–602 n. Chr. Kolloquium in Drobeta-Turnu Severin (2.–5. November 2001)*. Jugoslawisch-Rumänische Kommission für die Erforschung der Region des Eisernen Tores. Arch. Abt. 4 (București 2003) 17–23.

<sup>9</sup> *Zosimus* II, 34, 1.

<sup>10</sup> In contrast to the comparatively small stock of tetrarchic guard towers (*burgi*) discussed here, there are surprisingly many Valentinian complexes. Most of those have a building inscription (which the tetrarchic towers often lack) and can thus be clearly dated to the building programme of the seventies of the 4<sup>th</sup> century AD: for example Laufen (Koblenz) (building inscription: AD 371: CIL XIII, 11537; O. SCHULTHESS, *Die Bauinschrift der Römerwarte beim Kleinen Laufen bei Koblenz*. Anz. Schweizer. Altkde. 9.3, 1907, 190–197; R. DEGEN, *Spätrömische Befestigung am Rhein: Weiach, Koblenz und Zurzach*. *Helvetia Arch.* 1, 41–49 here 43 f.), Ybbs a. d. Donau (building inscription: AD 370; CIL III, 5670a; PLOYER 2018, 62) and guard tower 2 of Visegrád-Lepence (building inscription: AD 371: AE 2000, 1223; L. BORHY, *Die letzten Jahrzehnte der Erforschung des spätrömisch-pannonischen Limes seit Sándor Sopronis „Die letzten Jahrzehnte ...“ – Ein Überblick*. In: HEINRICH-TAMÁSKA 2011a, 29–46 here 33).

<sup>11</sup> This is frequently a circular argument because many

many cases the age of the available archaeological information or rather the lack of modern and extensive archaeological research, additionally complicated by overlying deposits or disturbances from later periods – in particular from the early and high Medieval time, in the Balkans from the early Byzantine time as well. As soon as the existing dating approaches are examined carefully, however, it becomes apparent that research is often caught in traditional dating based on literary and historical considerations (e.g. thinking of extensive “construction programmes” for whole provinces, *limites* or even the entire Empire with regards to the historical tradition) without data for individual sites based on concrete, specific and reliable stratigraphic, epigraphic or even scientific evidence being present<sup>12</sup>.

A therefore advisable critical revision of all these chronological classifications or only allegedly “dated sites” cannot be achieved in this short paper. Nevertheless, the authors have

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complexes have been ascribed to the Valentinian building programme due to the lack of datable finds or missing building inscriptions. Compare, for example, the typical reasoning regarding the tower of Dömös-Kövespatak: “nach dem Grundriss unter Valentinian I erbaut” (“according to the layout built under Valentinian I”) (S. SOPRONI, Die letzten Jahrzehnte des pannonischen Limes. Münchner Beitr. Vor- u. Frühgesch. 38 [München 1985] 30). It has to be assumed that a large number of older complexes is hidden among the complexes classified as Valentinian, as is hinted at in Cod. Theo. 15.1.13: “*eas turres, quas refici oportet*”. Therefore, it is conceivable that, as A. MÓCSY (Die spätrömischen Schiffslände in Contra Florentiam. Folia Arch. 10, 1958, 89–104 here 103) suspected, “nur die wenigen, mit Inschriften versehenen *burgi* valentinianisch sind, die anderen aber unter Valentinian höchstens nur ausgebessert wurden” (“only the few *burgi* furnished with inscriptions are Valentinian, the others, however, were at most just repaired under Valentinian’s rule”).

<sup>12</sup> Compare, for example, also the different attempts to identify construction programmes by comparing building measurements and proportions: G. MILOŠEVIĆ, Modular analysis of Late Roman and Early Byzantine Fortifications in the Iron Gate Area. In: Roman Limes on the Middle and Lower Danube. Cahier des Portes de Fer, Monogr. 2 (Belgrad 1996) 249–252; M. NAGY, A pannoniai IV. századi burgustípusok méretei (Dimensions of 4<sup>th</sup> century A.D. burgus-types in Pannonia). In: A. Gaál (ed.), Pannoniai Kutatások. A Soproni Sándor emlékkonferencia előadásai. Bölcske, 1998 október 7. Wosinsky Mór Múz. (Szekszárd 1999) 133–140.

particularly tried to name the literary key sources and the archaeological key features (fixed points) as well as the state of research, referring not only to purely archaeological, but also to epigraphic evidence (building inscriptions on the one hand, but also small inscriptions like brick stamps on the other hand) for the entire, almost 3,000 km long, “wet border” (*ripa*) between the High Rhine and the Black Sea. Keeping in mind the reorganisation of the Empire realized by Diocletian, this concerns the late Roman provinces of *Maxima Sequanorum*, *Raetia Secunda*, *Noricum Ripense*, *Pannonia Prima & Secunda*, *Valeria*, *Moesia Prima & Secunda*, *Dacia Ripensis* and *Scythia*. In doing so, it is important to address also defensive sites as far away as *Dalmatia* because they protected the supply lines even if they were situated in the hinterland, set back from the borderline itself (fig. 1)<sup>13</sup>.

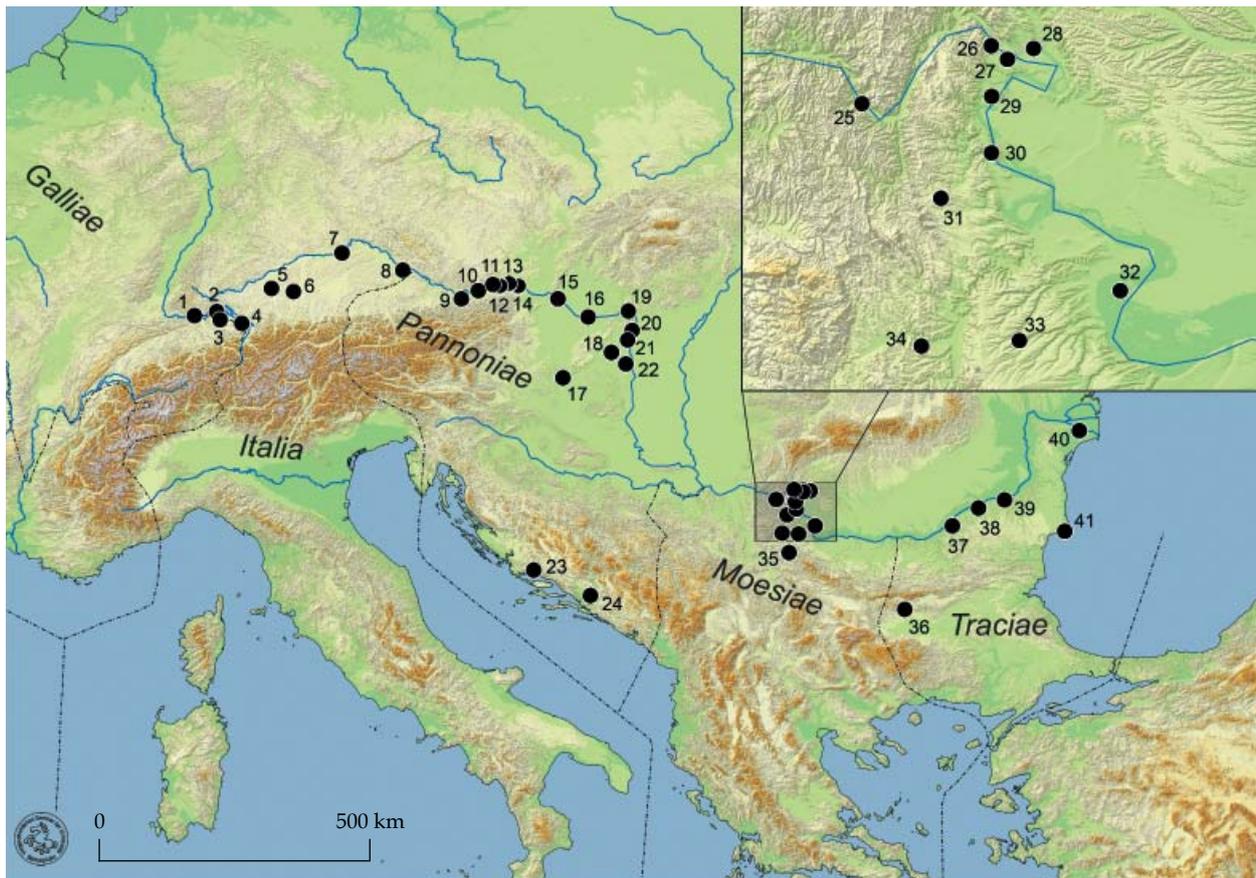
## Building activities along the Limes

For the lower Danube Limes, especially in *Moesia Secunda*, the restoration of the forts during the tetrarchic period is documented by the spreading of stamped bricks produced in the workshops belonging to the legions *XIII Gemina*, *V Macedonica*, *I Italica*, *XI Claudia*, *I Iovia*<sup>14</sup>. Even though some authors have tried to systematize existing data<sup>15</sup>, the archaeological documentati-

<sup>13</sup> The excellent summary for *Gallia* and the river border of *Germania Prima* by Raymond Brulet is still to be recommended, see M. REDDÉ et. al. L’architecture de la Gaule romaine: Les fortifications militaire, Documents d’arch. française 100 (Paris 2006) 44–66 and 155–179, recently also: R. BRULET, Ad Intima Galliarum. In: SOMMER/MATEŠIĆ 2018, 480–486.

<sup>14</sup> T. SARNOWSKI, Die Legio I Italica und der untere Donauabschnitt der Notitia Dignitatum. *Germania* 63, 1985, 107–127. – Cf. the interesting methodical approach regarding the bridgehead fortification *Divitia* (Köln-Deutz) in *Germania Secunda*: N. HANEL/U. VERSTEGEN, Gestempelte Ziegel aus dem spätantiken Militärlager Köln-Deutz (Divitia). *Rei Cretariae Romanae Fautorum Acta* 39, 2005, 187–191. – For Pannonia see B. LÓRINCZ, Organisatorische Fragen der Herstellung und Verwendung von Ziegelstempeln. *Specimina Nova* 7, 1991, 191–211; IDEM, Pannonische Stempelziegel II. *Limes-Strecke Vetus Salina-Intercisa*. *Diss. Arch.* II,7 (Budapest 1979).

<sup>15</sup> M. ZAHARIADE, The Tetrarchic Building Inscriptions and the Lower Danubian Limes. In: *Atti del XI Congr. Internaz. di Epigrafia Greca e Latina*, Roma 1997 (Roma 1999) 553–561; IDEM, The Tetrarchic Reorgani-



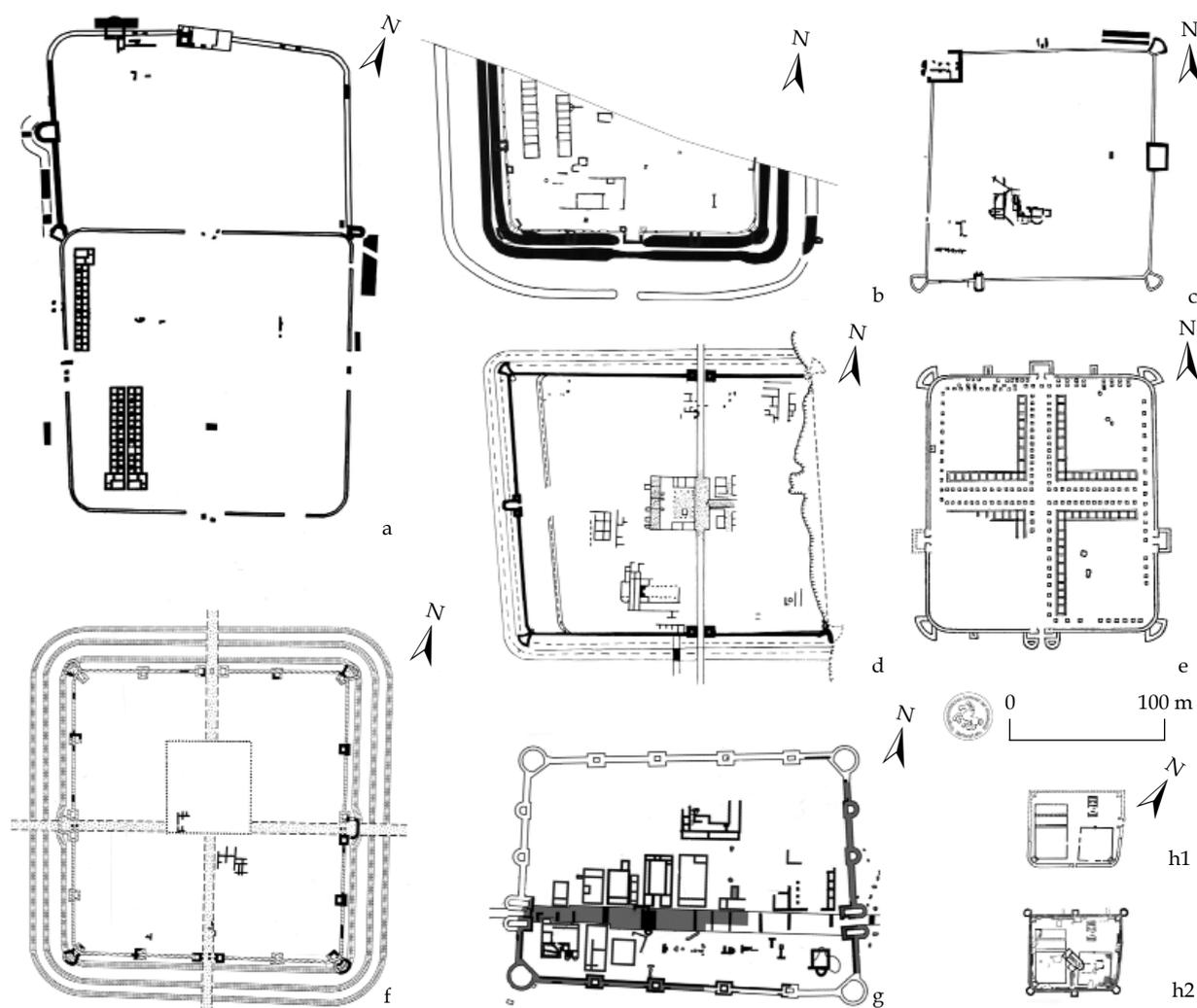
**Fig. 1** Map of the northern Roman frontier along the Danube between the High Rhine and the Black Sea, showing the dioceses system after the reform of Diocletian. Indicated are the main sites mentioned in the text: **1** *Tenedo* (Zurzach, CH); **2** *Tasgetium* (Stein am Rhein, CH); **3** *Ad Fines* (Pfy, CH); **4** *Arbor Felix* (Arbon, CH); **5** *Caelius Mons* (Kellmünz, DE); **6** Goldberg, Türkheim, DE; **7** *Abusina* (Eining, DE); **8** *Boiotro* (Passau-Innstadt, AT); **9** Mauer bei Amstetten, AT; **10** Pöchlarn, AT; **11** *Favianis* (Mautern, AT); **12** Traismauern, AT; **13** Zwentendorf, AT; **14** Zeiselmauer, AT; **15** *Gerulata* (Rusovče, SK); **16** Ács-Vaspuszta, HU; **17** Keszthely-Fenekpuszta, HU; **18** *Gorsium* (Tác, HU); **19** *Castra ad Herculem* (Pilismarót, HU); **20** *Contra Aquincum* (Budapest, HU); **21** Nagytétény, HU; **22** *Intercisa* (Dunaújváros, HU); **23** Split, HR; **24** Mogorelo (Čapljina, BIH); **25** *Smorna* (Boljetin, SRB); **26** *Diana* (Karataš, SRB); **27** Donje Butorke, SRB; **28** *Drobeta* (Turnu Severin, RO); **29** Ljubičevac, SRB; **30** Mihajlovac-Mora Vagei, SRB; **31** Šarkamen, SRB; **32** *Bononia* (Vidin, BG); **33** Kula, BG; **34** *Felix Romuliana* (Gamzigrad, SRB); **35** Rarna, SRB; **36** *Diokletianopolis* (Hisarya, BG); **37** *Sexaginta* (Prista, BG); **38** *Transmarisca* (Tutrakan, BG); **39** *Durostorum* (Silistra, BG); **40** *Halmyris* (Murighiol, RO); **41** *Tirisis/Acrae* (Kaliakra, BG). – Created by K. Bieber (Univ. of Marburg).

on is rather limited and prevents accurate identification of elements of military architecture specific to this period. It is quite possible that the defensive elements of the previous period were largely preserved with minor additions.

zation of the Limes Scythicus. In: L. Vagalinski, *The Lower Danube in Antiquity* (6<sup>th</sup> century BC – 6<sup>th</sup> century AD). Internat. Arch. Conf., Bulgaria-Tutrakan, 6.–7.10.2005 (Sofia 2007) 293–304. – Cf. C. WHATLEY, *Making sense of the frontier armies in late antiquity: An historian's perspective*. In: R. Collins/M. Symonds/M. Weber (eds.), *Roman military Architecture on the Frontiers in Late Antiquity* (Oxford 2015) 6–17 here 11–15.

Corresponding to this, modern stratigraphic and architectural research in the provinces *Noricum Ripense*, *Pannonia I* and *Valeria* has provided many pieces of evidence for a similar build-up of fortifications during the Diocletian-tetrarchic era in several older *limes castra* of the middle Imperial period (“*Limeszeit*”). Above all, the adaptation of existing Imperial complexes like Mautern, Traismauer, Zeiselmauer, Pöchlarn, Zwentendorf (AT), Ács-Vaspuszta and Nagytétény (HU) has to be mentioned here (fig. 2)<sup>16</sup>.

<sup>16</sup> For a summary for *Noricum Ripense* see A. STUPPNER, *Zur Kontinuität in der Spätantike am norisch-pan-*



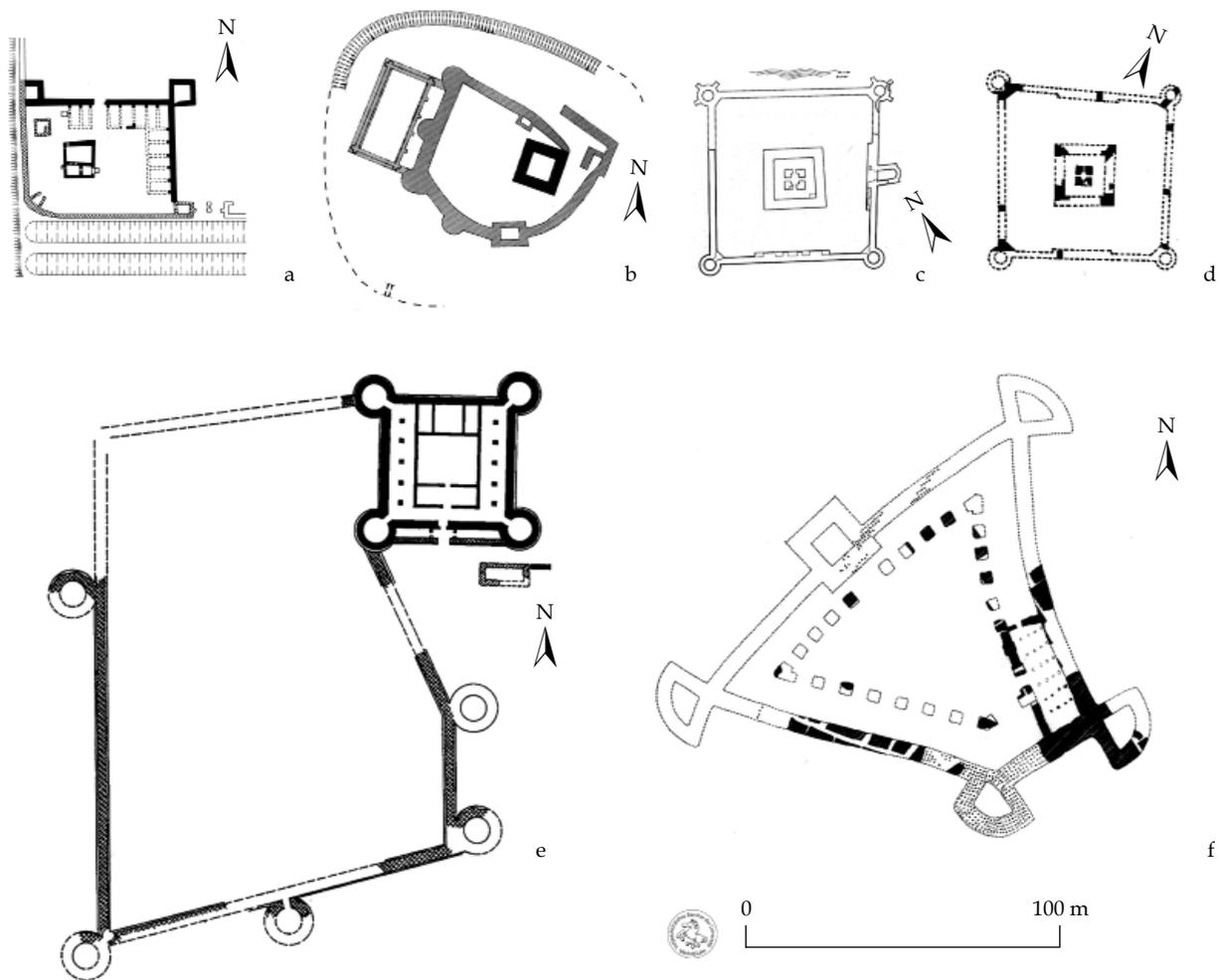
**Fig. 2** Examples of the architectural transformation of earlier Imperial fortifications (*Limeskastelle*): **a** *Favianis* (Mautern, AT); **b** *Zwentendorf* (AT); **c** *Zeiselmayer* (AT); **d** *Intercisa* (Dunaújváros, HU); **e** *Drobeta* (Turnu Severin, RO); **f** *Campona* (Nagyttény, HU); **g** *Mauer* near Amstetten (AT); **h** *Smorna* (Boljetin, SRB), earlier (1) and later (2) building phase. – a–c after PLOYER 2013, 66 fig. 40; 82 fig. 50; 90 fig. 61. – d after FITZ 1976, 102. – e after TEICHNER 2018, 318 fig. 17I. – f after VISY 1988, 89 fig. 84. – g after GROH 2017, 105 fig. 6. – h1 after GUDEA 2001, 67–69 fig. 12h. – h2 after ZOTOVIĆ 1984, 213 fig. 2. – Created by K. Bieber (Univ. of Marburg).

All complexes have in common that the fortifications were adapted by different, in some cases very complex modifications to the requirements of late Antiquity. Most significant are the modifications concerning the intermediate and corner towers. While before, in the earlier and middle Roman Imperial period, they were situ-

ated on the inside of the rampart, they are replaced now, in tetrarchic times, by new U-shaped and fan-shaped towers that protrude from the wall, e.g. in Mautern, Traismauer, Zeiselmayer and Zwentendorf. In the case of Zwentendorf, this made not only the demolition of the existing corner towers necessary but also the filling in of the existing ditch of the fort<sup>17</sup>. A related

nonischen Limes in Niederösterreich. In: HEINRICH-TAMÁSKA 2011a, 72–80. – Ács-Vaspuszta: D. GABLER, Roman Fort at Ács-Vaspuszta, Hungary on the Danubian Limes. BAR Internat. Ser. 531 (Oxford 1989); L. KOCSIS, Restart of the research in the Roman castle of Campona in Nagyttény-Budapest, district XXII. (Preliminary report). *Specimina nova* 16, 2002, 183–198.

<sup>17</sup> The expansion of the towers would have made a reduction of the gates necessary, but has not been proved so far, neither architecturally nor stratigraphically (see fig. 2 of this paper): *Asturis* (Zwentendorf, fig. 2b), *Drobeta* (Turnu Severin, fig. 2e), *Campona* (Nagyttény, fig. 2f) and *Intercisa* (Dunaújváros, fig. 2d). – Cf. also VISY 1988, 59; FITZ 1976, 102; TÓTH 2009,



**Fig. 3** Examples from the tetrarchic period of a reduced fortification (a), *burgi* (b,f) and *quadriburgia* (c-e): **a** *Abusina* (Eining, DE); **b** Goldberg (DE); **c** Donje Butorke (SRB); **d** Ljubičevac (SRB); **e** Kula (BG); **f** *Boiotro* (Passau-Innstadt, DE). – a-b after MACKENSEN 2018, 53 fig. 9; 60 fig. 18. – c after CERMANOVIĆ-KUZMANOVIĆ 1977–1978, 128 fig. 1. – d after JEREMIĆ 2009, 46 fig. 34,3. – e after ATANASOVA/KABAKČIEVA/JOCOVA 2005, 52 fig. 1. – f after ALTIJOHANN/VASÁROS 2001, 125 fig. 2. – Created by K. Bieber (Univ. of Marburg).

example from the middle Danube is the Iron Gates camp in *Diana* (Karataš, SRB), where the number of gates was reduced while the number of towers was increased<sup>18</sup>. In *Smorna* (Boljetin, SRB), a *castrum* also situated in the Iron Gates, the transition is even more visible: two corners of the *castrum* obviously still have the rounded shape of the middle Imperial period whereas the other two already have a rectangular shape fortified with towers (fig. 2h1–2)<sup>19</sup>.

A completely different kind of adaptation of former middle Imperial *limes* camps to the new requirements of fortification and also the changed troop strength is represented by the *castrum Abusina* (Eining, DE) situated on the southern bank of the Danube in the province of *Raetia II*. In contrast to the already mentioned sites above, no additions or modifications can be observed. Instead, the complex of the middle Imperial auxiliary fort was radically reduced from 1.8 ha to a core building (45 m x 34 m) in the southwest corner during Diocletian times (fig. 3a)<sup>20</sup>. Two new walls, both 1.8 m thick, were added while for the remaining two sides the walls of the Im-

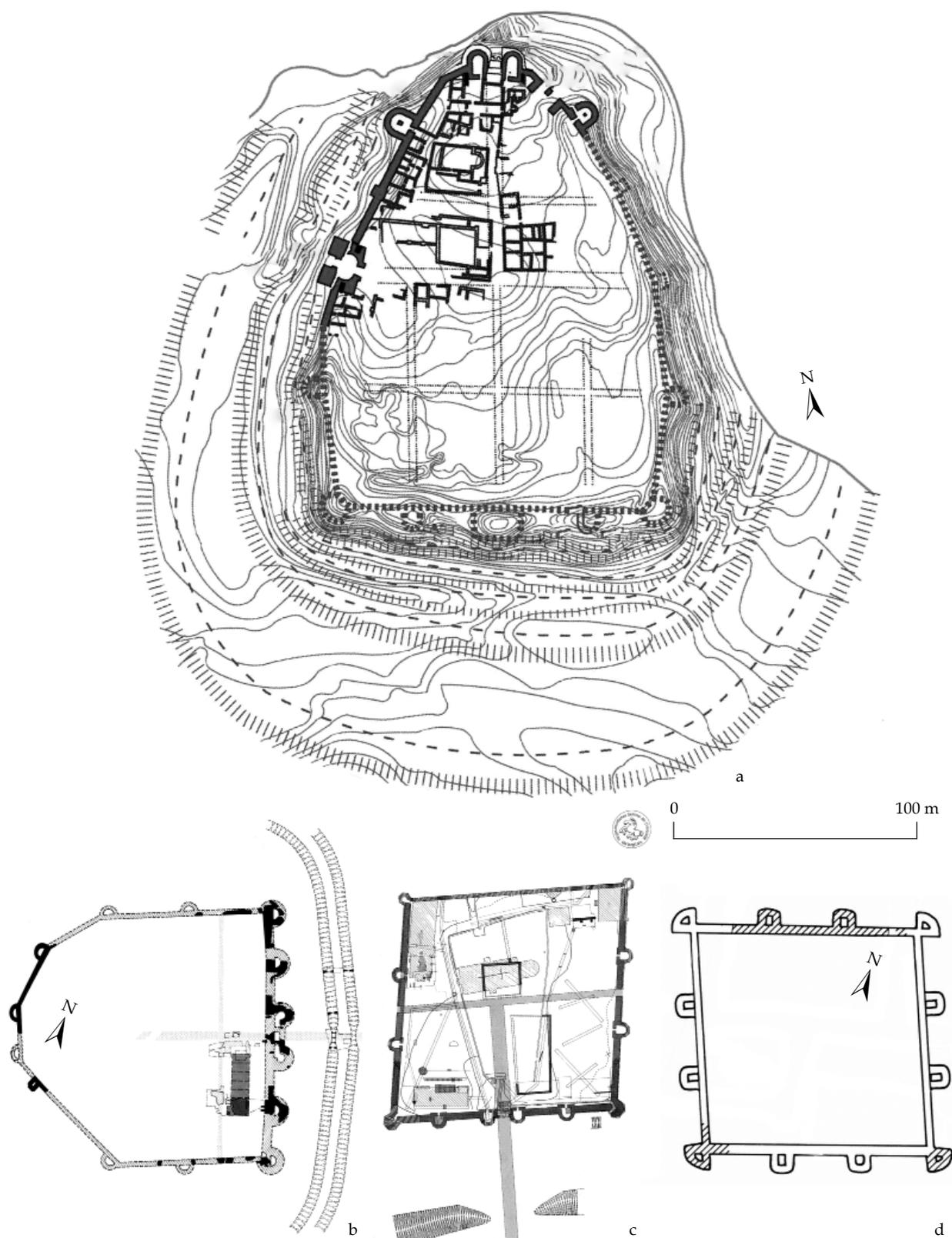
51 fig. 12 (*Odiavum*, Almásfüzitő); J. KONDIĆ, The earliest fortifications of Diana. In: P. Petrović (ed.), *Roman Limes on the Middle Danube* (Belgrad 1996) 81–86 here 82 fig. 1 (*Diana*, Karataš) and VISY 1988, 77 f. (*Ulcisia Castra*).

<sup>18</sup> JĘCZMIENOWSKI 2017, 98 fig. 1.

<sup>19</sup> ZOTOVIĆ 1984; JĘCZMIENOWSKI 2017, 98 fig. 3,3. – Cf.

GUDEA 2001, 67–69.

<sup>20</sup> MACKENSEN 1994b, 480 esp. note 3; GSCHWIND 2004, 77.



**Fig. 4** Examples of *ex-novo* fortifications from the tetrarchic period: **a** *Halmyris* (Murighiol, RO); **b** *Caelius Mons* (Kellmünz, DE); **c** *Tasgetium* (Stein am Rhein, CH); **d** *Contra Aquincum* (Budapest, HU). – a after MĂRGINEANU CĂRSTOIU/APOSTOL 2015, fig. 1. – b after MACKENSEN 2018, 55 fig. 11. – c after HASLER et al. 2005, 86 fig. 76. – d after POLENZ 1986, 95 fig. 33. – Created by K. Bieber (Univ. of Marburg).

perial curtain wall continued to be used. The west tower of the *porta principalis dextra* and the southwest corner tower were also included in the new late Roman fortification. The northwest intermediate tower from the middle Imperial period, on the other hand, was demolished and replaced by a new tower (7.4 m x 8 m). As its counterpart, a second tower was newly built in the northeast (6.8 m x 7 m). Thus the interior only reached a size of 0.15 ha. Twelve rooms were attached to the northern and eastern walls, thought to be *contubernia* with two levels. In the centre, there was a detached stone building, probably a *principia cum praetorio*<sup>21</sup>. The reduction of individual contingents of troops, especially of the border troops (*riparienses* and *limitanei*) in the area of the middle Danube region, is reflected in the way how some of the forts were rebuilt. They stand for a building programme characterized by the erection of a massive tower in the form of a *tetrapylon* (actually a *burgus*) in the corner of some former auxiliary forts, for example in the Pannonian *Gerulata* (Rusovče, SK)<sup>22</sup>. The architecture of this type of fortification, of the *burgus* in the form of a *tetrapylon*, has been identified at sites like Zeiselmauer, Rusovče, Donje Butorke (fig. 3c), Ljubičevac (fig. 3d) and Mihajlovac-Mora Vagei. It has to be seen as proof of an important building programme, probably applied on a much larger scale than the findings so far suggest<sup>23</sup>. The standard dimensions of this type of fortification are c. 20 m x 20 m, and the wall thickness varies between 2 and 3 m<sup>24</sup>.

With regard to these new constructions, one of the problems still unresolved is the interpretation of the term *praesidium* in the series of inscriptions known from the Lower Danube area: Donje Butorke (Kladovo, SRB, c. AD 294–300), *Sexaginta Prista* (Ruse, BG, c. AD 298–301), *Transmarisca* (Tutrakan, BG, AD 297), *Durostorum* (Siliistra, BG; after AD 297), *Halmyris* (Murighiol,

RO, c. AD 301–305) and possibly also Seimeni (RO)<sup>25</sup>. The text of the inscriptions was probably standardized in the Imperial Chancery and repeated whenever a construction was completed<sup>26</sup>. Because four of the inscriptions were discovered in important centres on the Danubian *limes* (*Sexaginta Prista*, *Transmarisca*, *Durostorum*, *Halmyris*), at first sight, the term *praesidium* could be linked to the fortifications known at these points all of which were strong bases for the late Roman military units deployed in the Lower Danube area. The only archaeological testimony in support of this hypothesis could be the walls of *Transmarisca*, enclosing a surface of 6.5 ha, dated stratigraphically to AD 292–309/310. As an important observation regarding the chronology of the enclosure's architecture, the excavators state that the original (tetrarchic) aspect of the enclosure is shown on the north side, equipped with rectangular towers, while the south side is reinforced with U-shaped towers added during the Constantinian period<sup>27</sup>.

However, the situation in Donje Butorke (near Kladovo, SRB) and Seimeni (RO), where *burgus*-type fortifications were identified, could point to the interpretation of the term *praesidium* as designating precisely this type of minor fortification<sup>28</sup> so that inscriptions found in the

<sup>25</sup> Donje Butorke: AE 1979, 0519; *Sexaginta Prista*: AE 1966, 0357, *Transmarisca*: CIL III, 06151, *Durostorum*: AE 1936, 0010, *Halmyris*: AE 1995, 1345, Seimeni: CIL III, 7487.

<sup>26</sup> T. SARNOWSKI, Die Anfänge der spätrömischen Militärorganisation des unteren Donaunraumes. In: H. Vettors (ed.), Akten des 14. Internationalen Limeskongresses 1986 in Carnuntum (Wien 1990) 857; M. ZAHARIADE, The Halmyris Tetrarchic Inscription. *Zeitschr. Papyr. u. Epigr.* 119, 1997, 228–236 here 233. – Cf. H. COCIȘ, Watchtowers and burgus-type structures reflected in Roman epigraphic sources (1st–3rd century A.D.). *Rev. Bistriței* 30–31, 2016–2017, 43–51.

<sup>27</sup> L. VAGALINSKI, Die spätrömische nördliche Festungsmauer von Transmarisca. In: G. v. Bülow/A. Milčeva (eds.), *Der Limes an der unteren Donau von Diokletian bis Heraklios*. *Vortr. d. Internat. Konf. Svištov* (1.–5. September 1998) (Sofia 1999) 229–236; VAGALINSKI/E. PETKOV, New Data on the Fortifications of Late Antiquity Transmarisca. In: M. Vasić (ed.), *Felix Romuliana. 50 Years of Archaeological Excavations*. *Papers from the Internat. Conf., Zaječar*, 27<sup>th</sup>–29<sup>th</sup> October 2003 (Belgrade 2006) 105–109.

<sup>28</sup> TORBATOV 2002, 78 f.; IDEM, Terminologija za fortifikacionite saorazhenija prez rimskata i rannovizantijskata epoha. In: *Arheologija na balgarskite zemi – Archaeology of the Bulgarian Lands I* (Sofia 2004) 31–48

<sup>21</sup> MACKENSEN 1994b, 490–503; GSCHWIND 2004, 77–79.

<sup>22</sup> Identical in layout and features but dated to Valentinian times: *Cannabiaca* (Zeiselmauer), *Locus Felix* (Wallsee) and *Augustiana* (Traismauer), see for a summary: TEICHNER/DRĂGAN/DÜRR 2018, 427 f. tab. 1 fig. 4.

<sup>23</sup> BĂJENARU 2010, 166: “type 4a, with L-shaped pillars and external defensive ditches”.

<sup>24</sup> The most recent summary for the present-day Serbian area can be found in JEĆZMIENOWSKI 2017, 98 tab. 2 fig. 4.

large centres could more likely be interpreted as being brought as *spolia* from elsewhere. The complex of Donje Butorke (fig. 3c) consists of a massive tower in the form of a *tetrapylon* (19 m x 18.5 m), which was built in early tetrarchic times between AD 294 and 300 according to the building inscription<sup>29</sup>, encircled by the early Byzantine *quadriburgium* of 46 m x 45 m, dating to the 6<sup>th</sup> century AD<sup>30</sup>.

Besides the rebuilt fortifications and the minor fortifications (*burgi*), the *ex-novo* foundations of the 290s AD show – as expected – most clearly the characteristics of tetrarchic fortress construction. *Quadriburgia* are the most significant type of minor fortifications that appears in the tetrarchic period. An in-depth analysis of the known sites in the area of the dioceses of Thrace and Dacia suggests that only the site at Kula (BG) dates back to this time (fig. 3e)<sup>31</sup>, based on some architectural analogies with fortified palaces from *Felix Romuliana* (Gamzigrad, SRB, fig. 5a) and Vrelo-Šarkamen (SRB, fig. 5b)<sup>32</sup>. The fort at Kula has an internal area of 34 m x 34 m, 2.2 m thick walls and circular corner towers (12.5 m diameter). The adjoining *castellum* in the southwest part<sup>33</sup> was probably in use at the same time as the *quadriburgium*. Covering a surface of 1.8 ha, it was constructed using a technique similar to the one used in Vidin/*Bononia* (BG; towers with a round foundation and a decagonal exterior construction). The complex from Ravna in *Moesia* (Campsa, SRB; 42 m x 40 m) is another variety from the tetrarchic period with rectangular towers<sup>34</sup>. However, the dating of comparable sites is still discussed.

The forts at *Veldidena* (Wilten, Innsbruck, AT), Schaan in Liechtenstein, Irgenhausen (Kanton Zürich, CH), the port *castrum Brigantium* (Bregenz, AT) and the recently discovered fort of Aying (DE) are generally ascribed to the fortress construction programme of Emperor Valentinian I<sup>35</sup>. Above all, a dendrochronological date between AD 372 and 378 for the fort *Brigantium* underlines this chronological approach<sup>36</sup>.

The *quadriburgium* of Passau-Innstadt (DE) is a special sub-type because of its fan-shaped form (fig. 3f). This polygonal complex, too, has been previously considered Valentinian in several instances due to its superficial similarity to the *castrum* of Altrip (Upper Rhine, DE)<sup>37</sup>. After the destruction of the Imperial fort of *Boiodurum* (c. AD 260) the small, late antique *castrum Boiotrum* (0.13 ha) was built about 1 km to the west on the south bank of the river Inn<sup>38</sup>. The complex is of an irregular trapezoid shape, its front aligned to the riverbank. The outer walls have a depth of 2.5 to 2.8 m except for the narrow south side which is clearly more massive with its 3.8 m depth. Four protruding fan-shaped towers were added to fortify the corners. A possible entrance is situated on the north front facing the river. The southern wall of the fort was additionally protected by a ditch of 8.3 m width<sup>39</sup>. The construction of the small fort of Passau-Innstadt can be dated most likely to the reign of Diocletian based on the analysis of coins published by Hans-Jörg Kellner in 1986 as well as the results of the excavations carried out by Rainer Christlein during the 1970s, published recently by Michael Altjohann<sup>40</sup>.

here 36 f.; 46 f.

<sup>29</sup> AE 1979, 0519; CERMANOVIĆ-KUZMANOVIĆ 1977–1978, 131; 134 pl. 4,2.

<sup>30</sup> CERMANOVIĆ-KUZMANOVIĆ 1977–1978, 127–131; LANDER 1984, 185; BAJENARU 2010, 112–114.

<sup>31</sup> ATANASOVA/KABAKČIEVA/JOCOVA 2005. The identification with the ancient *Castra Martis* remains problematic, see BAJENARU 2010, 16; 141 f. – The *quadriburgia* of Basel (HÄCHLER/NÄF/SCHWARZ 2020, 351 Abb. 144) and Kloten (Ibid. 366 f. Abb. 156), located in the *Maxima sequanorum*, seem to have been erected in the second half of the 4<sup>th</sup> century, while the complex Oberranna (*Noricum ripense*) has a *burgus*-like previous building that probably dates back to the Imperial period (PLOYER 2018, 20 f.).

<sup>32</sup> BAJENARU 2010, 141 f.

<sup>33</sup> ATANASOVA/KABAKČIEVA/JOCOVA 2005, 43–47.

<sup>34</sup> JĘCZMIENOWSKI 2017, 98 f. fig. 3–4.

<sup>35</sup> J. W. E. FASSBINDER et al., Baustopp in der Römerzeit? Ein neu entdecktes spätantikes Kastell bei Aying. Arch. Jahr Bayern 2016, 2017, 93–96 here 96; MACKENSEN 2020, 33; Cf. TEICHNER/DRÄGAN/DÜRR 2018, 432 fig. 6E.

<sup>36</sup> CH. ERTEL, Das römische Hafenviertel von Brigantium/Bregenz. Schr. d. Voralberger Landesmus. Reihe A. Landschaftsgesch. u. Arch. 6 (Bregenz 1999) 20; G. GRABHER, Das spätromische Hafenkastell von Brigantium (Bregenz). In: HASLER et al. 2005, 68–71; N. HASLER, Das valentinianische Hafenkastell von Brigantium/Bregenz. In: Idem/A. Rudigier (eds.), Archäologie in Vorarlberg. Vorarlberg Mus. Schr. 15 (Bregenz 2015) 126–130.

<sup>37</sup> Summarized by PIETSCH 2000, 379 notes 560–561.

<sup>38</sup> ALTJOHANN 2012, 14.

<sup>39</sup> ALTJOHANN 2012, 54–58.

<sup>40</sup> R. CHRISTLEIN, Das spätromische Kastell Boiotro zu

A representative example of this new tetrarchic military architecture in the area of the Pannonian *limes* is *Contra Aquincum*, situated on the Danube's left bank (Budapest, HU), thus conserved in the heart of the Hungarian capital on the Március 15. Square (fig. 4d). It is a rectangular fortification (86 m x 84 m) with fan-shaped corner towers and U-shaped towers on the sides. Its walls are 3.4 m thick<sup>41</sup>. The site is identified as *Contra Acinco* mentioned in the *Consularia Constantinopolitana* for the year AD 294<sup>42</sup>. Such bridgehead fortifications are – because of the special topographic and strategic situation on a river border – part of the defensive programme on the whole northern river frontier (*ripa*) in late antiquity.

Up the river Danube, the fort of Stein am Rhein (High Rhine, CH) is dated by a building inscription, thus offering the possibility of a precise dating within the tetrarchic period (fig. 4c)<sup>43</sup>. The

*castrum* is situated on the southern shore of the Rhine on a moraine hill called “Auf Burg” with two steep slopes. Its groundplan has the shape of an equilateral parallelogram (91 m x 88 m), not of a square because the *castrum* follows the natural topography. At the corners towers with a polygonal groundplan were built; such fortification elements are also found as intermediate towers on the east and west side. The south side of the complex is clearly more massive. In addition to the corner and intermediate towers, the gate, too, was secured by two also polygonal towers and further by a ditch (6–12 m wide) in front of the wall<sup>44</sup>. Because of structural similarities like the intermediate and gate towers that jut slightly inwards into the enclosure and due to its exposed position, the fort of Stein am Rhein belongs to the same type as the forts of *Tenedo* (Zurzach, CH), *Ad Fines* (Pfyn, CH), *Arbor Felix* (Arbon, CH) and, to be covered below, the fort of Kellmünz (DE)<sup>45</sup>.

After the fall of the Upper Germanic-Raetian *limes*, a northern frontier zone was newly created stretching in the area of *Raetia II* and *Maxima Sequanorum*, the latter having been separated from the Germanic provinces under Diocletian. This frontier zone, a bit further to the east of Stein am Rhein, was secured by an independent fortification construction programme during that time. Thanks to the research carried out by Michael Mackensen, the Danube-Iller-Rhine *limes* can be considered an excellent example of the new defensive architecture on the borders in Diocletian-early tetrarchic times<sup>46</sup>. Based on the investigations in the newly erected fort of *Caelius Mons* (Kellmünz, DE: fig. 4b), the border line along the river Iller, which runs from sou-

Passau-Innstadt. Formen der Kontinuität am Donaulimes im raetisch-norischen Grenzbereich. In: J. Werner/E. Ewig (eds.), *Von der Spätantike zum frühen Mittelalter. Aktuelle Probleme in historischer und archäologischer Sicht*. Vortr. u. Forsch. 25 (Sigmaringen 1979) 91–123 here 105; H.-J. KELLNER, *Die Fundmünzen aus den Grabungen im spätrömischen Kastell Boioduro (Passau-Innstadt)*. Bayer. Vorgeschbl. 51, 1986, 273–284 here 274; most recently ALTJOHANN 2012, 93, 101.

<sup>41</sup> POLENZ 1986, 95 Abb. 33; T. NAGY, *Drei Jahre Limesforschungen in Ungarn*. In: *Actes du IXe Congrès International d'Études sur les Frontières Romaines*, Mamaia, 6–13 septembre 1972 (București, Köln, Wien 1974) 27–37 hier 33 f.; M. NÉMETH, *Contra Aquincum Fortress*. In: V. Zsolt (ed.), *The Roman Army in Pannonia. An Archaeological Guide of the Ripa Pannonica (Pécs 2003)* 201–203.

<sup>42</sup> Not. Dig. Occ. XXXIII, 48.

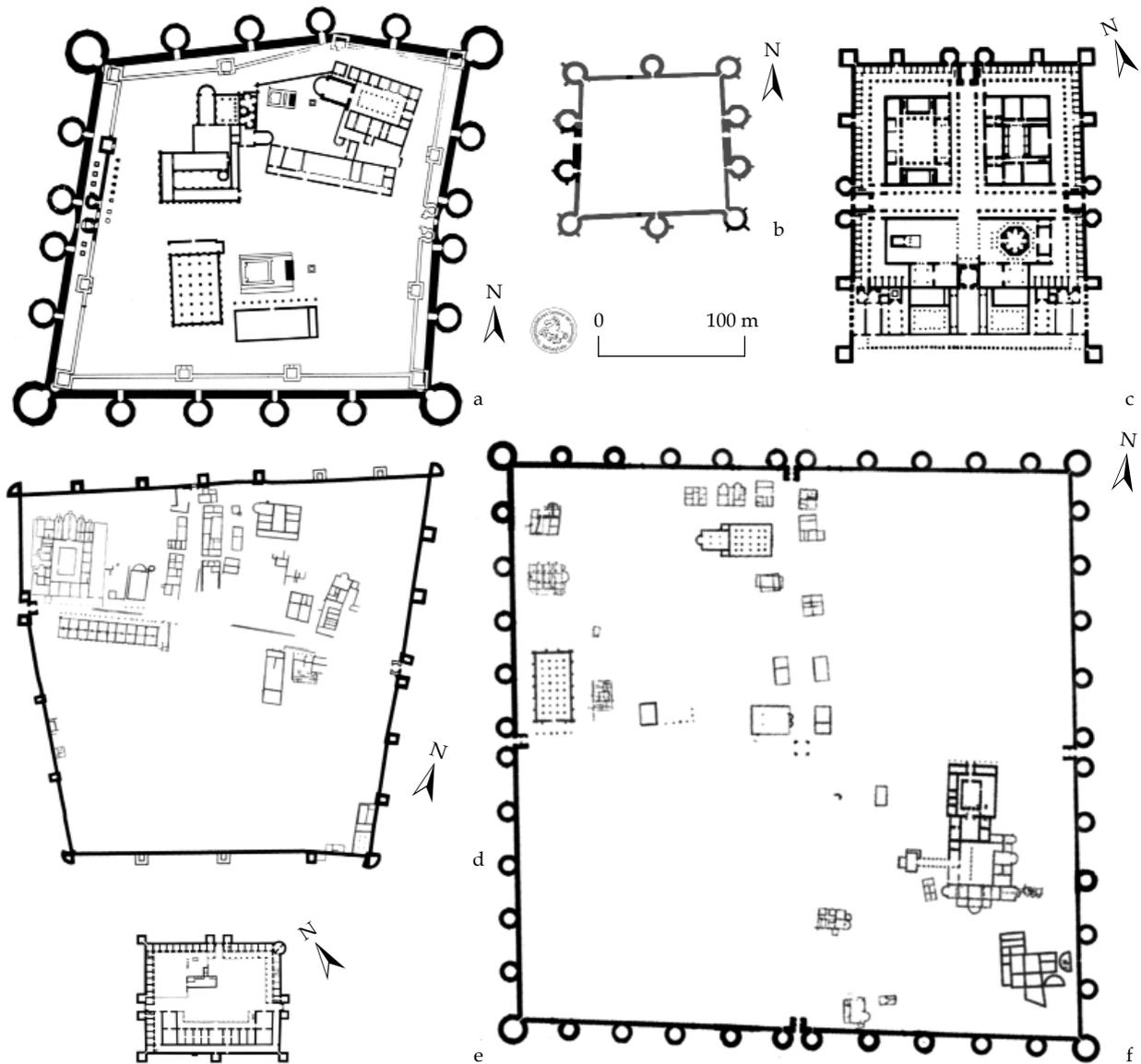
<sup>43</sup> AE 1993, 1227; CIL XIII, 05256; H. LIEB, *Die römischen Inschriften von Stein am Rhein bei Eschenz*. In: HÖHNEISEN 1993, 160–162; HÄCHLER/NÄF/SCHWARZ 2020, 128–130; G. KASCHUBA, *Lagertorinschriften im Imperium Romanum. Von claudisch-neronischer bis in diokletianische Zeit* (Diss. Regensburg) 90 f. no. 40 fig. 39. – A similar inscription was also found in Winterthur: CIL XIII, 5249; HÄCHLER/NÄF/SCHWARZ 2020, 124–127. – For the late Roman fortifications on the High Rhine in general see *ibid.*, in particular for the bridgehead fortifications see P.-A. SCHWARZ, *Die spätrömischen Befestigungsanlagen in Augusta Raurica – Ein Überblick*. In: BRIDGER/GILLES 1998, 105–111 here 108; IDEM, *Der spätantike Hochrhein-Limes*. In: Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart (ed.), *Am anderen Flussufer. Die Spätantike beiderseits des südlichen Oberrheins. Sur l'autre rive. L'Antiquité tardive de part et d'autre du*

*Rhin supérieur méridional*. Arch. Inf. Baden-Württemberg 81, 2019, 28–43.

<sup>44</sup> K. BÄNTELI, *Ergebnisse der Untersuchungen 1900–1987*. In: HÖHNEISEN 1993, 106–109.

<sup>45</sup> In this manner previously PETRIKOVITZ 1971, 193.

<sup>46</sup> MACKENSEN 1994a; IDEM 1995; IDEM, *Late Roman fortifications and building programmes in the province of Raetia: the evidence of recent excavations and some new reflections*. In: J. Creighton/R. J. A. Wilson (eds.), *Roman Germany. Studies in cultural interaction*. Journal Roman Arch. Suppl. Ser. 32 (Portsmouth 1999) 199–244; M. MACKENSEN, *Das tetrarchische Kastell Caelius Mons/Kellmünz am raetischen Donau-Iller-Limes*. In: BRIDGER/GILLES 1998, 119–135; MACKENSEN 2018; IDEM 2020.



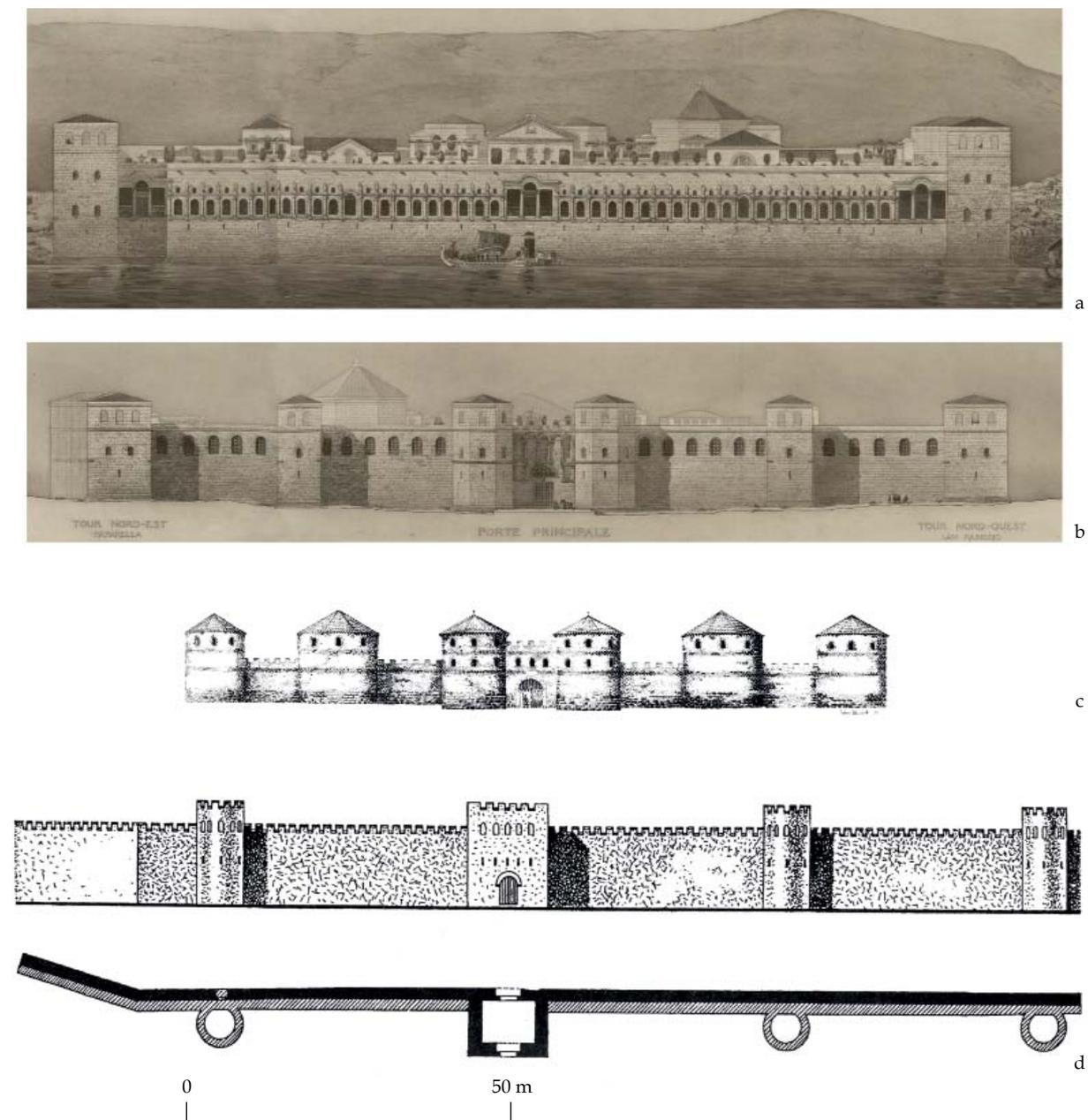
**Fig. 5** Fortified cities and residential complexes from the tetrarchic period: **a** *Felix Romuliana* (Gamzigrad, SRB), indicated are the older construction period with rectangular towers and the younger fortification with polygonal towers; **b** Šarkamen (SRB); **c** Spalato (HR); **d** *Gorsium/Herculia* (Tác, HU); **e** Mogorjelo (BIH); **f** Keszthely-Fenekpuszta (HU). – a; c; e after WILKES 1986, fig. 10–11, 13A. – b after SREJOVIĆ/TOMOVIĆ/VASIĆ 1996, 231–243. – d; f after HEINRICH-TAMÁSKA 2011c, 235 fig. 2; 240 fig. 5. – Created by K. Bieber (Univ. of Marburg).

th to north, becomes visible, a frontier that was newly created under Diocletian.

The late antique *castrum* of Kellmünz has been dated by stratigraphic evidence to the last years of the 3<sup>rd</sup> century AD and is situated on a high plateau directly above the river Iller<sup>47</sup>. It has a polygonal groundplan and encloses an internal space of 95.5 m x 101.5 m, resulting in a usable inner area of 0.86 ha. The main entrance

of the fort was located on the eastern side where the wall had a depth of up to 3.6 m. The 28 m wide gate consisted of two semicircular towers that jutted out of the fort's wall by up to 8 m. In addition, the eastern wall of the fort had two more half-rounded intermediate towers and two corner towers in the shape of a three-quarter circle. The other walls were fortified at different intervals by several semicircular towers and one tower in the form of a buttress. While these remaining sides were secured by natural obstacles like steep edges and slopes, also on

<sup>47</sup> For the dating of the oldest building phase of the *castrum*, cf. MACKENSEN 1995, 71; Cf. IDEM 2018.



**Fig. 6** Different reconstructions proposed for the exterior view (facade) of tetrarchic fortifications: **a–b** Diocletian's Palace at Split (HR), with seaside view (a) and landside view (b); **c** *Caelius Mons* (Kellmünz, DE); **d** *Tirisia/Acrae* (Kaliakra, BG). – a–b after HEBARD/ZEILER 1912, plate before p. 57. – c after MACKENSEN 2018, 55 fig. 12. – d after TORBATOV 2002, fig. 51. – Created by K. Bieber (Univ. of Marburg).

the side facing the river, against approaching enemies, the fort's eastern wall had a double ditch at a distance of 20 m. This double ditch ran only along this side of the fort and consisted of a V-shaped ditch that was 4.5 to 6 m wide and 2.5 m deep and a second, U-shaped ditch that was 6 m wide in front of the first<sup>48</sup>.

Taking the example of Kellmünz, all the characteristics of tetrarchic fortifications observed in the area of *Noricum ripense* and *Pannonia* area can be summarized once more<sup>49</sup>.

In comparison with the *castra* of the early and middle Imperial "*limes*" period, the relin-

<sup>48</sup> MACKENSEN 1995, 71–82.

<sup>49</sup> MACKENSEN 1994a, 159; PIETSCH 2000, 363; U. MAYR, Spätantike Wehranlagen. Kastelle, Castra, Wachtürme und Höhensiedlungen. In: HASLER et al. 2005, 18–26; TÓTH 2009, 53.

quishing of the strictly rectangular shape is the most obvious feature. This is surely the result of erecting forts on exposed hills or ridges and taking the topography of a location into account. Steep edges and slopes that are added natural obstacles against approaching enemies are combined with ditches that run only along those sides without natural barriers. As a result, both the topographic location and the construction of the fortification correspond to the late Roman fort at *Halmyris* (Danube Delta; fig 4a) already mentioned above, which most probably also dates back to the tetrarchic period.

Furthermore, the tetrarchic fortifications have more massive, deeper walls than the imperial ones. The curtain walls have a poured (concrete) core and two faces.

The semicircular intermediate towers and semicircular or three-quarter circle towers at the corners can be seen as innovations, too. The entrance situation changes as well, above all, the reduction of gates has to be mentioned in this context. Whereas earlier Imperial forts have four gates flanked by small rectangular towers, the tetrarchic forts like Kellmünz have just one central gate fortified with clearly protruding towers.

Moreover, the Diocletian/early tetrarchic Danube-Iller-Rhine *limes* was also protected by other types of military structures like the above-mentioned *praesidia* of the *burgus* type. A good example for this is the complex of Goldberg (near Türkheim, DE). It consists of a *burgus* tower (15 m x 15 m), the tetrarchic core<sup>50</sup>, while the expansion into a *castrum*-like complex seems to have happened only during a later phase (fig. 3b)<sup>51</sup>.

For the *ripa pannonica*, the fortification at Pilismarót (HU), identified with the toponym *Castra ad Herculem* from the *Itinerarium Antonini*, is considered an example of the new constructions of the Diocletian/tetrarchic period by many authors<sup>52</sup>. Even if the stratigraphic information is missing, the typology of the U-shaped towers

here is very similar to the situation known from the tetrarchic fortifications at *Ad Fines/Pfyn*, *Arbor Felix/Arbon* (*Maxima sequanorum*) and Kellmünz in *Raetia*. In contrast to the latter, the site of Pilismarót is not situated directly on the border, but at a distance of 1.8 km to the course of the modern Danube on an exposed hilltop at the foot of the Pilis Mountains. Besides the location and the irregular groundplan, the name *Castra ad Herculem* also indicates a foundation of the complex towards the end of the 3<sup>rd</sup> century<sup>53</sup>. Yet the appearance during this phase is not clear. Although the complex and its semicircular towers are reminiscent of the fort of Kellmünz, it has been pointed out that the towers were added to the walls in a later phase and thus cannot be dated to the Diocletian period<sup>54</sup>.

## Building activities in the Hinterland

The most important, but too often forgotten traces left by the tetrarchic construction programme are, however, to be found in the interior of the provinces. After the devastating Gothic and Germanic attacks during the middle of the 3<sup>rd</sup> century of which the urban centres were the main targets a vast programme of restoration of the hinterland, too, is documented by literary, epigraphic and sometimes archaeological sources, starting with Emperor Gallienus, continuing with Aurelianus and Probus, but reaching a maximum in the time of Diocletian and the Tetrarchy. The rest was a kind of militarization of the previously civil life in the provinces, even of those provinces that were not situated on the immediate external borders.

A first example for the militarization of previously civil life is the fort of Mauer (near Amsetten, AT) in the province of *Noricum Ripense* (fig. 2g)<sup>55</sup>. While the so far presented tetrarchic military structures immediately reused and added to *limes castra* from the early and middle Imperial period, the newly erected fort of Mauer was built on the grounds of the previously

<sup>50</sup> I. MOOSDORF-OTTINGER, *Der Goldberg bei Türkheim. Bericht über die Grabungen in den Jahren 1941-1944 und 1958-1961*. Münchner Beitr. Vor- u. Frühgesch. 24 (München 1981) 34.

<sup>51</sup> MACKENSEN 1995, 50.

<sup>52</sup> *Itin. Ant.* 266, 12. – Cf. SOPRONI 1978, 4-48; BARKÓCZI 1994, 92.

<sup>53</sup> VISY 1988, 71.

<sup>54</sup> For the latest critical consideration of the dating, see TÓTH 2009, 42 f.

<sup>55</sup> GROH 2017.

civil *vicus* of the garrison<sup>56</sup>. After a destruction event during the course of the 3<sup>rd</sup> century, a new *castrum* with a trapezoidal, slightly irregular groundplan was built. It was 213 m long in the south and is reconstructed as having been between 138 and 150 m wide in the west and east respectively. The inner area covered 2.91 ha. The enclosing wall is estimated as having had a depth of 4 m; it also had one gate on each narrow side. Both entrances consisted of two U-shaped towers, with each of the two towers in the east being 17.5 m long and 8.9 m wide. The towers did not line up with the enclosing wall but jutted outwards by 6.5 m and inwards by 7.2 m. While the narrow sides were secured by two semicircular towers each that also jutted slightly outwards and inwards, the long sides were protected by four rectangular towers (8.6–9.2 m x 10.8–11.2 m) at different intervals, with these towers also jutting slightly outwards and inwards. In the area of *Noricum Ripense*, the semicircular towers of 10.0 m x 10.9 m that slightly jut inwards are a new and so far unique observation. Based on its location in the hinterland of the *limes* and its massive fortification, the site has to be classified as an interior fortress.

For the western Carpathian Basin in general, or rather the Transdanubian area, the topic of these interior fortifications (“*Binnenfestungen* or *Innenbefestigungen*”) that are situated in the interior of a province was summarized and addressed for the first time by Aladár Radnóti<sup>57</sup>. Due to concentrated research during the last

decade, the site of Keszthely-Fenekpuszta (HU: fig. 5f) has developed into the key feature for these late Roman fortified structures to which sites like Környe, Ságvár und Alsóheténypuszta (all HU) can be added. The protruding circular towers are the special characteristic of these Pannonian interior fortifications. That the forts usually have multiple phases is indicated, amongst other things, by older U- and fan-shaped as well as rectangular towers lying beneath<sup>58</sup>. Based on mostly construction-technical arguments, different construction periods and datings have been suggested so far that cover almost the entire 4<sup>th</sup> century<sup>59</sup>; now, however, the new excavation results in Keszthely-Fenekpuszta rather point to a building time – outside our observation horizon – during the second third of the 4<sup>th</sup> century<sup>60</sup>.

Strictly from an archaeological point of view, the strong fortification in the Pannonian urban centre of *Gorsium/Herculia* (Tác, HU: fig. 5d) can be attributed to the period of the Tetrarchy<sup>61</sup>. Here, fan-shaped corner towers with a slightly arched front<sup>62</sup>, almost identical with those in *Contra Aquincum*, protected the former provincial city from then on. Further tetrarchic fortified settlements can be found on the Balkan Peninsula. A case in point is the oldest of the fortifications at *Tirisis/Acrae* (Kaliakra, BG) on the western Black Sea shore, which has protruding three-quarter circular towers and is dated to the period between Aurelian’s and the first decade of Diocletian’s reign, based on strati-

<sup>56</sup> The military fortification of an Imperial *vicus* area can also be observed in Winterthur (after AD 294) (HÄCHLER/NÄF/SCHWARZ 2020, 376) and Solothurn (around AD 325/30) (ibid. 370 f.).

<sup>57</sup> A. RADNÓTI, *Pannoniai városok élete a korai feudalizmusban*. Magyar Tudományos Akadémia II. Osztály Közl. 5, 1954, 487–508. – Cf. SOPRONI 1978, 138–155, 172–177. Questioning this in the meantime: O. HEINRICH-TAMÁSKA, *Pannonische Innenbefestigungen und die Kontinuitätsfrage*. Forschungsstand und -perspektiven. In: M. Konrad/Chr. Witschel (eds.), *Römische Legionslager in den Rhein- und Donauprovinzen. Nuclei spätantik-frühmittelalterlichen Lebens?* Bayerische Akad. Wiss. 138 (München 2011) 571–588; A. SZABÓ/ HEINRICH-TAMÁSKA, *Eine spätrömische Innenbefestigung in Környe*. In: HEINRICH-TAMÁSKA 2011a, 47–60; Zs. VISY, *Some Considerations on the Late Roman Fortification of Inner Pannonia*. In: SOMMER/MATEŠIĆ 2018, 447–453; O. HEINRICH-TAMÁSKA, *Castra and towns in the hinterland of the Limes during Late Antiquity: Pannonia and the provinces*

along the lower Danube in comparison. *Acta Arch. Carpathica* 52, 2017, 83–108.

<sup>58</sup> HEINRICH-TAMÁSKA 2011b, 655.

<sup>59</sup> O. HEINRICH-TAMÁSKA, *Bemerkungen zur Transformation spätantiker Strukturen in Pannonien am Beispiel von Keszthely-Fenekpuszta*. *Acta Arch. Carpathica* 42/43, 2007–2008, 2009, 208 f. esp. tab. 2.

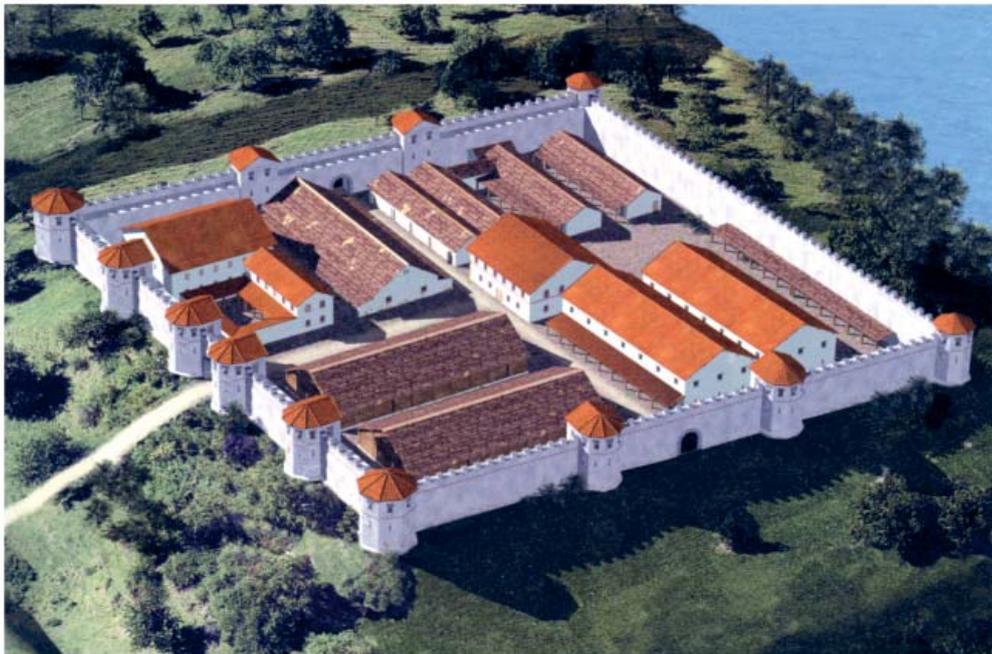
<sup>60</sup> HEINRICH-TAMÁSKA 2011b, 695. – It is interesting that *tetrapyla* which are known from Diocletian sites in the Orient (J. MÜHLENBROCK, *Tetrapylon*. *Zur Geschichte des viertorigen Bogenmonuments in der römischen Architektur* [München 2003] 229–273.) could be verified in the centre of the fort at Keszthely-Fenekpuszta. The *tetrapylon* in *Carnuntum* (also called ‘Heidentor’ = ‘Heathen’s Gate’), built in AD 308 on the occasion of the Congress of *Carnuntum*, is the only building dated with certainty in the working area see S. SOPRONI, *Das Heidentor in Carnuntum*. *Folia Arch.* 29, 1978, 125–133 here 130 f.

<sup>61</sup> BARKÓCZI 1994, fig. 19.

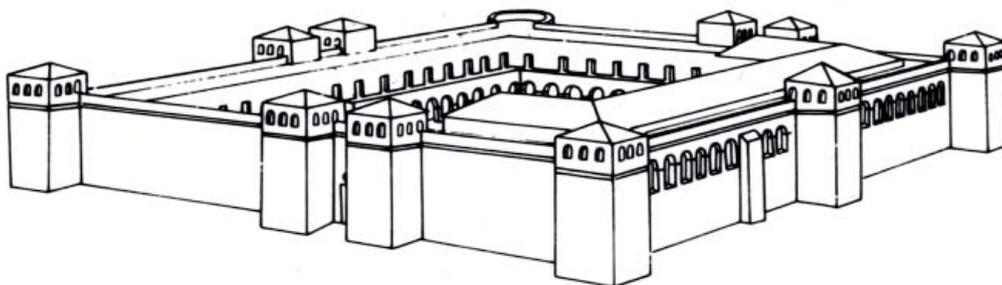
<sup>62</sup> Cf. LANDER 1984, 246 fig. 265.



a



b



c

**Fig. 7** Different reconstructions proposed for tetrarchic fortifications: **a** Diocletian's Palace at Split (HR); **b** *Tasgetium* (Stein am Rhein, CH); **c** Mogorjelo (Čapljina, BiH). – a after HEBARD/ZEILER 1912, plate after p. VIII. – b after HASLER et al. 2005, 89 fig. 81. – c. after WILKES 1986, 65 fig. 10 bottom. – Created by K. Bieber (Univ. of Marburg).

graphic observations (fig. 6d)<sup>63</sup>. But one of the most impressive structures originating from the Diocletian period is the city of *Diocletianopolis* (Hisarya, BG) in the province of Thrace. It has a powerful quadrangular, but irregular defence wall, enclosing an inner area of approx. 30 ha, with a series of rectangular towers on the sides and at the gates. Two corners were reinforced with massive octagonal towers (with circular foundations)<sup>64</sup>.

But of course, the most famous buildings belonging to the tetrarchic period in the Balkans are the fortified imperial residences. Following the model of Diocletian's retirement palace in Split (215 m x 175 m: fig. 5c)<sup>65</sup>, Galerius started to build his own palace at *Felix Romuliana* (Gamzigrad, SRB) in *Dacia Ripensis* (fig. 5a). With regard to the older, slightly smaller fortification of the site (c. 213 m x 180 m) and the only recently discovered *horrea extra muros* – respectively the stratigraphic investigations carried out there –, the first volume of the eagerly awaited final publication has just been released<sup>66</sup>. The defence wall that enclosed an area of 4.5 ha (c. 225 m x 210 m) was reinforced with 20 protruding polygonal intermediate towers and with four massive polygonal corner towers (external diameter of approx. 20 m see fig. 5a).

The same model was followed in the fortified residence at Šarkamen (Vrelo, SRB), probably built by *Maximinus Daia* (AD 305–313), but quite likely never completed (fig. 5b)<sup>67</sup>. It is a much

smaller complex (c. 92 m x 96 m, approx. 0.9 ha), with a 3 m thick defence wall and then massive polygonal towers (external diameter of approx. 16 m) – therefore creating a connection to the already mentioned *quadriburgia*.

The influence of the Split model is also encountered elsewhere in the Mediterranean province of *Dalmatia*, e.g. at Mogorjelo (Čapljina, BIH) with a fortified residence – possibly a production centre of an imperial estate (and identified most probably with the toponym *Ad Turres* mentioned on the Tabula Peutingeriana on the road *Narona–Diluntum*). The site was excavated during the Habsburg administration – an extremely fertile period for the archaeological research of the Balkan Peninsula which before had been occupied and oppressed by the Ottoman Empire – by the founder of the National Museum of Sarajevo, Karl Patsch<sup>68</sup>. With its dimensions of 92 m x 75 m, it is reinforced mainly with rectangular towers at the corners and at the gates, but also with one circular corner tower (fig. 5e)<sup>69</sup>.

## Conclusions

With this, our short overview of the tetrarchic architectural inventory between the High Rhine and the Black Sea has to end. Besides the architectural variety and characteristics, the problem of dating needs to be brought back to mind. As could be shown earlier, different new fortifications and forts had already developed along the late Roman Danube border (*ripa*) since the end of the 3<sup>rd</sup> century. Their development can be traced back to the disturbances in the second half of the 3<sup>rd</sup> century and be seen as part of a Diocletian/early tetrarchic border de-

<sup>63</sup> G. DŽINGOV/A BALKANSKA/M. JOSIFOVA, Kaliakra. I. Krepostno stroitelstvo (Sofia 1990); TORBATOV 2002, 226–232.

<sup>64</sup> K. MADŽAROV, Dioklecianopolis I (Sofija 1993).

<sup>65</sup> WILKES 1986. – Cf. G. Nikšić, Diocletian's Palace – design and construction. In: BÜLOW/ZABEHLICKY 2011, 187–203.

<sup>66</sup> G. v. BÜLOW, The two defence systems of the Late Roman Imperial Palace of Romuliana-Gamzigrad (*Dacia Ripensis*). In: R. Frederiksen et al. (ed.), Focus on Fortifications: New Research on Fortifications in the Ancient Mediterranean and the Near East (Oxford 2016) 314–324. – Cf. D. SREJOVIĆ, Felix Romuliana – Galerius' Ideological Testament. In: Idem (ed.), Roman Imperial Towns and Palaces in Serbia (Belgrade 1993) 29–53; G. v. BÜLOW/S. PETKOVIĆ (eds.), Gamzigrad-Studien 1. Ergebnisse der deutsch-serbischen Forschungen im Umfeld des Palastes Romuliana: Röm.-Germ. Forsch. 75 (Wiesbaden 2020).

<sup>67</sup> M. VASIĆ/M. TOMOVIĆ, Šarkamen (East Serbia). An Imperial Residence and Memorial Complex of the Tetrarchic Period. *Germania* 83, 2005, 257–307;

TOMOVIĆ/I. POPOVIĆ, Šarkamen (Eastern Serbia); a tetrarchic imperial palace – the memorial complex (Belgrade 2005); SREJOVIĆ/TOMOVIĆ/VASIĆ 1996, 231–243.

<sup>68</sup> C. PATSCH, Bosnien und Herzegowina in römischer Zeit (Sarajevo 1911) 15–18 fig. 8–10. – Cf. F. TEICHNER, „Balkanarchäologie“ – Spiegel der Zeitgeschichte? In: G. v. Bülow (ed.), Kontaktzone Balkan. Beiträge des internationalen Kolloquiums „Die Donau-Balkan-Region als Kontaktzone zwischen Ost-West und Nord-Süd“ vom 16.–18. Mai 2012 in Frankfurt a. M. Koll. Vor u. Frühgesch. 20 (Bonn 2015) 1–32 here 20–24.

<sup>69</sup> N. DUVAL, Mogorjelo: camp ou palais? *Starinar* 40–41, 1989–1990, 253–259; WILKES 1986, 66 fig. 10.

fence. Not only the continuity of location and adaptation of earlier, middle Imperial *castra*, the so-called “*Limeskastelle*”, but also the new founding of highly fortified sites on exposed spurs and plateaus seem to belong to a trans-provincial concept of the late border defence. The described forts show new kinds of buildings that are connected to the changed conditions in the late Roman military and warfare.

In principle, ditches outside the *castra* walls were not a new invention of Diocletian-tetrarchic military architecture, since they had been a permanent feature of Roman fortifications since the Republican marching camps. Like the permanent camps of the Imperial *limes*, they were surrounded by one or two ditches, usually built so closely to the walls that no dead angle existed in which enemies could have hidden<sup>70</sup>. The ditches found at sites like Kellmünz, Zeiselmauer, Pfyn, Stein am Rhein and Halmyris, however, were clearly innovations compared to the earlier ones. The said sites had partial ditches (not enclosing the whole site) with partly monumental measurements. These new ditch systems had a width of up to 15 to 20 m in up to 20 m distance to the walls<sup>71</sup>.

Of similar importance to archaeologists and Roman architects are the different tower shapes. While the latter spared no effort to rebuild and replace the small internal towers of the early and middle Imperial period by larger ones that protruded as far as possible, the archaeologists have tried to use the different types for dating purposes (see the characteristics for special periods). The already mentioned findings in Gamzigrad (*Dacia ripensis*) are pointing in this direction. Here, the older fortification complex of the pre-Galerian period with rectangular towers was replaced a short time later by a palace complex with massive round towers (fig. 5a). Nevertheless, comprehensive overview studies like those by Harald von Petrikovits, Wolfgang Pietsch and Constantin Băjenaru tend to agree that individual tower shapes do not constitu-

te a certain time-bound element of form<sup>72</sup>. The observation that definitely tetrarchic complexes have different tower shapes also points in this direction. The most characteristic element of tetrarchic fortifications are the fan-shaped towers that have been mentioned above for Traismauer, Zwentendorf, Mautern, Zeiselmauer, Ács-Vaspuszta and Passau-Innstadt. This shape can be found solely at the corners of these *castra* and it protrudes far from the actual wall of the fort<sup>73</sup>.

Besides the fan-shaped corner towers, a great number of complexes has intermediate towers of different shapes. The most common ones are simple rectangular and U-shaped towers. While the latter shape is documented from the Severan times onwards, the late-antique examples clearly differ in solidness, size and wall thickness<sup>74</sup>. Wolfgang Pietsch distinguishes two types of U-shaped towers. The towers known from the province of *Valeria* solely seem to jut outwards from the *castra* wall, whereas different complexes in *Noricum ripense* have towers which jut inwards from the *castra* wall<sup>75</sup>.

This catalogue of (known) tetrarchic towers with fan- and U-shaped groundplans has recently been extended by the evidence from Mauer (near Amstetten, AT; fig. 2f), published by Stefan Groh. With 13 preserved and another seven reconstructed towers, this complex not only has a larger variety of tower shapes, but also adds to the outlined repertoire of fortification elements. While the narrow and long sides are protected by rectangular and semicircular towers, the corner towers are large and round, have a diameter of 18 m and sloped inner sides<sup>76</sup>.

In the case of good preservation conditions and careful stratigraphic investigations, the expansion of fortifications during the Diocletian/early tetrarchic period, recorded – as we have indicated at the beginning – by the Greek historian *Zosimus* for the borders of the northwest periphery of the late Roman Empire, the *ripa* of the Danube, can be archaeologically confirmed in the end (fig. 1) – but the picture is not uniform due to the different types of execution. In

<sup>70</sup> A. JOHNSON, *Römische Kastelle des 1. und 2. Jahrhunderts* (Mainz 1987) 59–67; TH. FISCHER, *Die Armee der Caesaren* (Regensburg 2014) 254.

<sup>71</sup> Cf., for example, Pfyn: J. BÜRGI; Teil I: Befunde. In: H. Brem et al. (ed.), *Ad fines. Das spätrömische Kastell Pfyn. Befunde und Funde. Arch. im Thurgau* 8,1 (Thurgau 2008) 15–78 here 55.

<sup>72</sup> PETRIKOVITZ 1971, 199; PIETSCH 2000; BĂJENARU 2010.

<sup>73</sup> LANDER 1984, 246; PIETSCH 2000, 365–368; BĂJENARU 2010, 173.

<sup>74</sup> PIETSCH 2000, 371.

<sup>75</sup> PIETSCH 2000, 376.

<sup>76</sup> GROH 2017, 81.

summary, it should have become evident that we have to expect a multitude of very different architectural developments in fortification buildings from this period. Besides *burgi/praesidia* and *quadriburgia*, gates, towers and ditches (and their types of construction) were typical elements. Improved older complexes stand beside completely newly built ones. From a methodological point of view, especially those cases are the most interesting ones in which inscriptions with identical formulas and shapes verify a coherent building programme (similar to the one on the lower Danube, as described earlier), those in which solid modern stratigraphic investigations lead to detailed dating approaches and, finally, those in which *ex-novo* constructions (e.g. Split and Kellmünz), i.e. the lack of previous buildings, reveal a clear image of the findings. For the future, a systematic concentration on and intensification of the investigation of the key examples of these three options is desirable for an increased and enlightened knowledge of the Diocletian fortification programme between the High Rhine and the Black Sea.

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## Summary

After the upheavals and changes that the Roman Empire faced in the second and third quarter of the 3<sup>rd</sup> century AD, the first Tetrarchy brought a period of peace and prosperity. With the implementation of extensive reforms under the aegis of the Emperor Diocletian, relatively peaceful conditions prevailed along the frontiers of the empire, which made it possible to carry out a programme of reconstruction and strengthening of the Danube Limes. Although literary and epigraphic sources suggest such a building programme, the archaeological evidence of fortifications dating to the time of the Tetrarchy along the Danube and in the eastern and central part of the Late Roman Empire is still tenuous. The present study is an attempt at an overview of the known military establishments along the 3000 km-long “wet frontier” (*ripa*) that stretched from the Upper Rhine to the Black Sea, bordering the provinces of *Maxima Sequanorum*, *Raetia Secunda*, *Noricum Ripense*, *Pannonia Prima* and *Secunda*, *Valeria*, *Moesia Prima* and *Secunda*, *Dacia Ripensis* and *Scythia*, as well as provinces further afield, such as *Dalmatia*, which, because of their location in the hinterland, secured essential lines of supply to the frontier. Beside evident common traits, our overview highlights the establishments' diversity, which may be attributable to regional developments and particularities within an overarching building programme.

In some instances, the existing imperial forts were refurbished or adapted, for example by erecting massive towers flanking the gates and interval towers or digging new surrounding ditches. Downsizing is rarer and probably linked to a reduction in the number of troops. This aspect is counterbalanced by a densification and reorganisation of the frontier posts by constructing new establishments from scratch. These are generally heavily fortified and located near the frontier, on exposed spurs of land and plateaus; inner fortifications were also built in the hinterland, mostly on the plains, as were well-defended imperial residences.

## Zusammenfassung

### **“Fundatori pacis aeternae? – Diokletianische und fröhrtetrarchische Befestigungen zwischen Hoehrhain und Schwarzem Meer**

Nach den Umwalzungen und Veranderungen, mit denen das romische Reich im zweiten und dritten Viertel des 3. Jahrhunderts n. Chr. konfrontiert war, brachte die erste Tetrarchie eine Zeit der Ruhe und des Wohlstandes mit sich. Mit der Durchsetzung umfangreicher Reformen unter der Agide des Kaisers Gaius Aurelius Valerius Diocletianus folgte eine relativ friedliche Zeit an den Grenzen des Reiches, welche die Forderung eines Programmes zum Wiederaufbau und der Starkung des Donaulimes ermoglichte. Wenngleich literarische und ebenso epigrafische Quellen ein solches Bauprogramm vermuten lassen, scheinen tetrarchische Befestigungen entlang der Donau im mittel- und ost-europaischen Raum der spatromischen Kaiserzeit aus archaologischer Sicht noch nicht ausreichend bekannt. Die vorliegende Arbeit versucht daher eine Zusammenschau der bekannten militarischen Anlagen entlang der 3000 km langen “nassen Grenze” (*ripa*), zwischen Hoehrhain und Schwarzem Meer, bzw. in den spatromischen Provinzen *Maxima Sequanorum*, *Raetia Secunda*, *Noricum Ripense*, *Pannonia Prima & Secunda*, *Valeria*, *Moesia Prima & Secunda*, *Dacia Ripensis* und *Scythia*, sowie daruber hinaus entfernterer Provinzen wie etwa *Dalmatia* welche, aufgrund ihrer Lage im Hinterland die wichtigen Versorgungslinien zur Grenze sicherten. Die Zusammenschau zeigt neben augenscheinlichen Gemeinsamkeiten und Charakteristika, vor allem aber auch die Varianz und Vielfalt der Anlagen, welche moglicherweise auf regionale Auspragungen und Besonderheiten eines ubergeordneten Bauprogramms zuruckgefuhrt werden konnen.

Verschiedentlich lasst sich dabei zeigen, dass bestehende kaiserzeitliche Kastelle wiederhergestellt bzw. adaptiert worden sind, letzteres zeigt sich etwa bei der Errichtung neuer, massiver Tor- und Zwischenturme oder Umfassungsraben, bzw. seltener, wohl auf eine Reduktion der Truppenstarke zuruckzufuhrend, verkleinert wurden. Diesem Aspekt gegenuberzustellen ist eine Verdichtung und Reorganisation der Grenzbefestigung durch zahlreiche *ex-novo* Grundungen: in Grenznahe meist durch stark befestigte, auf topografisch exponierten Spornen und Plateaus gelegene Anlagen und im Hinterland, durch in der Ebene gelegenen Binnenfestungen bzw. durch befestigten kaiserlichen Residenzen.