Defining the limes: Roman military presence and the shaping of imperial frontiers during the Principate

Abstract: The considerable expansion of Roman-controlled territory during the Republican period, though reflected in the increased number and strength of the legionary army, apparently proved an insufficient reason to demarcate or specifically delimit the borders, nor to erect frontier fortifications. The situation changed when Augustus established a standing professional army, whose legionaries and auxiliary troops had to be given their own garrisons. However, the way of erecting fortified military bases and other installations along the frontier as well as the defense strategies of particular provinces changed significantly over the following centuries.

Keywords: Roman limes, fortifications, military installations, legionary fortresses, auxiliary forts

INTRODUCTION

The term "limes" usually denotes the frontier of the Roman Empire. The very concept of limes was popularized by Theodor Mommsen, who used it to describe a border road, protected by army troops, together with a system of fortifications (Mommsen 1894; 1993; cf. Oxé 1906; Gebert 1910). A work pivotal for the correct understanding of the term was authored by Benjamin Isaac (1988; cf. Forni 1987; Drijvers 2011; Moreau 2023), who,

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based on epigraphic material and literary sources, analyzed its meaning and use from Republican times to Late Antiquity and proposed three translations: a road, a land border, and a border district. At the same time, Isaac demonstrated that the limes, as an Imperial border in the general sense, should not be understood solely in a military context.[1]

This paper seeks to demonstrate that the form of defenses and the location and strength of garrisons in different regions of the Empire were determined by four basic factors: terrain and hydrology; availability and type of building materials; degree of threat from nearby enemies; and the period of construction and use. Below, evidence of this is presented in the form of examples from different segments of the limes, set in their geographical and historical contexts.[2]

The description of military installations along the Roman limes offered in this paper is not intended as an exhaustive presentation of the various limes areas and organization of provincial armies; rather, it aims to showcase their characteristics and developments in the geographical and historical context of their broader fortification systems.

LIMES ON THE RHINE

Since the conquests of Gaul by Julius Caesar in the mid-1st century BC, the eastern border of the province was on the Rhine (Caes., *Bell. Gall.* 4, 10). In order to protect it from recurrent raids by the Germanic tribes settled across the river, above all the Sicambri and the Suebi, Caesar led two short expeditions to the east bank of the Rhine. Each time, his engineers constructed a bridge and subsequently dismantled it upon return of the troops (Caes., *Bell. Gall.* 4, 6). In the face of the Roman incursions, the barbarians resorted to strategic retreats to prearranged positions deep in their territory to avoid battle. Caesar's aim, apart from pacification, was to impress the enemy and to demonstrate that, despite the absence of a permanent Rhine crossing, the Romans were capable of carrying out rapid retaliatory action on the enemy territory (Caes., *Bell. Gall.* 4, 16; cf. Roman 2007: 68–69). However, this was rather an empty threat; due to the need to maintain order and suppress potential unrest, the core of the legionary force was stationed inside Gaul and likely entrusted provincial border security to Rome's Germanic allies, such as the Ubii (Reddé 2006: 24).

The first permanent frontier garrison —Batavodurum/Nijmegen (I Germanica?)[3]— was established in the reign of Augustus, around 20–19 BC, in the valley of the river Waal, a branch of the Lower Rhine (Franzen 2009) [*Fig. 1*]. Shortly afterwards, around 17–16 BC, the garrison of Novaesium/Neuss (XIX?) was built (Gechter 2007). A subsequent le-

1 Frontiers of the Roman Empire served a multitude of functions; David Breeze (2018: 3–5) provides at least nine examples confirmed in literary and epigraphic sources.

2 Due to their idiosyncrasies, the fortifications securing sea coasts were excluded from the present description. For more on these, see Breeze 2011: 147–158; Dhaeze 2021.

3 Throughout the paper, Roman numerals in brackets refer to the number of the garrisoned legion.

gionary base was likely established near Dangstetten (XIX) on the Upper Rhine (Fingerlin 2006) when the conquest of the Northern Alps began around AD 15. A permanent military presence at Vindonissa/Windisch (XIII Gemina) can also be dated to around the same time (Fellmann 2006). However, the strengthening of the border failed to effectively deter the Germans and possibly even provoked their hostile reaction. In 15 BC, a coalition of the Sicambri, Tencteri, and Usipetes crossed the Rhine and invaded the Roman territory, prompting a battle with the army of Marcus Lollius, the governor of Gaul, that resulted in complete destruction of *legio* V and loss of its standard. The situation was not contained until the arrival of Tiberius, but Augustus evidently understood how great a threat the Germans posed to the province. Soon afterwards, he ordered Drusus to prepare a campaign aimed at defeating the barbarians and conquering the territories east of the Rhine. All the legions previously stationed in the interior of Gaul were then likely moved to the frontier to strengthen the army there and to erect new large garrisons: Vetera I/Xanten (V Alaudae and XXI Rapax); Apud Aram Ubiorum/Köln (I Germanica and XX), the later Colonia Claudia Ara

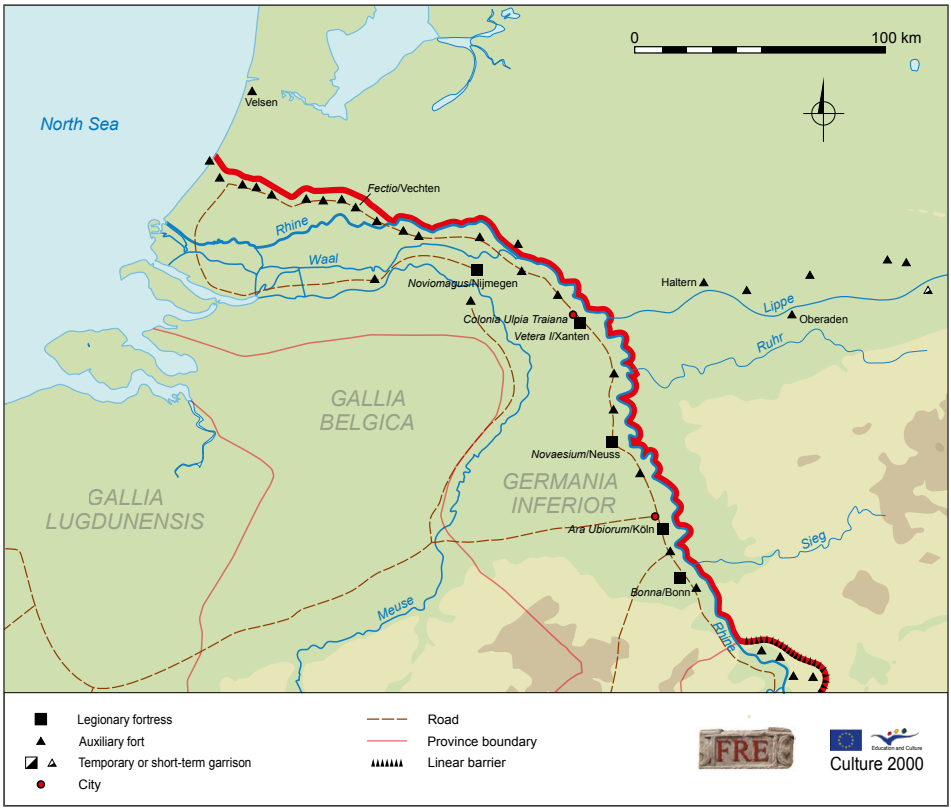

Fig. 1. The Lower Rhine limes (Drawing M. Momot and P. Zakrzewski based on FRE Project maps: https://www.deutsche-limeskommission.de/en/downloads/maps/, accessed: 30.12.2025)

Agrippinensium; and Mogontiacum/Mainz (XIV Gemina and XVI Gallica).[4] The first and last of these were located by the Lippe and Main, two important right-bank tributaries of the Rhine used during campaigns to penetrate the area of northern and central Germania as far as the Elbe.[5] Concurrently, the first forts of auxiliary troops began to emerge between the legionary bases.[6]

Even the unfortunate accident of Drusus, followed by his imminent death in 9 BC, did not hinder the plans for further conquest. Subsequent military successes led Augustus to believe that Germania had finally become another Roman province, to which he soon appointed Publius Quinctilius Varus as administrator. The completion of this undertaking was, however, thwarted later that year by a rebellion in Dalmatia and, above all, the crippling defeat of Varus in Germania, resulting in the loss of legions XVII, XVIII, and XIX, their auxiliaries, as well as their standards. Despite numerous retaliatory expeditions led by Tiberius in AD 10, and the subsequent offensive carried out by Germanicus in AD 14–16,[7] plans to occupy Germania were abandoned and the Rhine again became the border of the Empire (Reddé 2013: 435). Presumably around this time, another legionary base (I Germanica) was established at Bonna/Bonn (Gechter 2001).

The troops stationed on the Rhine, initially grouped in garrisons consisting of two legions, were gradually deployed along the river together with auxiliary units. The newly constructed forts were often built near confluences of smaller rivers with the Rhine. Such locations facilitated the observation and control of waterways and provided convenient sites for harbor construction (Breeze 2011: 94, n. 2).[8] During the reign of Claudius, a very dense network of small wooden forts, each about 1.5 ha in size and located about 7–8 km apart, was established in the Rhine delta.[9] Earlier, the only fort in that area was perhaps Fectio/Vechten (De Groot et al. 2016). For comparison, the distance between garrisons up the Rhine in the 1st century AD was about 20 km, subsequently reduced to 15 km.

4 For Vetera I/Xanten, see Detten 1999. For more on the later-rebuilt nearby fortress of Vetera II/Xanten, see Schmitz 2008. For Apud Aram Ubiorum/Köln, see Bishop 2012: 78–79; for Mogontiacum/Mainz, see Schumacher 2003.

5 During the invasion of Germania, the Roman fleet was used extensively not only on the rivers Rhine, Lippe, and Main. In 12 BC, ships sailed as far as the North Sea to take part in the pacification of the Frisians and Chauci (Konen 2000).

6 David Breeze (2011: 93) suggests that at the time military installations on the Rhine may have been located approximately 40–50 km apart. Examples of these early forts are known from the Netherlands (Thiel and Reuter 2015: 48–56).

7 Plans to occupy Germania may have also been abandoned due to the apparent failure to establish Roman-style urban centers, such as the Waldgrimes site (Schnurbein 2003; Eck 2008). See also Aßkamp 2010 for evidence from Haltern am See.

8 The Rhine fleet (classis Germanica) was an extremely important component of the limes. It enabled constant surveillance of the river and the hostile coast and aided distribution of supplies (Konen 2000). Tacitus' description of the annihilation of a fleet of 24 ships during the revolt of the Batavi suggests that they were deployed at various forts (Tac., Hist. 4, 16).

9 For more on the limes in the Netherlands see Dinter 2013.

From the second half of the 1st century AD, the Upper Rhine was no longer the frontier, as the border shifted further east following the development of defenses on the Upper Germanic-Raetian limes.

The Batavian revolt of AD 69/70 brought the destruction of a number of Roman garrisons along the Lower Rhine. Surprisingly, this caused no major changes to the organization of military installations.[10] Once control of the situation was regained, the rebuilding began. However, in order to more effectively control the Batavian territories, a new, larger fortress was erected at Noviomagus/Nijmegen and manned with the *legio* X Gemina, replaced by IX Hispana in AD 104 (Driessen 2009). Since then, the Rhine limes began to lose its importance in favor of the Danube limes, as is evident from the reduction of troops stationed there and the abandonment of a large number of forts. Functioning as two separate military districts (*exerciti*) from AD 16, Lower and Upper Germania were officially transformed by Domitian, around AD 85, into separate provinces with two legions each. This number was further halved during the reign of Trajan (Reddé 2013: 437).

Despite occasional raids by Germanic tribes,[11] the situation on the Lower Rhine was relatively stable for the next century and a half. The onslaught of the enemy tribes did not lessen over time, and around AD 260 the Romans were forced to abandon their fortifications on the limes between the Lower Rhine and the Meuse.

UPPER GERMANIC-RAETIAN LIMES

The establishment of this part of the limes was directly linked to the creation of the province of Raetia,[12] whose territory, inhabited by Celtic tribes such as the Raeti and the Vindelici, was conquered in 15 BC by Drusus and Tiberius (Suet., *Claud.* 1.2). The first fortified garrisons were established in the 40s of the 1st century AD on the right bank of the Danube, thus marking the northern frontier of the province [*Fig. 2*]. A series of irregularly spaced forts connected by a newly built road stretched from the fort at Oberstimm upstream to the edge of the Black Forest, as far as the Germania Superior frontier located then on the Upper Rhine. The primary function of those military outposts was to secure the border and the

10 One of the consequences was probably the transfer of legions assigned in pairs to a single fortress. However, this was a long process — for example, Domitian's ban on the grouping of two legions was not issued until AD 89, after the rebellion of Saturninus (Suet., Dom. 7.3). Exceptional in this regard was the garrison of the Nicopolis/Alexandria fortress in Egypt, consisting of two legions, which remained unchanged for at least several more decades (Keppie 1984: 194).

11 An example is the Chauci invasion of Lower Germania in AD 160, successfully repelled by Didius Julianus (SHA, Did. Iul. 1).

12 Determining the exact year in which the province was established is still problematic. It probably took place during the reign of Tiberius or Caligula. An inscription dating to the reign of the latter contained the title procurator Augustorum et pro legato provinciai Raitiai et Vindelic (CIL V 3936; see Czysz et al. 1995: 70).

important route of *via* Claudia Augusta, and to monitor both river traffic and the areas further north (Sommer 2015b: 16–17). Their construction was probably due to the general development and stabilization of the province rather than any specific threat, especially as the areas north of the Upper Danube were sparsely populated at the time.

Around the same time, in Germania Superior, the fort at Hofheim was established east of Mogontiacum/Mainz, beyond the Rhine (García-Bellido 2010) as a prelude to further development of the limes in that area (Reddé 2013: 435). Indeed, at the beginning of the Flavian Dynasty, two important campaigns aimed to strategically shift the frontier to the

Fig. 2. The Upper Germanic-Raetian limes (Drawing M. Momot and P. Zakrzewski based on FRE Project maps: https://www.deutsche-limeskommission.de/en/downloads/maps/, accessed: 30.12.2025)

east took control of the fertile area between the Rhine, the Main, and the Danube — the so-called *agri decumates* (Neumann, Timpe, and Nuber 1984). The first campaign focused on seizing the plains along the Wetter, a tributary of the Nidda. Capturing the bridgehead at the foot of the Taunus Mountains secured the region against the Chatti, whom Domitian fought in AD 83–84 (Suet., *Dom.* 6). Meanwhile, a large army assembled at Arae Flaviae/Rottweil (Sommer 2006) advanced into the territory around the Black Forest and the Neckar basin. Simultaneously, the line of fortifications connecting the limes on the Upper Rhine with the Upper Danube was shifted northward, with a new road extending from Argentoratum/Strasbourg (Schnitzler and Kuhnle 2010), a seat of *legio* VIII Augusta since its transfer from Mirebeau around AD 90–92. Soon afterwards, the annexed territories underwent comprehensive colonization, and the process of erecting small observation posts and forts to secure the new frontier, launched under Flavians, was completed and significantly expanded under Trajan (Thiel and Reuter 2015: 82–121).

At the turn of the 1st and 2nd centuries AD, the Romans had already occupied the area north of the Lower Main, the Odenwald, and the Middle Neckar region. In addition, the northern border of Raetia was moved beyond the Danube as far as the Thuringian-Franconian Highlands and the Swabian Jura. The new limes was defined by a frontier road, which facilitated communication and improved the mobility of military units (Tac., *Germ.* 29, 4). The road construction involved cutting down huge swathes of dense forest, which additionally improved visibility.[13] Along

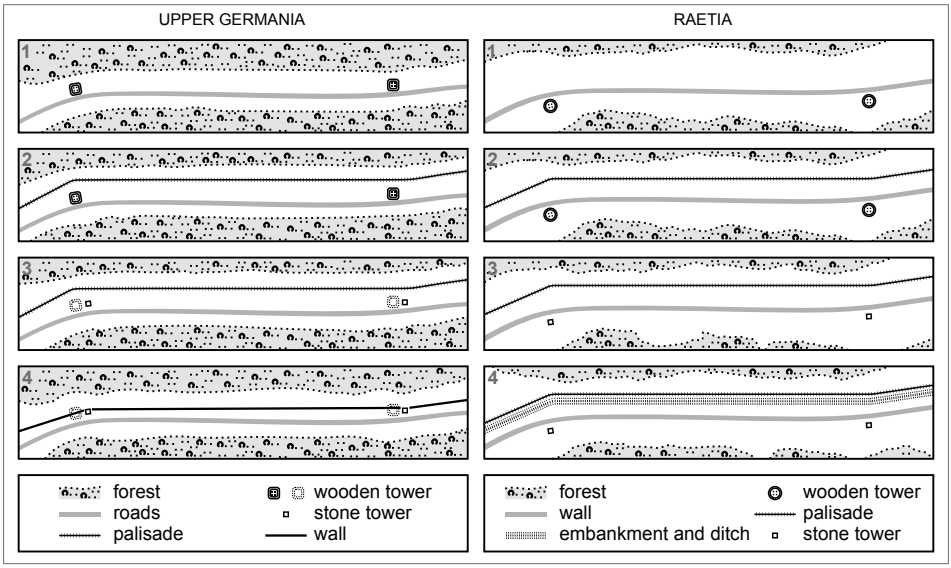

Fig. 3. Development of linear barriers in Upper Germania (left) and Raetia (right) (Drawing M. Momot based on Reddé 2013)

13 This strategy proved successful already during Domitian's campaign against the Chatti (Front., Strat. 1, 3, 10).

its course, watchtowers were successively erected at irregular intervals (200–1000 m apart) and manned with four to five soldiers each. Initially, the watchtowers were built primarily of wood, but later examples, e.g. in the Odenwald section, also featured a stone base. Some towers featured relatively elaborate defensive systems in the form of one or two ditches. Each tower was visible from the nearby fort, which may indicate the existence of a communication system (Woolliscroft 1997; 2001: 115). Over time, fortifications built of perishable materials weathered and deteriorated, and the wooden watchtowers were replaced with stone ones, usually erected nearby. Although the main forces of the legionary army were still stationed in the fortresses on the Rhine at Mogontiacum/Mainz (XXII Primigenia) and Argentoratum/Strasburg (VIII Augusta), many troops were assigned to permanent garrisons on the new limes. Numerous small forts with a capacity of 160 soldiers or less were located directly along the border road and its network of observation towers. Larger gaps between them, such as in the section between the Neckar and the Danube, can be attributed to the absence of large Germanic settlements in the area, which may have resulted in a lower perceived threat. In the following years, as military units were moved closer to the limes, garrisons located in the hinterland were abandoned and new frontier outposts were established.[14] Numerous farms established through successful settlement efforts formed part of a local food provisioning system that undoubtedly played a major role in the expansion of the garrisons (Sommer 2015b: 18–19).

Probably under Hadrian, around AD 120,[15] a palisade was erected on the limes in Upper Germania along the frontier road. It consisted of sawn-off oak stakes placed in an approximately 1 m deep ditch, their flat sides facing the potential attacker. A similar palisade was also erected in Raetia, but the date of its completion, based on dendrochronological analyses, points rather to the reign of Antoninus Pius.[16] However, the first linear barrier in the form of a palisade (the so-called limes Lautertal or Sibyllenspur) on the Upper Germanic-Raetian limes was constructed as early as around AD 100, between the

14 A notable exception was the fort at Friedberg, located considerably far from the frontier, in the center of Wetterau, with one of the largest regiments of 1000 men comprising infantry, cavalry, and archer units (Breeze 2011: 61, 172).

15 Earlier research dating the construction of the palisade in Upper Germania to Hadrian's reign was mainly based on the account of his visit to the region in AD 121, as recorded in the Historia Augusta (SHA, Had. 12, 6). This has been confirmed by dendrochronological analyses of stake fragments from the palisade structure, discovered during the 2002–2003 excavations of watchtower 5/1 near Marköbel. Although the date obtained for the felling of the tree points to the winter of AD 119–120, prior to Hadrian's visit, this does not preclude the possibility that he initiated the project (Schallmayer 2003).

16 The development of linear barriers on the Upper Germanic limes was divided into four phases and placed within an approximate chronological framework by Dietwulf Baatz (2000). For the chronology of the Raetian limes, see Sommer 2011. Many discoveries regarding the course, shape, and operation of the Upper Germanic-Raetian limes were results of long-term investigations initiated in the late 19th century by researchers from the German Reichs-Limeskommission (Fabricius, Hettner, and von Sarwey 1894–1937).

forts Grinario/Köngen and Clarenna/Donnstetten.[17] The purpose of this construction was probably to block the passage between the Neckar and the Danube (Sommer 1999: 177–178; Thiel 2009).

With necessary repairs, renovations, and rebuilding, the limes operated in this form for several more decades. Major changes occurred towards the end of the reign of Antoninus Pius, when the limes moved further east. Although the new linear fortifications were undoubtedly planned in a uniform manner and consisted of the same components, their execution varied between the two provinces [*Fig. 3*]. In Upper Germania, the section of fortifications in Odenwald and its southern continuation were abandoned and replaced with a new palisade, built in the same technique, and with watchtowers and forts located further east in the section between Miltenberg Altstadt and Lorch (Rabold, Schallmayer, and Thiel 2000: 71, 98). A distinctive feature of this section was its construction in a straight line, disregarding the topography. In contrast, the continuation of the fortification line in Raetia, extending to the fort of Abusina/Eining (Fischer 2016), was planned more pragmatically and generally adapted to natural obstacles along its route. The new stone watchtowers were positioned at shorter intervals (300–800 m) to maintain visibility between them. Their dimensions ranged from 4 m² to 8 m², with some situated near gaps in the palisade (Sommer 2015a; cf. Symonds 2018: 171–172). The redeployment of the limes line entailed the location of frontier garrisons. Why these undoubtedly costly changes were introduced remains unclear. It is possible that the goal was to expand the territory to gain additional cultivable land. This considerable modification of the limes coincides with a rising threat from the Chatti. Their increasingly frequent raids, which peaked during the reign of Marcus Aurelius and Lucius Verus (SHA, *Marc. Aur.* 8), may have influenced the decision to erect additional fortifications.

By the end of the 2nd century AD, the wooden palisade no longer met the requirements of a reliable fortification and was replaced along its entire length by other defensive structures. In Upper Germania, a defensive ditch was dug behind the existing line of fortifications, and an earth embankment was raised.[18] a stone wall, about 1–2 m wide and extending an impressive 167 km, was built in Raetia and integrated with towers positioned along the limes. The protection of the province was also bolstered with a new contingent of troops of the *legio* III Italica stationed at Castra Regina/Regensburg from AD 179 (Aumüller 2013). The construction of more permanent fortifications may have been driven by the increasing threat from barbarian tribes, primarily the Alemanni, whose attacks intensified from the early 3rd century AD. These assaults repeatedly breached the defensive line by the mid-century, prompting the gradual

17 For more on Grinario/Köngen, see Unz 1982; for more on Clarenna/Donnstetten, see Heiligmann 2005.

18 The exceptions were a few sections located in the Taunus, where, probably due to the presence of a solid bedrock, a stone wall was constructed instead of a ditch and a rampart. No linear fortifications, however, were noted in the marshy areas.

Roman withdrawal from the Upper Germanic limes around AD 260, culminating in their final retreat behind the Rhine and Danube.

MIDDLE AND LOWER DANUBIAN LIMES

Stretching west to east across Europe for some 2850 km, the Danube, with its extensive network of tributaries, served as an excellent waterway for the Romans, primarily facilitating supply distribution.[19] However, due to various factors, including the river's tendency to freeze, it was not considered a sufficient protective barrier against external invasions. Nonetheless, several strategic considerations likely influenced the decision to establish and later expand the limes along its course.[20] The Middle [*Figs 4* and *5*] and Lower Danube [see below, *Fig. 7*] formed the northern border of the provinces of Noricum, Pannonia, and Moesia, regions originally inhabited by numerous tribes, including Celts, Illyrians, Thracians, and Geto-Dacians. This cultural mosaic was further enriched by the presence of Greek colonies along the Black Sea coast.

The Balkans came under the Roman influence as early as the 1st century BC, but it was not until the reign of the Julio-Claudian Dynasty that measures were taken to eventually bring the region under effective control [*Fig. 6*]. Among the first were the annexation of the allied

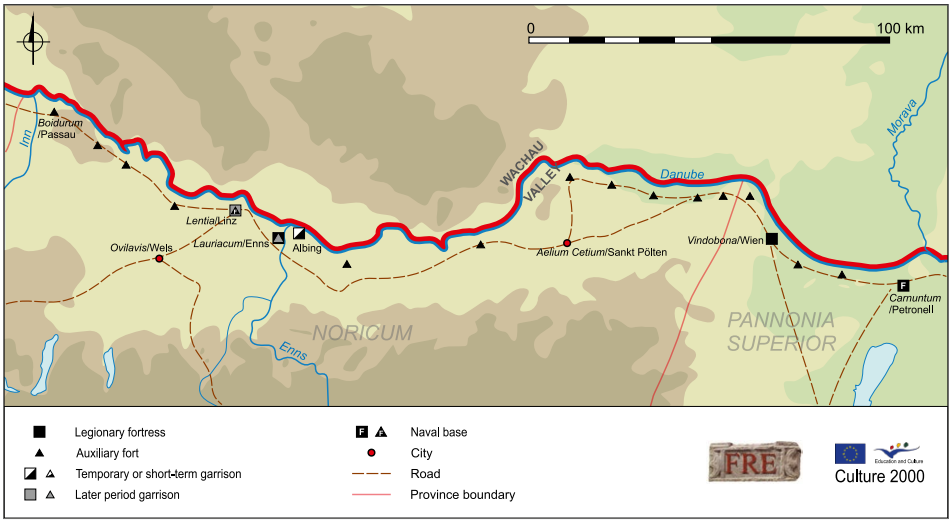

Fig. 4. The Middle Danube limes – Noricum and Pannonia Superior (Drawing M. Momot and P. Zakrzewski based on FRE Project maps: https://www.deutsche-limeskommission.de/en/downloads/maps/, accessed: 30.12.2025)

19 Ravines and cataracts, particularly around the Iron Gates, prevented the river from being fully navigable, but this problem was partly resolved by Trajan. See below.

20 The main one was, undoubtedly, the difference in elevation: the right bank was relatively higher than the opposite side, which was mostly flat and open.

Fig. 5. The Middle Danube limes — Pannonia Superior and Inferior (Drawing M. Momot and P. Zakrzewski based on FRE Project maps: https://www.deutsche-limeskommission.de/en/downloads/maps/, accessed: 30.12.2025)

kingdom of Noricum around 15 BC, the conquest of the Sava and Drava river valleys between 14 and 9 BC, and securing the Illyricum province, which was divided into Dalmatia and Pannonia after the suppression of *Bellum Batonianum* between AD 6 and 9 (Šašel Kos 2013).[21] At this time, a large concentration of the army was located in Siscia/Sisak, while other units were deployed deep into the subjugated territories. These measures not only facilitated the establishment of a border along the Middle Danube but also, crucially, secured the *via militaris* — the main communication route linking Italy to Asia Minor via the Balkans. A key junction along this route was Naissos/Niš, where several roads converged, including those from Lissus/Lezhë, Serdica/Sofia, Singidunum/Beograd, and Scupi/Skopje, making it a strategic starting point for expansion toward the Lower Danube (Syme 1999: 205–206).

The conquest of Moesia and Thrace took place in several stages. Among the most significant was the campaign against the Bastarnae in 27 BC, launched by the governor of Macedonia, Marcus Licinius Crassus (grandson of the triumvir of the same name). After securing a victory at Serdica, he advanced eastward, engaging in a series of arduous campaigns that lasted until 27 BC. His ultimate success earned him a triumph in Rome (Flor., *Ep.* 2, 265, 13–16; Dio., *Hist. Rom.* 51, 23–27; see Syme 1939: 303; 1999: 308). The conquest continued with Cornelius Lentulus' repulsion of the Dacians, Sarmatians, and Getae in 9–6 BC (Syme 1934; Sarnowski 1988: 16), followed by campaigns against the Dacians led by Aelius Catus. Catus was also responsible for the trans-Danubian resettlement of some 50,000 Getae to Moesia (Strab., *Geog.* 8, 3, 10; cf. Mrozewicz 2013: 431–433). However, the establishment of the frontiers of the Moesia province,

Fig. 6. The Balkans with the Middle and Lower Danube limes around AD 50 (Drawing M. Momot and P. Zakrzewski based on FRE Project maps: https://www.deutsche-limeskommission.de/en/downloads/maps/, accessed: 30.12.2025)

21 For the division of Illyricum, see Kovács 2008b.

the exact time of which is still debated, occurred later, in the middle of the 1st century AD.[22]

Until then, most of the army —seven legions in total— stationed in the Balkans were still deployed in the prov-

Fig. 7. The Lower Danube limes after the conquest of Dacia (Drawing M. Momot and P. Zakrzewski based on FRE Project maps: https://www.deutsche-limeskommission.de/en/downloads/maps/, accessed: 30.12.2025)

22 Established in AD 15, according to Tacitus, the province of Moesia initially included the territory between the rivers Sava and Iskar, where the legionary fortress of Oescus/Gigen was located. The land further east was added only after the annexation of the allied Kingdom of Thrace by decree of Claudius in AD 46. Even later, probably during the reign of the Flavian Dynasty or only under Trajan, the area of Dobruja in the Danube delta was added to the province (Matei-Popescu 2022).

inces, at Burnum/Kistanje (XI Claudia), Tilurium/Gardun (VII Claudia), Poetovio/Ptuj (VIII Augusta), Siscia/Sisak (IX Hispana), Emona/Ljubljana (XV Apollinaris), and Scupi/Skopje or Naissos/Niš (IV Scythica).[23] Similarly, most auxiliary units were garrisoned in, e.g., Salla/Zalalövő, Timacum Minus/Ravna, and Montana.[24] Only *legio* V Macedonica had a garrison on the Danube at Oescus/Gigen (Boyanov 2008), likely established already during the reign of Augustus. The deployment of the other legions to the Danube occurred during the reign of Claudius. First, in Pannonia, *legio* XV Apollinaris was stationed at a new base at Carnuntum/Petronell (Gugl and Kastler 2007), an important point on the amber route. Then, in Moesia, *legio* VIII Augusta established a legionary fortress at Novae/Svishtov (Sarnowski 1981: 43–44; 1988: 27; Genčeva 2002: 11–12; *contra* Lemke 2018). Over time, garrisons of auxiliary troops were also established along the Danube limes. The known forts included Boidurum/Passau (Aign 1975), Lentia/Linz (Ruprechtsberger 1997b), Lauriacum/Enns (Fischer 2002: 34–40), Arrabona/Győr (Mráv 2013: 76–78), Brigetio/Szőny (Mráv 2013: 79–82), Solva/Esztergom (Lőrincz 2001: 40–41), Lussonium/Dunakömlőd (Visy 1991), and Lugio/Dunaszekcső (Karavas 2001: 35), as well as auxiliary cavalry forts at Variana/Leskovec (Karavas 2001: 136), Utus/Giljanc (Gudea 2005: 416–417), and Augustae/Harlec (Breeze 2011: 100–101; Sarnowski 2013: 281–282; for the fort, see Ivanov 2003). Additional security was provided by two fleets —*classis* Pannonica and Moesica— likely established by Tiberius. They patrolled the middle and lower reaches of the Danube, with bases at Taurunum/Zemum (Karavas 2001: 44) and Noviodunum/Isaccea (Baumann 2008), respectively. Another base of the Moesian fleet at that time was located at Sexaginta Prista/Ruse (Wilkes 2005: 149–150; for the fort, see Torbatov 2012). The deployment of troops along the Danube was likely prompted by the need to defend the borders against the numerous barbarian tribes settled on the other side of the river. The main threat came from the Marcomanni and Quadi, as well as nomadic Sarmatian tribes —the Iazyges and Roxolani— whose territories were separated by the no less dangerous and much better-organized Dacians settled around Transylvania. The Romans repeatedly attempted, with varying success, to exploit the complicated relations between these tribes, which frequently erupted into open conflicts.[25]

23 For Burnum/Kistanje, see Campedelli 2011; for Tilurium/Gardun: Sanader 2006; for Poetovio/Ptuj: Vomer Gojkovič 2009; for Siscia/Sisak: Radman-Livaja 2010; for Emona/Ljubljana: Šašel Kos 1995.

24 For Salla/Zalalövő, see: Gabler 2006: 89–90; for Timacum Minus/Ravna: Petrović and Filipović 2013; for Montana: Ivanov and Luka 2015: 200–206.

25 A good example of their direct involvement in the internal affairs of their neighbors across the Danube is the interference in AD 19 in the election of the Quadi ruler Vannius, who was favorably disposed to Rome, or the intervention of the legate of Moesia, Plautius Silvanus, in AD 61–66 during the conflict between the Dacians, Bastarnae, Roxolani, and an unknown enemy (Tac., Ann. 2, 63; Sarnowski 2006b).

The widespread turmoil caused by the civil war in AD 68–69, and the earlier weakening of the Moesian army's contingent due to the abandonment of the Oescus/Gigen fortress by *legio* V Macedonica, which had been transferred east to fight against the Parthians, led to bold barbarian incursions into the Roman territory along the Lower Danube (Tac. *Hist.* 1, 79, 1–5). During one of these raids in AD 70, a legion was completely destroyed, and the governor of Moesia, Fonteius Agrippa, was killed (Tac., *Hist.* 3, 46; cf. Wheeler 2011: 205–207; Paunov and Doncheva 2013). In response to such a direct threat, Vespasian began reinforcing the limes on the Danube (Ios. Flav., *Bell. Jud.* 7, 89–95). On his orders, Roman troops took full control of the area east of the Yantra River up to Dobruja, and the eastern part of the Lower Danube limes was secured with newly constructed forts and a reorganized fleet — *classis* Flavia Moesica.[26]

These measures proved insufficient to prevent a conflict with the powerful Dacian Kingdom, which invaded Moesia in AD 85–86. The ensuing war along the Lower Danube, waged by Domitian (see Stefan 2005: 399–421), who in the meantime (and in the following years) had to contend with problems in other provinces —including the precarious situation on the northern border of Noricum and Pannonia— ended with a peace treaty unfavorable to the Romans.[27] This conflict led to profound changes in the organization of the Danube limes, a development that increasingly engaged the attention of successive emperors.

In the Flavian period, major changes included the division of Moesia into Moesia Superior and Inferior in AD 86, the redeployment of the remaining troops along the limes, and their reinforcement with new units from outside the Danubian provinces. The number of legions stationed in Pannonia was increased to four with bases at Vindobona/Wien (XIII Gemina), Carnuntum/Petronell (XV Apollinaris), Brigetio/Szőny (I Adiutrix), and Aquincum/Budapest (II Adiutrix).[28] Changes also occurred in the two Moesian provinces, where legions were garrisoned at Viminacium/Kostolac (Golubović, Korać, and Mrđić 2018), housing the VII Claudia and IV Flavia,[29] Oescus/Gigen (V Macedonica), and Novae/Svishtov (I Italica) (Wilkes 2005: 151–152). At this time, there was a general increase in the number of auxiliary troops, whose forts were distributed along the limes. Akin to the large legionary fortresses, the smaller garrisons were built around

26 This newly manned section of the Lower Danube limes apparently consisted initially only of auxiliary troops (Sarnowski 1988: 41–47; 2006b: 89cf. Strobel 1989: 1–23). Auxiliary troops in Moesia: Matei-Popescu 2001–2002; 2010: 167–244; Matei-Popescu and Țentea 2018.

27 On the peace conditions and the issue of propaganda against Domitian's merits, see Lica 2000: 192–193; Stefan 2005: 425–436; Strobel 2006: 106–107.

28 For Vindobona/Wien, see Moser 2002; for Aquincum/Budapest, see Németh 1995.

29 The main base of the legion, after its transfer from Dalmatia, used to be linked with Ratiaria/Archar (Mirković 1968: 28–29, cf. Karavas 2001: 100, n. 449). It is more likely, however, that IV Flavia was stationed for some time in Viminacium/Kostolac, together with VII Claudia, after its arrival in Moesia, probably until Trajan's campaigns against the Dacians (Breeze 2011: 103; Sarnowski 2013: 282).

the right-bank tributaries of the Danube, opposite islands on the river, and generally at crossings.[30] Typical for this period was the clear correlation between the location of forts and the degree of threat in specific sections of the limes. The terrain became a key factor in selecting convenient locations for forts on both the south and north banks of the river.[31] Landforms and landscape features, such as bodies of water and forests, played an increasingly important role, on one hand improving the defensive capabilities of the Romans and, on the other, impeding the concentration of enemy troops for potential large-scale assaults.[32] It is likely that the Danube limes was also protected by watchtowers, a few remnants of which survive at several frontier locations (Jeremić 2007; Visy 2008: 65–66). The scale and innovative character of these construction projects demonstrate that, from this point onward, the limes on the Middle and Lower Danube held a special status within the broader frontier defensive system of the Empire.

After Trajan's conquest of Dacia following two victorious campaigns in AD 101–102 and 105–106, involving nearly half of the total strength of the Roman legionary army at the time, the limes on the Danube was reorganized once more (Wilkes 2000: 104).[33] Major construction works prior to the first campaign included digging a navigable channel near the Iron Gate gorge to enable communication between the middle and lower reaches of the river (Munteanu 2011: 164–169). The first permanent bridge over the Lower Danube was erected between Pontes/Kostol and Drobeta/Turnu Severin — a remarkable engineering achievement by Apollodoros of Damascus.[34] Extending far beyond the previous frontier, the new province of Dacia, created in AD 106, included Banat, Transylvania, and western Wallachia (Oltenia), while the other conquered territories —eastern Wallachia (Muntenia)[35] and southern Moldavia— were incorporated into Lower Moesia (Zahariade 1977: 387–388), which also received new garrisons. They were located

30 The narrowing sections of the riverbed were deemed the most convenient locations for fortifications on the Danube and river limes (ripae), as they enabled the monitoring of river traffic (Sommer 2009: 111–112).

31 An example of this was the Noricum limes, where the opposite bank of the Danube was characterized by sparsely populated and densely forested areas that did not require the presence of many garrisons. An exception to this was the area to the east of the Wachau Valley, which featured open, cultivable plains that could be easily penetrated by, for example, the Marcomanni. Apparently for this reason, five forts housing very strong garrisons, including mounted troops, were erected in this short stretch of about 50 km (Breeze 2011: 104; Sarnowski 2013: 283; also Sommer 2009).

32 A case in point is the Danube delta, where extensive marshlands mitigated external threats, allowing the contingent of troops to be limited, with the fleet providing primary protection (Karavas 2001: 191).

33 For Trajan's campaigns, see Strobel 1984; 2010: 236–289; Stefan 2005: 503–623.

34 For more on this achievement, see Serban 2009. For Pontes/Kostol, see Gudea 2001: 79–80; for Drobeta/Turnu Severin, see Gudea 2001: 81–85.

35 These territories, along with the newly built forts, were abandoned on Hadrian's orders (Zahariade and Lichiardopol 2009; Țentea and Matei-Popescu 2015).

east of Novae, in the legionary fortresses at Durostorum/Silistra (XI Claudia) and Troesmis/Iglita (V Macedonica),[36] and in auxiliary unit forts at Carsium/Hârșova, Sacidava/Dunăreni, Capidava/Capidava, Arrubium/Măcin, Dinogetia?/Garvăn, and Halmyris/Murighiol.[37]

Meanwhile, Upper Moesia ceased to be a frontier province, leading to a reduction in military presence, except for strategically maintained legions at Singidunum/Beograd (IV Flavia Felix) and Viminacium/Kostolac (VII Claudia), as well as auxiliary forts at Novae/Čezava, Diana/Karata, and Pontes/Kostol, among others.[38] By this time, Pannonia had been reorganized into two provinces,[39] with legionary bases in Pannonia Superior at Vindobona/Wien (XIV Gemina), Carnuntum/Petronell (XV Apollinaris), and Brigetio/Szőny (XXX Ulpia), and in Pannonia Inferior at Aquincum/Budapest (X Gemina). A key development in defensive structures during this period was the rebuilding of fortifications of many Roman garrisons on the Danube in stone.

Peace on the Danube was short-lived — in AD 107, the Iazyges invaded Dacia and Lower Pannonia (SHA, *Had.* 3, 9). Although the Roman army swiftly repelled the attack, the barbarian threat persisted. In AD 117, while Trajan campaigned in the Near East, a much larger incursion struck the Roman Lower Danubian territories. First the Iazyges and then the Roxolani, who had been paid allies of Rome since the Dacian wars, attacked Dacia on two fronts. Lower Moesia was also invaded, with the so-called Free Dacians from beyond the province joining the conflict.[40] To counter the threat, Hadrian dispatched Marcius Turbo to take command of the armies in both Dacia and Lower Pannonia (SHA, *Had.* 6, 6–7). Order was restored in AD 119, but at a cost — the Romans abandoned a considerable portion of Wallachia, shifting the border to the Olt River. To prevent future invasions from the north, Hadrian also ordered the dismantling of the bridge over the Danube (Dio., *Hist. Rom.* 68, 13, 6). This was followed by the division of Dacia: first, in AD 120, into two provinces, Dacia Superior and Inferior,[41] and soon after, the

36 The exact date at which those legions relocated and erected new bases on the Danube remains debatable (Sarnowski 1988: 61; cf. Alexandrescu and Gugl 2015: 251 and n. 3).

37 For more on these garrisons, see the following: on Durostorum/Silistra: Donevski 2009; Troesmis/Iglita: Alexandrescu and Gugl 2015; Carsium/Hârșova: Nicolae, Bănoiu, and Nicolae 2008; Sacidava/Dunăreni: Gudea 2005: 443–445; Capidava/Capidava: Gudea 2005: 448; Arrubium/Măcin: Gudea 2005: 453; Dinogetia?/Garvăn: Gudea 2005: 455; Halmyris/Murighiol: Suceveanu et al. 2003: 27–42.

38 For Singidunum/Beograd, see Bojović 1996; for Novae/Čezava, see Gudea 2001: 62–64; for Diana/Karata, see Gudea 2001: 75–78.

39 The province was divided in AD 106–107 at the latest, as indicated by an inscription mentioning Hadrian as governor of Lower Pannonia (CIL II 550; cf. Mócsy 1974: 92).

40 The aggressive response of the nomadic tribes is understandable as the new province created a barrier that restricted their movement between regions west and east of Dacia. It also reduced their grazing lands, such as those in Dobruja, which were crucial for winter pastures. Additionally, the Roxolani opposed the reduction of their subsidies (SHA, Had. 6, 8; cf. Mócsy 1974: 100; Poulter 1990: 147; Bârcă 2013: 118–119).

41 Since AD 168, successively Dacia Apulensis and Malvensis.

northwestern part of Upper Dacia became Dacia Porolissensis.

The nearly half-century-long peace was disrupted in AD 167, when barbarian tribes from the north broke their agreement with Rome and attacked Roman territories in Pannonia and Noricum. Over the following years, multiple sections of the Middle Danubian limes were repeatedly overrun, causing destruction both along the frontier and within the provinces. The ensuing struggles, known collectively as the Marcomannic Wars, lasted until AD 180. The threat was so severe that it demanded the direct attention of Emperor Marcus Aurelius, who spent the last years of his life addressing the crisis. The fighting also extended to the Lower Danubian provinces, as the Costoboci launched an invasion into Lower Moesia. To reinforce security along the Upper and Middle Danubian limes, two new legions were raised and stationed at Castra Regina/Regensburg (III Italica) and Lauriacum/Enns (II Italica).[42] As part of the peace agreement with the barbarians, their access to the areas directly along the Danube was restricted. To establish tighter control over hostile territory, small military installations, including watchtowers and minor forts, were constructed on the north bank of the Danube (Visy 2008: 65–66; 2009b: 991–994; Sarnowski 2013: 286–287; also Kovács 2008a; Cociș 2016–2017).

In the 3rd century AD, during the crisis that struck the Empire between AD 230 and 260, the Danube limes faced devastating invasions (Varbanov 2012) occurring with greater frequency and now increasingly led by the Goths. Numerous counter-offensives were organized against them, but the most disastrous was the campaign led by Emperor Trajan Decius, which ended with his death and the defeat of Roman forces at the Battle of Abritus/Razgrad in AD 251. Although a subsequent victory by Claudius II at Naissus/Niš in AD 268 helped secure the provinces south of the Danube, Dacia's fate seemed sealed. Around AD 271, the province was evacuated by Aurelian's order (Sarnowski 1988: 121; cf. Hügel 2003; de Blois 2017: 52), and the legions formerly stationed there were moved south of the Danube to new bases at Ratiaria/Archar (*legio* XIII Gemina; see Dinchev 2002) and Oescus/Gigen (*legio* V Macedonica), both within the newly formed province of Dacia Ripensis.

DACIAN LIMES

While the sections of the limes discussed so far largely followed rivers, the fortifications on the frontiers of Dacia —their type, shape, and the location of the garrisons— were adapted to its predominantly mountainous terrain, which offered a significant strategic advantage [*Fig. 7*]. The provincial border ran along the Danube in the west, through the Tisza and Mureș river valleys, continued through the Someș valley and the eastern end of the Pannonian Basin, and reached the foot of the

42 Even before the establishment of the fortress at Lauriacum/Enns, the Second Italic Legion had been stationed at Albing since AD 173 (Gugl 2015). For Lauriacum/Enns, see Winkler 2003.

Eastern Carpathians.[43] From there, it followed the mountains southeastwards to meet the Danube along a route parallel to the Olt. The choice of this territory, corresponding with the Dacian Kingdom, was motivated by the desire to exploit the natural advantages of the Carpathian Mountains, which not only served as a clear border but also as an effective natural barrier. Indeed, in both shape and extent relative to the Danube border, Dacia acted as a stronghold, with an additional inner ring of fortifications surrounding the quasi-citadel of Transylvania. The most conventional entry routes along river valleys were guarded by auxiliary troops stationed in forts and numerous watchtowers. Garrisons were also placed inside the province, along key roads. This concentric deployment, while unusual, seems logical given the area's orography. Another distinctive feature of Dacia's defense system was that it was developed relatively late, at a time when the experiences gained from operating the limes in other parts of the Empire in the 1st century AD enabled the application of a well-established border protection strategy.

The first Roman fortifications in Dacia were built during Trajan's two campaigns, the so-called Dacian Wars.[44] Their location generally aligned with the route of the armies' march and the extent of the areas conquered (Lăzărescu and Opreanu 2016: 56–60). During the first expedition in AD 101, likely following the later road from Lederata/Ram to Aisis/Fârliug (*Tab. Peut.* 7, 2–4),[45] a legionary fortress was established at Bersobis/Berzovia (Protase 1967; Nemeth et al. 2011: 46–49) with a garrison of *legio* IV Flavia Felix, as well as forts Centum Putea/Surducu Mare (Nemeth et al. 2011: 45–46), Pojejena (Jęczmienowski, Pisz, and Timoc 2023), Arcidava/Vărădia (Nemeth et al. 2011: 41–45), and Tibiscum/Jupa (Pisz, Tomas, and Hegyi 2020). Perhaps already then, or shortly after, forts were also established in the Wallachian area, including at Târgşor, Mălăieşti, Pietroasele, and Drajna de Sus (Ţentea and Matei-Popescu 2015: 112–115).[46] During the second expedition in AD 105, the area north of the Mureş, where the Micia/Veţel fort (Gudea 1997: 37–39) was built, was conquered. Over time, several forts were constructed there, forming a circuit around the largest one, Porolissum/Moigrad, which was further protected by a linear barrier in the form of an earth embankment, about 4 km long, to the east of the garrison.[47] Similar structures

43 For a long time the eastern border of Dacia was assumed to have followed the outer ranges of the Carpathian Mountains, while the other borders are still widely disputed. This is also due to the fact that the determination of its territorial extent is based on the location of forts and watchtowers, obviously not all of which have been localized (Visy 2009a; cf. C. Szabó 2014).

44 The way the Romans understood it, there was only one Bellum Dacicum and two campaigns — expeditiones dacicae (Rosenberger 1992: 92–94).

45 For Lederata/Ram, see Ivanišević and Bugarski 2015; for Aisis/Fârliug, see Nemeth et al. 2011: 49.

46 The date of construction, administrative status and, above all, function of these garrisons, which lasted no longer than 17 years, are still contended. A recent theory links their presence to the salt trade (Ţentea and Matei-Popescu 2015: 121–124).

47 On Porolissum/Moigrad, see Opreanu and Lăzărescu 2015. On the strategic importance of Porolissum and the network of forts in northwest Dacia, see Opreanu et al. 2014. On the linear fortifications around Porolissum, see Cociş 2016.

were erected across several passes as a form of blockade. Closer to the outer perimeter, the fortified garrisons consisted of infantry troops, while those deeper inside the territory were composed of mounted units. Their role was to stop attackers and prevent them from entering the province. On the opposite side, at the foot of the Eastern Carpathians, a long line of forts stretched towards the Olt River and along its bank (M. Szabó 2009). The southwestern part of the provincial limes was much less fortified, possibly due to the marshlands extending eastwards from the Tisza and its many tributaries (cf. Visy 2009a; Nemeth 2014).

Immediately after the conquest of Dacia, three legions were stationed in the province: XIII Gemina and I Adiutrix at Apulum/Alba Iulia (C. Szabó 2015), and IV Flavia at Bersobis/Berzovia. Following the crisis of AD 117–118, many garrisons that had suffered during the heavy fighting were rebuilt. Although the legionary contingent was reduced to just *legio* XIII Gemina, many forts were reinforced with auxiliary units, including cavalry, whose scarcity had been felt acutely during the recent conflict. After the abandonment of much of the Wallachian plain, the southeastern border of the province was established east of the Olt, along the western bank of which a network of forts was erected at intervals of 35–40 km, connected by a road running from Lower Moesia. An additional security measure against potential attacks was the so-called limes Transalutanus, located about 30–40 km east of the river. The linear barrier, made of earth, had two phases of construction. The first rampart, probably built of timber in a box-type construction, was later enlarged in both width and height during renovations. The small forts and watchtowers connected by the limes road were built along the line of fortifications.[48] The last noteworthy change in the manning of Dacia was the arrival of the V Macedonian legion and the construction of a new fortress at Potaissa/Turda in AD 168 (Fodorean 2011).

LIMES IN BRITANNIA

The Roman interest in conquering Britannia was first expressed by Julius Caesar, who carried out two expeditions to the island in 55 and 54 BC (Caes., *Bell. Gal.* 4, 20–36; 5, 8–23). Both of these expeditions had no immediate consequence other than, perhaps, increasing the myth with which he was already surrounded.[49] The idea of conquering Britain continued to excite Romans during the Augustan era,[50] but the attention of the emperor and his successor was focused elsewhere.

48 This structure is assumed to have been built during Hadrian's reign, as indicated by the (unreliable) dating of the small garrisons found along its line. Associating linear barriers with this emperor is fairly common (Teodor 2015; Teodor and Ștefan 2014).

49 During his second expedition, Caesar reached the Thames, subjugating several tribes who pledged to pay tribute to Rome. However, on his return to the continent these pledges were never fulfilled (Strab., *Geog.* 115–116). Tacitus (*Agr.* 13) notes that although Caesar's plans to conquer Britain were abandoned in favor of Germania, this expedition paved the way for future conquest.

50 Numerous references by poets to the conquest of the Britons are known from the reign of Augustus (Griffin 1984).

Fig. 8. The province of Britannia (Drawing M. Momot and P. Zakrzewski based on FRE Project maps: https://www.deutsche-limeskommission.de/en/downloads/maps/, accessed: 30.12.2025)

Significantly, the Britonic tribes known to the Romans at the time were officially recognized as subordinate allies. Plans, and perhaps even preparations, for an invasion of the island were made by Caligula in AD 40,[51] but the expedition never took place. The young ruler, probably no longer in touch with reality at the time, claimed otherwise (Dio., *Hist. Rom.* 59, 25; Suet., *Cal.* 45–47). The actual invasion of Britain was launched three years later by Claudius, who was motivated, at least in part, by his intention to claim the title of conqueror. The well-planned venture was led by Aulus Plautius, with probably four legions at his disposal: II Augusta, IX Hispana, XIV Gemina, and XX Valeria Victrix, as well as a number of auxiliary units, including those composed of Batavians and Thracians (Todd 2004: 45). During the first stage of the conquest, he defeated the Catuvellauni and occupied their territory, including its capital, Camulodunum/Colchester (Gascoyne and Radford 2013). In the vicinity of the capital, the first legionary fortress was briefly established, after which the entire southeast part of the island was conquered. As governor of the new province, Britannia [*Fig. 8*], Aulus Plautius successively subjugated other barbarian kingdoms and organized the defense of the occupied territories by creating a network of forts, mainly around the Trent and Severn river basins, and in southwest England, near the base of *legio* II Augusta at Isca/Exeter (Bidwell 1980). At the end of AD 47, the new governor, Publius Ostorius Scapula, invaded Wales. The conquest of this region proved more troublesome than anticipated (Manning 2004), not least because of numerous rebellions across other parts of Britain, culminating in the Boudican revolt of AD 60–61.

Further advances in Roman territorial expansion on the island occurred under Vespasian (Tac., *Agr.* 17, 1), who had personally participated in the initial conquests as legate of *legio* II Augusta. At the time, the legions were stationed in four fortresses: Eboracum/York (IX Hispana), Isca Augusta/Caerleon (II Augusta), Deva/Chester (II Adiutrix replaced after AD 89 by XX Valeria Victrix), and Lindum/Lincoln (IX Hispana, replaced after AD 70 by II Adiutrix).[52] Among the governors of this period, the most notable was Julius Agricola (AD 77–84), who completed the conquest of Wales and, through numerous campaigns, extended Roman power as far north as Caledonia (Hanson 1987). To secure the new territories, he ordered the construction of forts and the fortress of Inchtuthil to be garrisoned by the 20th Legion (Pitts and St Joseph 1985; Shirley 2001; Montesanti 2009). Although full control of the island seemed within reach, events on the Danube and other circumstances forced the Romans to reorganize their army in Britain and withdraw southward beyond the Solway Firth–Tyne Valley line. The existing network of forts between Coria/Corbridge (Breeze 2006: 416–427) and Luguvalium/Carlisle (McCarthy 2002), linked by the Stonegate road, was

51 Recent discoveries made at fort Flevum?/Velsen seem to confirm this to some extent.

52 For Eboracum/York, see Macnab 2000; for Isca Augusta/Caerleon, see Boon 1987; Gardner and Guest 2008; for Deva/Chester, see Carrington 2002; for Lindum/Lincoln, see Jones 1988.

expanded. By around AD 105, much of the army had already been evacuated from the north (Bidwell 1999: 11–14).

With the northern limes reinforced, the average distance between fortified garrisons was about 11 km. The wider gap (about 24 km) between Vindolanda/Chesterholm (Birley 2009) and Brampton (Breeze 2006: 455–456) was supplemented by at least three smaller forts and four watchtowers (Breeze 2011: 63). Further north of these fortifications, Hadrian ordered the construction of the famous barrier that now bears his name [*Fig. 9*].[53]

Hadrian's Wall stretched approximately 118 km from Maia/Bowness on Solway Bay to Segedunum/Wallsend, 7 km from the mouth of the River Tyne.[54] Its course generally followed the terrain to maximize natural defenses, as seen at the Whin Sill section near Crag Lough, where the wall runs close to an escarpment. Notably, most of the fortifications were routed along the south slopes of hill ridges rather than their summits.[55] Building such a vast structure likely involved all legions stationed in Britain at the time: II Augusta, XX Valeria Victrix,

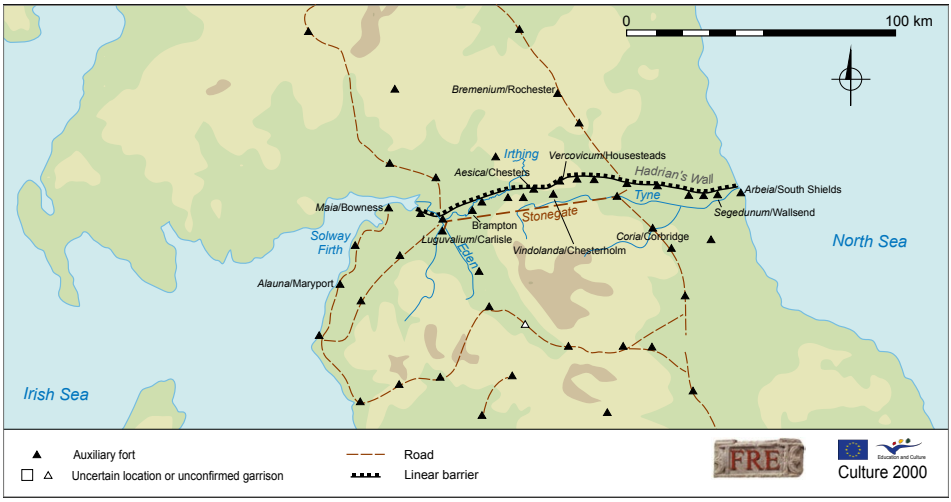

Fig. 9. Northern Britannia with Hadrian's Wall (Drawing M. Momot and P. Zakrzewski based on FRE Project maps: https://www.deutsche-limeskommission.de/en/downloads/maps/, accessed: 30.12.2025)

53 SHA, *Had.* 11, 2; cf. Graafstal 2018. Until the 19th century, Hadrian's Wall was often referred to as the Picts' Wall. The Romans, however, may have simply called it *vallum* (wall). An interesting piece of evidence in this context is a bronze *trulla* found in 2004 in Ilam, which contains the names of four forts on Hadrian's Wall along with the phrase *rigore val(l)i Aeli Draconis*. According to one interpretation, the inscription certifies that the Wall was indeed known in Antiquity as Aelius' Wall, i.e. Hadrian's Wall (Burnham et al. 2004: 344–345).

54 For a discussion on the extent and function of Hadrian's Wall, see Dobson 1986; Breeze 2011: 65–67, 85–91; cf. Campbell 2015. Evidence suggests that a line of earth and timber fortifications also existed along the 42 km stretch from Maia/Bowness to Alauna/Maryport (Crow 2004: 120). For Maia/Browness, see Austen 2009; for Segedunum/Wallsend, see Hodgson 2003.

55 This layout may have been necessitated by the need to maintain contact with the garrisons from the forts to the south (Woolliscroft 1989).

and VI Victrix, which replaced *legio* IX Hispana after AD 119. The original design featured an 80 km stretch of 3 m-wide stone wall[56] from the River Tyne to Irthing, continuing for another 48 km to Maia/Bowness as a 6 m-wide earthen rampart. A deep ditch ran along the north side, except where terrain made it unnecessary. In some sections, additional defense was provided by "trous de loup" (*lilia*) dug into the berm.[57] Access beyond the Wall was controlled through gates in small mile forts (about 15 m × 18 m) spaced at each Roman mile, or roughly 1.5 km (Wilmott 2009: 137–143). Between each pair of mile forts stood two towers for continuous surveillance, and similar structures likely topped the gates [*Fig. 11:1*].

Even as construction progressed, the original plan was altered, integrating forts directly into the Wall's course [*Fig. 11:2*]. This required dismantling some completed sections[58] but offered clear advantages: stronger garrisons on the Wall itself and increased troop mobility through additional passageways, enabling faster responses to threats. An unusual feature was the inner ditch flanked by earthen ramparts, likely intended to protect the military installations from civilians (Breeze 2015). The prolonged construction —or a sudden need to accelerate the work— led to many compromises in later sections, such as narrowing the Wall to only 2–2.5 m. Variations in completion levels are also evident. While most scholars agree that construction began shortly after Hadrian's visit in AD 122,[59] the exact completion date remains uncertain, especially since some forts may not have been finished before the frontier shifted to the north (Crow 2004: 119–131; Breeze 2011: 63–70).

Hadrian's somewhat unexpected successor —though personally chosen— was Antoninus Pius, who, like Claudius before him, quickly sought military success. In AD 139, shortly after taking power, he appointed Lollius Urbicus to lead a campaign north of Hadrian's Wall aiming to defeat the local tribes and push the frontier forward. By AD 142, work began on a new defensive barrier, the Antonine Wall,[60] stretching about 60 km between the Firth of Clyde and the Forth [*Fig. 10*]. Beyond the Wall lay the marshy Midland Valley, where at least four forward forts guarded the route to the river Tay. The fortification itself consisted of an earthen rampart, likely over 3 m high, with a 4.4 m-wide stone base. A wooden palisade and towers likely topped the structure. Behind it ran a road, while a massive ditch —12 m wide and 4 m deep— was dug in

56 Many researchers have ruled out the existence of a walkway on the top of the wall, pointing to the lack of parallels for the use of such a structure in other linear barriers of the period. However, Paul Bidwell (2008: 140) challenged these theories by raising a number of arguments that are difficult to dismiss.

57 Their presence was attested particularly in the eastern part of Hadrian's Wall (Bidwell 2005).

58 Likely for this reason, most forts to the south were abandoned (Dobson 1986: 10).

59 For the issue of Hadrian's involvement in the Wall's design process, see Breeze 2009.

60 The legions stationed in Britannia were also responsible for the construction of the Antonine Wall, and their participation in the erection of the various sections is very well attested by building inscriptions (Hassall 1983). Legionary builders could be quartered in temporary camps located on both the north and south sides of the Wall (Jones 2005).

front, with another low rampart beyond. As with Hadrian's Wall, traces of *lilia* were found on the berm. Although the initial plan included six forts along the Wall [*Fig. 11:4*], this number increased to 16 before completion, reducing the average distance between garrisons to around 3 km (Breeze 2011: 71–76) [*Fig. 11:5*]. No additional defensive measures protected the Wall from the inside, but each fort usually had at least two defensive ditches. In its final years of occupation, several forts were expanded with annexes containing additional structures such as baths (Bailey 1995). The Wall was likely abandoned no earlier than AD 158, when reconstruction of Hadrian's Wall had already begun,[61] and no later than the following decade (Hodgson 1995).

Hadrian's Wall required extensive repairs before it could be fully reoccupied (Breeze 2011: 79–82). These primarily included rebuilding the demolished gates to improve communication, and restoring sections of the inner rampart. The extent to which the forts were affected remains unclear, as some of them had seen only limited use over the previous two decades (Breeze and Dobson 1985: 10–11), but no new garrisons were added nor were existing ones expanded with annexes like those on the Antonine Wall. A notable modification, however, was the construction of a road along the inner side of the Wall [*Fig. 11:3*]. Further changes occurred later, in the second half of the 2nd century AD, including the abandonment of various towers in the central section and the narrowing of the mile fort gates. This period also saw the first purely civilian structures appear immediately adjacent to the in-

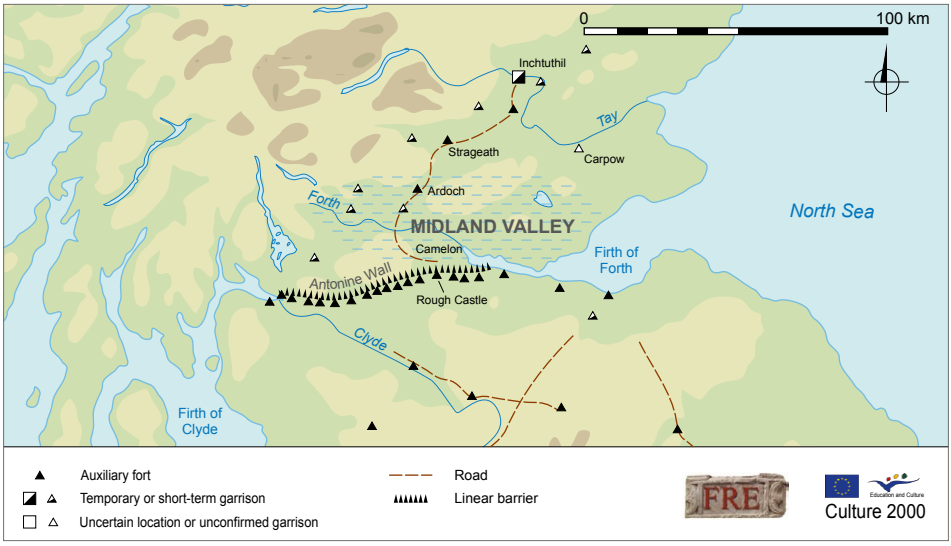

Fig. 10. Northern Britannia with the Antonine Wall (Drawing M. Momot and P. Zakrzewski based on FRE Project maps: https://www.deutsche-limeskommission.de/en/downloads/maps/, accessed: 30.12.2025)

61 This date is confirmed by a building inscription made on a stone from Hadrian's Wall by legionaries from VI Victrix (*RIB* 1389; Hodgson 2011).

ner rampart. By the early 3rd century AD, fort garrisons were reinforced with new units, possibly in response to events around AD 180, when northern tribes reportedly breached the Wall — a disturbance known only from Cassius Dio's brief account (Dio., *Hist. Rom.* 72, 8, 2). Between AD 208 and 211, Septimius Severus launched multiple northern campaigns in an effort to conquer all of Britannia, but his death ended these ambitions. Nevertheless, Hadrian's Wall remained in use, along with some garrisons north of it, until withdrawal from the island in the early 4th century AD (Hanson 2004: 137–138).

LIMES IN THE NEAR EAST

The form of the limes in the Near Eastern provinces was shaped not only by geographical and climatic factors but also by the presence of numerous earlier polities and the relationships between them,[62] especially Rome's most formidable rival — the Parthian Empire. The Roman military presence in the region began in 64 BC with the absorption of the unstable and declining Seleucid Kingdom leading to the establishment of the province of Syria, which later expanded at the expense of neighboring client states (Ball 2000: 10–15). In contrast to the province of Judea, established in AD 6, where the Roman army primarily focused on maintaining order in an unstable region (Isaac 1992: 104–113; Hall 1996), the forces stationed in Syria were tasked with guarding against external threats. This is evident from the size of the army during Augustus' reign, which included four legions: III Gallica, VI Ferrata, X Fretenesis, and XII Fulminata, along with numerous auxiliary troops. Additionally, the army could rely on the support of allied kingdoms. Although the exact locations of these units

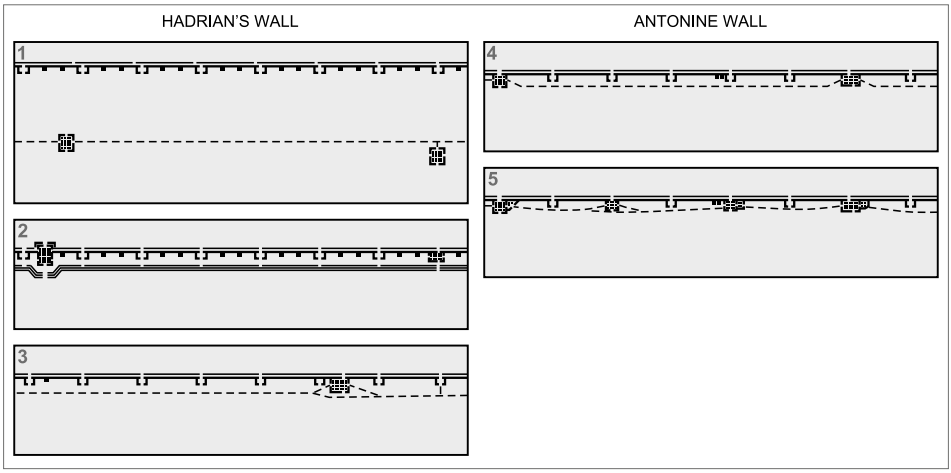

Fig. 11. Development of Hadrian's Wall and the Antonine Wall (Drawing M. Momot based on Breeze 2011)

62 For more on Rome's client states and allies in the East, see Kaizer and Facella 2010.

remain uncertain, it appears they initially operated from temporary bases in the interior of the province (Parker 2013c: 976; cf. Dąbrowa 2009).

A shift in defensive strategy began during the reign of Tiberius, when Germanicus, sent by the emperor, arrived in the province in AD 19, as tensions be-

Fig. 12. Northern part of the Near Eastern limes (Drawing M. Momot and P. Zakrzewski based on FRE Project maps: https://www.deutsche-limeskommission.de/en/downloads/maps/, accessed: 30.12.2025)

tween Rome and Parthia escalated (Tac., *Ann.* 2, 4; for more, see Isaac 1992: 19–28; Olbrycht 2018). Besides temporarily resolving the issue of the buffer Kingdom of Armenia (Olbrycht 2016: 614–623), which would significantly influence relations between the two empires for years to come (Spannagel 2000), Germanicus renewed a friendship and alliance (*amica et foedus*) with the Parthian ruler Artabanos II, who sought to formalize the agreement on the banks of the Euphrates (Tac., *Ann.* 2, 58). At the same time, Roman territorial expansion in Syria continued with the annexation of the Kingdom of Commagene (Strab., *Geog.* 16, 2.3; Tac., *Ann.*, 2, 56),[63] and the Kingdom of Cappadocia became a new Roman province (Tac., *Ann.* 12, 49.1; Dio., *Hist. Rom.* 57, 17.7), setting the Roman eastern border along the upper and middle Euphrates. During the Julio-Claudian Dynasty, legionary garrisons were likely stationed at Cyrrhus/Khoros (Parker 2000: 124), Raphanaea/Barin (Gschwind and Hasan 2013), and Zeugma/Belkis (Hartmann and Speidel 2013), the latter being an important crossing point on the Euphrates.[64]

Further changes to the organization of the limes occurred following the conflict with Parthia over Armenia in AD 55–63, during which the Syrian army, led by Gnaeus Domitius Corbulo, played a major role (Isaac 1992: 29–30; Oller Guzmán 2014: 89–94). The challenges of the Parthian war, along with the costly mistakes in the early stages of the Jewish revolt in AD 66–73 (Ball 2000: 56–60; Parker 2013c: 977) prompted a reassessment of the defense strategy for the Near Eastern provinces. Under Vespasian, this led to a redistribution of military forces. The province of Cappadocia, previously understrength, was temporarily merged with Galatia and assigned two legions, easing Syria's burden of defending the Empire's eastern frontier [***Fig. 12***]. New fortresses were established at Melitene/Eski Malatya (XII Fulminata; see Alvaro and De Persiis 2012) and Satala/Kelkit (XVI Flavia Firma, replaced in the first half of the 2nd century AD by XV Apollinaris; see Lightfoot 1998; Drahor et al. 2008), both positioned at the main crossings on the upper Euphrates. The northern part of the border along the Pontic Mountains, often raided by nomadic tribes, was safeguarded by the allied Kingdom of Iberia and forts on the southeastern Black Sea coast, supported by *classis* Pontica based at Trapezus/Trabzon (Isaac 1992: 38–39, 42–50; Bennett 2006: 83–91). Although *legio* X Fretenesis was then stationed at Jerusalem, the Syrian provincial army remained considerable [***Fig. 13***]. It included *legio* III Gallica, which had replaced the *legio* X at Zeugma/Belkis, VI Ferrata at Raphanaea/Barin, and IV Scythica, which had arrived from Moesia and was garrisoned at the new legionary base at Samosata/Samsat on the Euphrates (Keppie 1986: 421–423; Isaac 1992: 36–38; Parker 2013c: 977).

To the south of Syria lay the powerful Nabataean Kingdom, which had existed since the 3rd century BC and was allied

63 The Kingdom of Commagene was temporarily restored by Caligula and later Claudius. In AD 72, Vespasian ultimately incorporated it into the Empire (Isaac 1992: 39–40).

64 The location of legions in Syria in this period remains largely unclear (Parker 2013c: 976; cf. Keppie 1986).

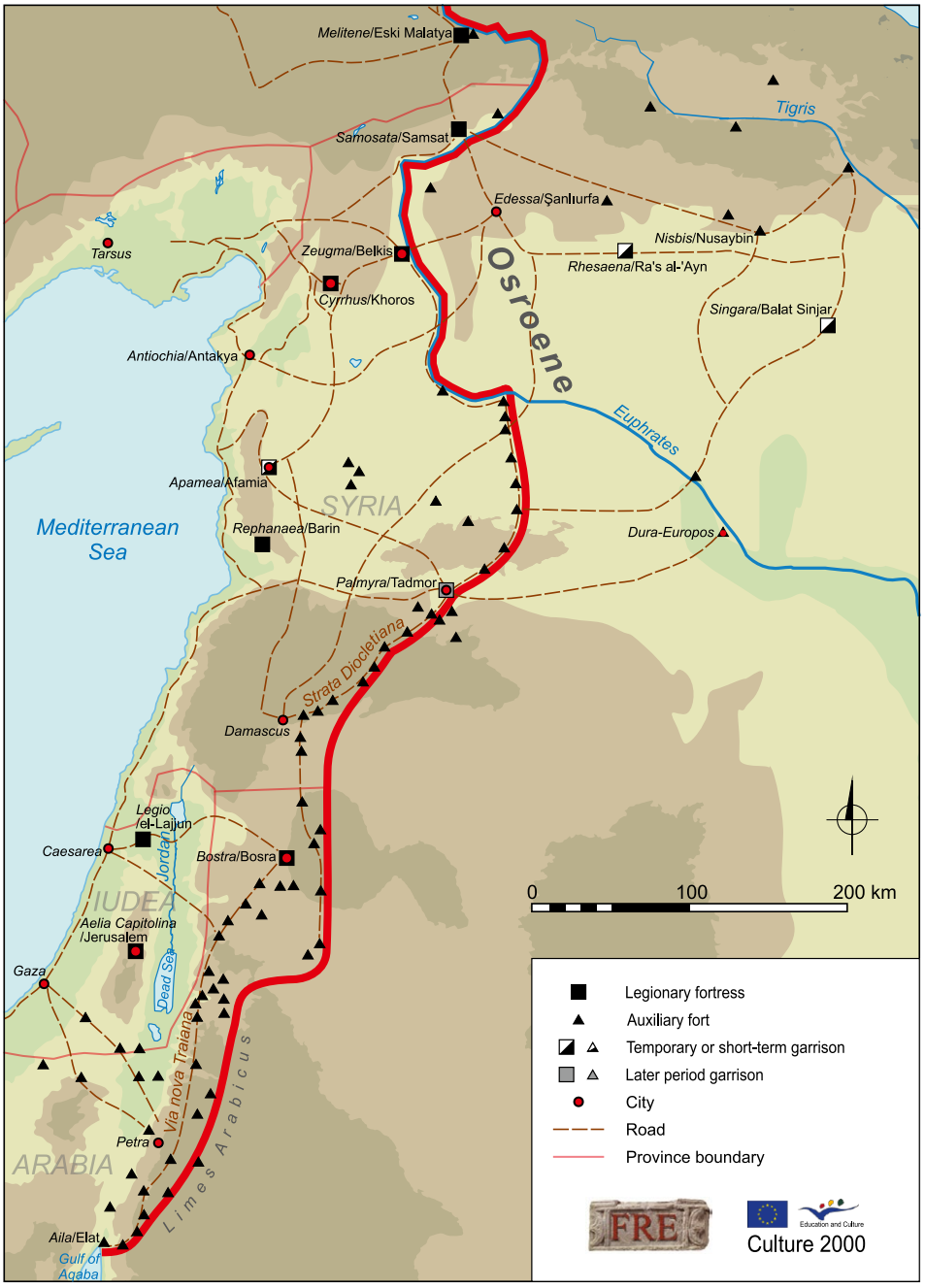

Fig. 13. Southern part of the Near Eastern limes (Drawing M. Momot and P. Zakrzewski based on FRE Project maps: https://www.deutsche-limeskommission.de/en/downloads/maps/, accessed: 30.12.2025)

with Rome (Ball 2000: 60–73). In AD 106, Trajan annexed it and established the province of Arabia, stationing *legio* III Cyrenaica at Bostra/Bosra [*Fig. 14:A*].[65] This move was likely motivated by a desire to secure the region and its trade routes against threats, including Arab tribes (Graf 1997: 123–124; 2002; Parker 1997: 116–117). During his reign, the construction of a defensive network, the limes Arabicus, began. This series of fortifications, including forts and watchtowers, extended from the Red Sea and was aligned along *Via nova Traiana*, a new road built between AD 111 and 114 that connected Bostra/Bosra with Petra and Aila/Elat on the Gulf of Aqaba (Parker and Smith 2014). Military units were likely stationed along this route (Parker 2002: 78; cf. Isaac 1992: 121). This road was strategically placed along the border of an area with enough seasonal rainfall to sustain the stationed troops and probably overlapped with a former caravan route. Small garrisons were built about 20 km apart, often on hills for better surveillance, though not always directly beside the road if a more suitable location was available (Parker 1990: 220–224; 1997: 115–118; 1999; 2002: 77–80; 2006; 2013a: 46; Graf 1997: 124–125; Findlater 2002; Parenti and Gilento 2012). The fortifications of the limes were expanded over the following centuries, with significant development under Diocletian, who extended the defenses further north along the new *Strata Diocletiana* road (Parker 2002: 79).

The 2nd century AD in the Roman Near East was dominated by wars against Parthia, waged successively by Trajan (AD 114–117), Marcus Aurelius and Lucius Verus (AD 161–166), and Septimius Severus (AD 194–195, 198–200) (Isaac 1992: 28–33). Trajan's campaign, initially aimed at restoring security in Armenia, culminated in the conquest of a large territory east of the Euphrates, including the sacking of the Parthian capital of Ctesiphon, and the creation of the province of Mesopotamia in AD 115.[66] However, Hadrian soon abandoned the newly annexed territories, recalling the army behind the Euphrates. The eastern border was now defended by Rome's allies, the Kingdoms of Armenia and Osroene, as well as new advanced outposts. In AD 135, following the suppression of the Bar-Kochba uprising, the provinces of Syria and Judea were merged, and *legio* VI Ferrata was established at Legio/el-Lajjun.[67] In AD 161, the Parthians invaded Syria and Cappadocia, initially defeating the provincial armies. However, a successful Roman counteroffensive in AD 163 restored the status quo. As a result the Romans secured further territories along the Euphrates, including the fortress city of Dura Europos (James 2019) [*Fig. 14:B*], which later served as a base for Septimius Severus' eastern campaigns. After defeating the pretender Pescennius Niger in AD 194, Severus gathered a large army and invaded Parthia, conquering territories as far as the Khabur River. He

65 The legionary garrison was a kind of annex to the existing town (Sartre 1985; Lenoir 2002; Parker 2013b).

66 On Trajan's campaign, see Dio., *Hist. Rom.* 48, 17–30; cf. Lightfoot 1990.

67 For more, see Tepper et al. 2013; 2021; Ernenwein, Adams, and Tepper 2020. The legionary base was probably already constructed after AD 117 by *legio* II Traiana (Rea 1980).

reconstituted the province of Mesopotamia, although without its southern territories (Ball 2000: 17–19). The provincial army consisted of two legions: Parthica I and III, stationed in the oasis cities of Rhesaena/Ra's al-'Ayn and Singara/Balat Sinjar, while II Parthica was garrisoned in Apamea/Afamia. Severus also divided Syria into Syria Phoenice and Coele, adding the annexed part of Osroene (Parker 2013c: 978).

The rise of the Sassanid Dynasty in AD 224 coincided with the beginning of the crisis of the 3rd century AD for the Roman Empire. Shapur I, the ambitious Sassanid king, capitalized on this instability, defeating the Roman army several times and reaching as far as Antioch, Syria's capital, which he sacked. The Romans' growing weakness was particularly evident when Dura Europos fell in AD 256, and Emperor Valerian was captured after losing the Battle of Edessa in AD 260 (Ball 2000: 22–23). Order was only restored by the intervention of the mighty Kingdom of Palmyra, which later took control of most Roman eastern territories and sought autonomy (Ball 2000: 74–83). Lasting peace in Syria and the Roman Near East was not achieved until the reign of Diocletian, whose building projects enabled the restoration and construction of many Roman fortifications and garrisons.

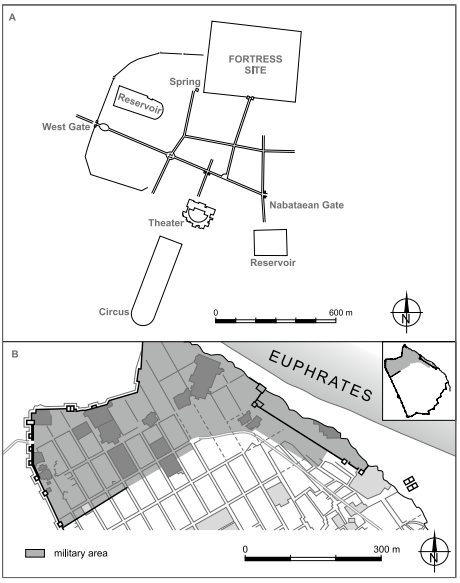

Fig. 14. Bostra/Bosra (A) and Dura Europos (B) (Drawing M. Momot based on Parker 2013b and James 2019)

LIMES IN NORTH AFRICA

The Roman Empire's boundaries in North Africa stretched from the Atlantic to the Red Sea. During the Principate period, this vast and diverse region was divided into six provinces. The limes ran through the mountainous and upland territories of the western Maghreb (Mauretania Tingitana and Caesarensis), the plateaus and desert zones (Numidia and Africa Proconsularis), the fertile lands of eastern Libya (Cyrenaica), and ended in Egypt (Aegyptus). Roman conquests in Africa began early, but the Empire's full territorial extent was not reached until the early 3rd century AD. First, following the defeat of Carthage in 146 BC, the province of Africa Proconsularis was created, later extending to include Tripolitania. Cyrenaica was ceded to Rome in 96 BC by its last ruler, Ptolemy Apion. After Augustus' victory over Mark Antony and Cleopatra in 31 BC, Egypt became a Roman province. Numidia was conquered by Caesar in 46 BC, and Mauretania was

annexed in AD 40 following the assassination of its ruler, Ptolemy, by the order of Caligula.

Ancient North Africa was home to various tribes, mainly of Berber origin, such as the Nasamones, Musulamii, Gaetuli, and Bavares. These tribes with a pastoral economy and a semi-nomadic lifestyle (Mattingly 1994: 36–57; 2003) often cooperated with the Roman administration in exchange for regional autonomy. However, conflicts frequently arose over issues of compulsory military service, taxes, and land for livestock grazing (Elton 1996: 103–104).[68] The Garamantians (Garamantes), a powerful tribal confederation in the Fezzan region of present-day southern Libya, posed a threat to the Roman order.[69] Their army, primarily composed of light cavalry, enabled them to carry out swift raids (Mattingly 1994: 61–64).[70] In response to periodic plundering, in 20 BC Cornelius Balbus led an expedition of 10,000 men that defeated the Garamantes and plundered their capital Garama and 14 other settlements, for which he received a triumph in Rome in the same year (Ptol., *Geog.* 1, 8, 2; 12, 4; Plin, *Nat. Hist.* 5, 38).[71] Tacitus later mentions the Garamantes as allies of Tacfarinas during his rebellion (Tac., *Ann.* 4, 23; cf. Bénabou 2005: 75–84). From the third quarter of the 1st century AD onwards, the Garamantians maintained peaceful relations with the Empire, participating in trade and supporting further expeditions into the African continent.[72] Hostilities resumed in the early 3rd century AD when Septimius Severus sought to extend the African limes further south into the desert. Anicius Faustus, a legate of *legio* III Augusta, led a campaign against the Garamantes, resulting in the annexation of vast territory and the establishment of new garrisons, in particular at Cydamus, Myd…/Gheriat el-Garbia, and Gholaia/Bu Ngem (Witschel 2006).

The southern border of North Africa was marked by a sparsely populated desert area, where the threat of a significant external attack was low. This influenced the number of military units stationed in the region (Le Bohec 1989a; 1989b; Farnum 2005: 90–93). In this context, ensuring safe communication and a steady supply of resources, mainly water, was more critical than defense against invasions (Mattingly et al. 2013: 60–83). The positioning of military installations in the provinces of North Africa varied both in terms of location and number of soldiers. They tended to be strategically positioned at intersections of major communication routes running along the frontier and into the Roman territory.

68 For the issue of seasonal migration of nomadic tribes in African provinces, see Trousset 1980b.

69 Their first mention in written sources appears as early as Herodotus (*Hist.* 4, 183; cf. McCall 1999).

70 For more on the Garamantes, see Ruprechtsberger 1997a.

71 Eventually, the expedition led by Balbus was to reach as far as the Niger River. In any case, a Roman presence in this period is confirmed by pottery discovered in southern Libya (Dore and van der Veen 1986).

72 On the Garamantes and their relations with Rome in the 1st to 3rd centuries AD, see Bénabou 2005: 101–111. For more about Roman expeditions in the Sub-Saharan area, see Joorde 2015.

In Mauretania Tingitana, two mountain ranges —the Rif to the north and the Middle Atlas to the south— dominated the landscape. Military forts were located along two main roads leading from the provincial capital, Tingis/Tangier, to the southern cities of Sala/Chellah and Volubilis/Meknes (Rebuffat 1998; Mattingly et al. 2013: 60).[73] While these cities had their own fortifications (Euzennat 1989: 159–174, 201–239), garrisons were established in their vicinity to protect them, following two distinct organizational concepts [*Fig. 15*].

Approximately 6 km south of Sala/Chellah, situated at the end of a road running along the Atlantic coast, at the mouth of the Oued Bou Regreg, was a 12 km long line of stone-and-earth fortifications stretching to the coast. The remains of this linear barrier, still visible today, consist of a V- or U-shaped defensive ditch, partly cut into the rock, with a maximum width of around 4 m and a depth of 2 m. A rampart originally located on its northern side may have reached a height of 0.5–1.5 m. Artifacts found in the filling of the ditch dated both defensive works to the Flavian Dynasty. Probably in the second half of the 2nd century AD, the fortifications were rebuilt replacing earthworks with stone constructions. A wall about 1 m wide at the base, with a reconstructed height reaching 2.5 m, was erected about 1 m south of the ditch, with stone towers

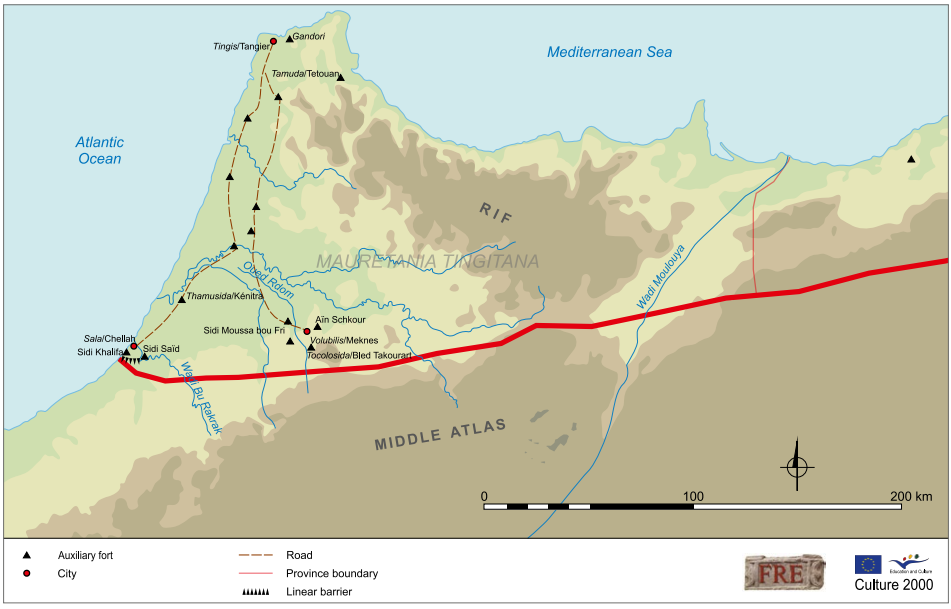

Fig. 15. The limes in the Mauretania Tingitana province (Drawing M. Momot and P. Zakrzewski based on FRE Project maps: https://www.deutsche-limeskommission.de/en/downloads/maps/, accessed: 30.12.2025)

73 A notable exception was the heavily fortified fort at Tamuda/Tetouan, situated in the northern part of the province near the Mediterranean coast (Campos et al. 2011; Bernal Casasola et al. 2012).

along its course (Euzennat 1989: 129–173; Napoli 1997: 397–407). Two forts were also identified near the ends of the line of fortifications (El Bouzidi and Ouahidi 2014: 107–108). This barrier likely served to secure access from the south, protecting the city against nomadic tribes, possibly Autololes, said to have threatened Sala (Plin., *Hist. Nat.* 5, 9).

In contrast to Sala/Chellah, Volubilis/Meknes was secured by an extensive defense network, including four forts and numerous watchtowers, ensuring surveillance of the surrounding countryside and the Oued Rdom (El Bouzidi and Ouahidi 2014: 97–106).[74] Later, partly fortified farms were also incorporated into this defense system (El Bouzidi 2005). This satellite network aimed not only to protect the city but, more importantly, its rural hinterland, from which it derived significant financial benefits (El Bouzidi and Ouahidi 2014: 102, n. 23).

Despite the eastern boundary of the province extending as far as Flumen Malva (Oued Moulouya), no Roman garrisons have been found for another 350 km. This likely reflects the absence of Roman settlements in the area, which, though administratively under Roman control, was probably governed by allied Berber tribes (Christol 1988; Rebuffat 1999).

The neighboring province of Mauretania Caesariensis also featured a mountainous and upland landscape, but its terrain shaped the limes in a different way. Two mountain ranges parallel to the Mediterranean coast divided the region, with fertile, narrow plains clustered along river valleys (e.g. the Chélif River) between them. Further south, bounded by the Saharan Atlas, lay the Hautes Plaines, less fertile and much more arid, but cultivable owing to abundant seasonal rainfall and irrigation systems (Mattingly et al. 2013: 64).

Until the 1st century AD, provincial army units were concentrated around Caesarea/Cherchel. The first forts farther inland, along the Chélif River valley about 50 km to the south, were established under Claudius, with additional ones built during the Flavian period. A more structured defensive line, which emerged in the early 2nd century AD [*Fig. 16*], formed a sparse network of forts along a newly built road stretching from Siga/Aïn Témouchent in the west to Zarai on the Numidian border. Watchtowers were placed between some forts, such as Rapidum/Sour Djouab and Auzia/Sour el-Ghozlane. While this system enabled rapid movement of troops, it was not an effective border control mechanism but rather a means of securing travel routes. In the late 2nd and early 3rd centuries AD, the defensive zone shifted even farther south, beyond the second mountain range, leading to the abandonment of most earlier installations except for key forts at major road junctions. The new, much more densely spaced garrisons and fortifications were linked by the Nova Praetentura road,[75] which passed through two different topographical zones. Its western section, between Numerus Syrorum/Lalla Maghina and Tingartia/Tiaret, ran through the mountains, while its east-

74 For more recent information concerning the external fortification system of Volubilis, see Czapski 2017.

75 The name is preserved on milestones (*CIL* VIII 22602=*ILS* 5850; *CIL* VIII 22611).

ern stretch followed their southern foothills along the northern edge of the vast Hautes Plaines, offering excellent vantage points over the steppe to the south (Mattingly et al. 2013: 66–68).[76]

The province of Africa Proconsularis was more accessible and consisted mainly of plains, semi-deserts, and deserts, though mountainous areas were present, particularly in the north. It can be divided into three regions: the central part, the narrow coastal strip of Tripolitania in the east, and Numidia in the west; the latter had gained full provincial status already during the Principate.

Fortified frontiers began to develop with the establishment of a permanent base for *legio* III Augusta at Ammaedara/Haidra around AD 14 (Mackensen 1997). A road connected this base with the Capsa/Gafsa Oasis and the coastal town of Tacapae/Gabès, both likely housing small garrisons manned by detachments (*vexillationes*) from the legion. Around AD 75, the legion was relocated southwest to the Aures Mountains (Jebel el-Auras), prob-

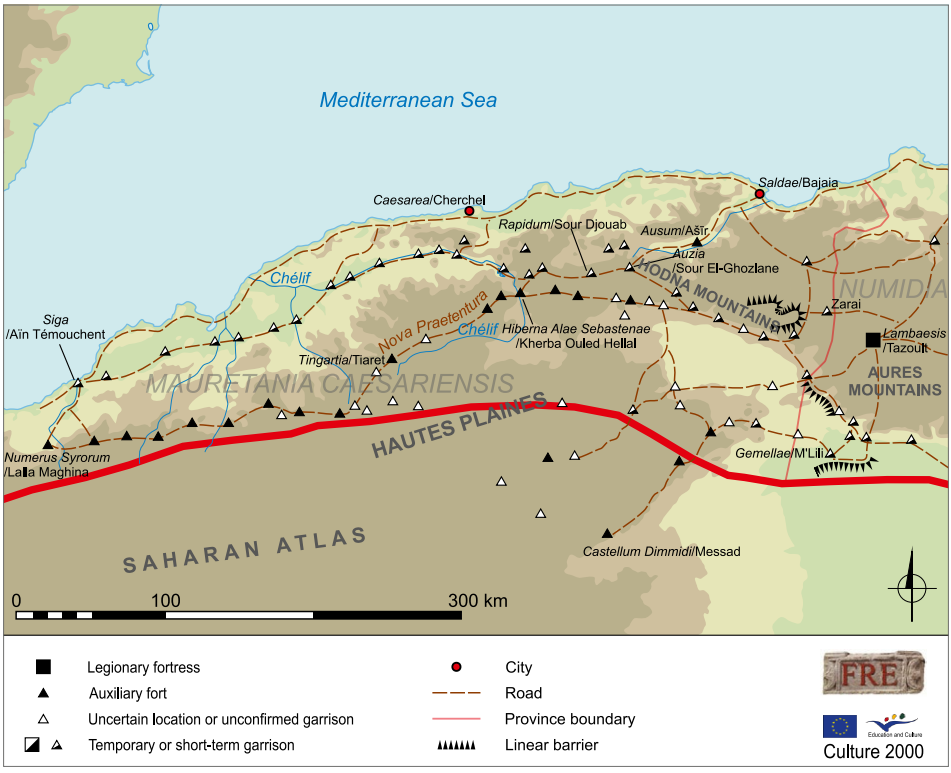

Fig. 16. The limes in Mauretania Caesariensis (Drawing M. Momot and P. Zakrzewski based on FRE Project maps: https://www.deutsche-limeskommission.de/en/downloads/maps/, accessed: 30.12.2025)

76 Some epigraphically attested fort names, such as Hiberna Alae Sebastenae/Kherba Ouled Hellal, suggest that some of these forts may have served seasonally as winter quarters for troops engaged in patrolling the southern areas (Breeze 2011: 143).

ably to Theveste/Tebessa (Le Bohec 1989a: 360–361), around which a network of small forts was constructed. One of these, Lambaesis/Tazoult, was built in AD 81 and later expanded under Trajan and Hadrian into a full legionary base (Cagnat 1908; Groslambert 2010). Its strategic location secured the region east of the Hodna Mountains and facilitated expansion of Roman fortifications beyond the Aures Mountains to the desert frontier (Mackensen 2006: 62–65).

Most likely around the same time or shortly after, construction began on a system of long linear barriers known as the *fossatum Africae*.[77] Although their exact chronology remains uncertain, these fortifications were used and further developed until the late Imperial period (Napoli 1997: 60–72, 408–447). One of the best-preserved sections, near the fort of Gemellae/M'Lili,[78] extended about 60 km and featured a 1.5–3 m thick, 2.5 m high mudbrick wall, accompanied by a defensive ditch 4–6 m wide and 3 m deep. The fortification line also included towers (4.5 m × 5.5 m) and single-passage gateways. While these structures offered defensive and observational advantages, their primary function —like many similar linear fortifications in North Africa— was to regulate movement, as indicated by the numerous fortified passages.

With the separation of Numidia from Africa Proconsularis at the end of the 2nd century AD, the fortified frontier extended even further southwest. One of the most remote outposts was Castellum Dimmidi/Messad (Picard 1947), likely built to monitor local communities near the oases, which were considered a potential threat.

Similar precautions and the need to control population movement largely shaped the development of the limes Tripolitanus to the east, where conflicts with the semi-nomadic tribes are well documented (Bénabou 2005). Beyond a narrow line of fertile coastal land, Tripolitania was largely desert. Garrisons in this area [*Fig. 17*] were positioned to secure transport routes and scarce freshwater sources. From the second half of the 1st century AD, a network of forts emerged, accompanied by numerous linear barriers of earth and stone,[79] often built in natural conduits used as main communication routes.[80] Though much shorter than the aforementioned *fossatum Africae*, these barriers served a similar purpose. The Tripolitanian limes saw further expansion under Septimius Severus, a native of nearby Leptis Magna/Khoms (Mackensen 2006: 65–69). He ordered the fortification

77 The main propagator of this term was Jean Baradez (1949a), who discovered and analyzed them based on aerial photographs and archaeological research.

78 During his investigations, Baradez identified several sections whose existence has been questioned. One such example is the remains of a ditch near the Ad Maiores fort, which were later reinterpreted as a road (Trousset 1980a). There are also ongoing doubts regarding the section he described that was thought to encircle the Hodna Mountains (Breeze 2011: 82). For more on Gemellae/M'Lili, see Baradez 1949b.

79 Twenty sections of such fortifications are currently known in the Tripolitania region, where they run parallel to the road leading from Capsa/Gafsa via Tacapae/Gabès to the southeast.

80 The size of these constructions is illustrated by the wall near Bir Oum Ali, preserved to a height of 4 m (Krimi 2007: 142–145).

of remote desert oases, leading to the construction of forts such as Myd.../Gheriat el-Gharbia and Gholaia/Bu Ngem.[81]

Of all the North African provinces, Cyrenaica has the least well-documented military infrastructure. During the Principate, its garrison consisted of only one or two auxiliary units,[82] dispersed among small defensive installations along the main road and near water sources (Mattingly et al. 2013: 82).

Fig. 17. The limes in Numidia and Africa Proconsularis (Drawing M. Momot and P. Zakrzewski based on FRE Project maps: https://www.deutsche-limeskommission.de/en/downloads/maps/, accessed: 30.12.2025)

81 Both forts are among the best-preserved Roman fortifications from the Principate period (Goodchild 1954; Mackensen 2016; 2021).

82 The increased but brief presence of the Roman army in the province was due to the Jewish uprising in AD 115.

Located at the eastern end, the province of Egypt presented a unique case in military organization due to its special status [*Fig. 18*]. The primary role of its garrison was to maintain order in major cities,[83] where ethnically diverse and often contentious groups, particularly Greeks and Jews, coexisted. However, its border defense shared many characteristics with other provinces.

Fig. 18. The limes in Aegyptus (Drawing M. Momot and P. Zakrzewski based on FRE Project maps: https://www.deutsche-limeskommission.de/en/downloads/maps/, accessed: 30.12.2025)

To the west, Egypt was shielded by the Libyan Desert, one of the driest and most inhospitable parts of the Sahara, while its eastern frontier lay along the Red Sea. To the south, it bordered on the Kingdom of Kush, whose forces successfully invaded Roman frontier areas in 25 BC. Rome's swift response led to the destruction of Meroe, the annexation of part of Meroitic territory, and the establishment of a garrison far to the south at Primis/Qasr Ibrim (Alexander 1988). Defense of this new frontier relied on a chain of small forts along the Nile, beginning at Syene/Aswan (Maxfield 2009). This arrangement remained unchanged until the second half of the 3rd century AD, when a general crisis affected the Empire. Diocletian restored the frontier in AD 297–298, ordering new fortifications and ceding part of the territory to the Nobatae to create a buffer kingdom.

A more complex defense system existed in the Eastern Desert (Arabian Desert), a region of vital economic importance due to its rich natural resources and extensive trade network linked to coastal ports. Beginning in Vespasian's reign, around 70 small forts were built to protect transport routes, mines, and quarries. Some measured just 30 m², housing no more than 15 soldiers. In addition to military functions, these forts also served as stations for traveling caravans (Maxfield 2005; 2009).

CONCLUSIONS

While some of Augustus' successors pursued further conquests —despite his posthumous advice to Tiberius as recorded by Tacitus (*Ann.* 1, 11)— none matched his

83 Strabo (*Geog.*, 17, 1, 12) mentions three legions stationed in Alexandria, Heliopolis, and Thebes, as well as nine cohorts.

scale of expansion. However, the strategy of securing frontiers with stationed troops, established under Augustus, was not only maintained, but also significantly developed. By the 1st century AD, the multitude of fortified garrisons had reduced the average distance between them, with frontier defenses along the Rhine and the Danube spaced about 30–40 km apart (Breeze 2011: 169–170). The large-scale relocation of troops to the borders reflected a diminished need for military presence within the pacified provinces. This distributed deployment improved security, enhanced border surveillance, and prevented over-exploitation of local resources, particularly food (Dobson 2009: 31). It also helped disperse large army concentrations, reducing the risk of ambitious commanders leveraging them in times of crisis.[84] Over time, smaller forts and watchtowers played an increasingly vital role in border security (Symonds 2018: 33–92).[85]

A key shift in frontier defense was the gradual replacement of early Roman fortifications —originally built of earth and wood— with more durable, mainly stone structures.[86] This transition was driven not only by the need to improve defensive capabilities, but also by the frequent maintenance required for structures made of perishable materials (Bishop 2012: 14–15).[87]

Another significant shift occurred in the first half of the 2nd century AD, when most Rome-dependent polities had already been incorporated into the Empire. At this point, Imperial borders took on a clearly defined shape, marked not only by natural features, but also by elongated artificial barriers built of stone, wood, or earth (Luttwak 1976: 60; Breeze 2011: 40–41). While temporary defensive structures had long been employed by the Roman army (App., *Hist. Rom.* 14, 118–120; Caes., *Bell. Gall.* 2, 1; Plut., *Crass.* 10, 4–6) it was under Hadrian that their large-scale, permanent construction began (Webster 1985: 66–68). In the following years, this system was expanded and refined,[88] primarily to regulate and control the movement across Imperial frontiers. During the 2nd century AD, continuous reinforcement of vulnerable sections of the limes and an increased reliance on auxiliary troops further reduced the distance between fortified posts to roughly half a day's march (Breeze 2013: 170). While this vast network of garri-

84 See above, n. 21.

85 The earliest examples of such military installations, discovered in Upper and Lower Germania and on the Upper Danube, were dated respectively to the reigns of Augustus, Tiberius, and Claudius (Breeze 2011: 170).

86 The first garrison to be rebuilt with stone fortifications was the legion fortress of Vetera I/Xanten, likely in the mid-40s AD.

87 Stone fortifications were built earlier to defend large civilian settlements and military garrisons in areas where wood was scarce or where stone was more readily available. However, even in later periods, such as the 2nd to 3rd centuries AD, there are numerous examples of the continued use of wood and other materials in the construction of fortifications due to limited access to stone (Hanson 2009).

88 So far, numerous examples of linear barriers built by the Romans have been discovered — including some outside the Empire (Napoli 1997).

sons required considerable resources, it did not signal a shift to purely defensive strategies — the Romans continued territorial expansion in the next century.[89] In the second half of the 3rd century AD, new fortification designs emerged, featuring smaller, irregularly shaped forts and fortresses. These featured protruding towers for wing defense, reinforced gates with narrow passages, and above all, higher and thicker walls. Artillery also became an increasingly important component of garrison defense (Băjenaru 2010; Burns 2016).

The range of innovations introduced by the Romans between the 1st and 3rd centuries AD in fortification design reflects the broader evolution of the Empire's border defense strategy, the role of military forces for this purpose, and the transition from a hegemonic to a territorial empire (Le Bohec 2000: 150–151).

The Roman defense system was highly complex and heterogeneous. Despite shared features and general design principles —such as those seen in linear barriers— fortifications could take on vastly different forms depending on local conditions. This variability is unsurprising, as the Romans, despite their ambitions and sense of superiority, recognized various limitations — some they could address (e.g. garrison strength, fortification quality) and others beyond their control (e.g. natural conditions). Thus, they adapted to circumstances unless the modifications proved overly labor-intensive or costly. David Woolliscroft's distinction between two types of Roman fortification systems is illustrative: one system was adapted to the terrain and geography, and the other disregarded natural obstacles and topography (Wooliscroft 2001: 152). A notable example of this is the course of the linear barriers built in Upper Germania and in Raetia [see *Fig. 3*].

At the same time, it is evident that many provincial fortification systems were unique, shaped by the interplay of variables such as topography, available building materials, threat levels, and the period of construction and use. In Britain, for instance, the limes was primarily influenced by the island's elongated shape and the constant threat from the barbarians in its northern part. In Dacia, the province itself acted as a large, naturally fortified stronghold, defended mainly by infantry units positioned in mountain passes and river valleys that constituted the only access routes, with cavalry placed inside the province, usually at the junctions of the main roads. The design of its defense system, developed relatively late, was likely influenced by earlier experiences in creating the limes along the Rhine, in Upper Germania and Raetia, and on the Danube. Geographical factors were also a key, though not the sole, determinant in the density of garrison deployment. Sections of the limes with no significant threats, like those in Cyrenaica, Egypt, and the Libyan Desert, only received forts when the situation demanded it. A striking contrast emerges when comparing the placement of garrisons in the Empire's western and eastern provinces. Although the long-standing belief that military units were

89 Already in the early 3rd century AD, Septimius Severus launched military campaigns to extend the Empire's borders, i.a. in Britain, east of the Euphrates, and in North Africa. It was also during his reign that the Tripolitanian limes was finally developed (Birley 1999: 153).

stationed directly in or near large Near Eastern cities is being reassessed in the light of new evidence, it is clear that this practice did occur in some instances [see *Fig. 14*]. However, the reasons for this may relate to difficulties in obtaining building materials or the different supply systems in these regions.

When seeking to identify common traits and unique features of the limes across the Empire, two factors stand out: the state of research on a particular section and the state of preservation of its defensive structures. North Africa and Near East, with their impressive and well-preserved fortifications, hold significant promise for further studies, though research progress remains limited. In contrast, many sections of the European limes have been extensively investigated for decades. However, urbanization and continuous settlement since Roman times have led to irreversible loss of much archaeological data concerning fortifications.

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Abbreviations

Ancient sources

App., *Hist. Rom.*	Appianus Alexandrinus, *Historia Romana*
Caes., *Bell. Gall.*	Gaius Iulius Caesar, *Commentarii rerum gestarum belli Gallici*
Dio., *Hist. Rom.*	Cassius Dio, *Historia Romana*
Flor., *Ep.*	Florus, *Epitomae de Tito Livio bellorum omnium annorum septingentorum libri duo*
Front., *Strat.*	Sextus Julius Frontinus, *Strategemata*
Her., *Hist.*	Herodotus, *Historiae*
Ios. Flav., *Bell. Jud.*	Flavius Josephus, *Bellum Iudaicum*
Plin., *Hist. Nat.*	Gaius Plinius Secundus (Maior), *Historia Naturalis*
Plut., *Crass.*	Lucius Mestrius Plutarchus, *Vitae Parallelae*
Ptol., *Geog.*	Claudius Ptolemaeus, *Geographia*
SHA	*Scriptores Historiae Augustae*
Strab., *Geog.*	Strabo, *Geographica*
Suet., *Cal.*; *Claud.*; *Dom.*	Gaius Suetonius Tranquillus, *De vita Caesarum*

Tab. Peut.	*Tabula Peutingeriana* = Codex Vindobonensis 324
Tac., *Agr.*	Cornelius Tacitus, *De vita et moribus Iulii Agricolae*
Tac., *Ann.*	Cornelius Tacitus, *Annales*
Tac., *Germ.*	Cornelius Tacitus, *Germania*
Tac., *Hist.*	Cornelius Tacitus, *Historiae*

Epigraphical sources

CIL	*Corpus Inscriptionum Latinarum*. Berlin–Paris 1863–2006
ILS	Dessau, H. (ed.), *Inscriptiones Latinae Selectae*. Berlin: Weidmann, 1892–1916
RIB	Collingwood, R.G. and Wright, R.P., *The Roman inscriptions of Britain* I. Oxford: Clarendon Press, 1965

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