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Sophie Krausz

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New Archaeological Perspectives

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Chapter 9

Gauls under siege: Defending against Rome

Sophie Krausz

Introduction

Ever since the 19th century, many French and British scholars have pondered over Julius Caesar's strategies in the Gallic War, endeavouring to reconstruct the famous sieges that enabled him to defeat the Gauls between 58 and 51 BC. Looking through the books of the time by Camille Jullian (1920), Colonel Eugène Stoffel (1887) or Rice Holmes (1903), it is noticeable that the authors sided mostly with the Romans, openly admiring the art of war as practised by Julius Caesar. Some of those scholars, like the emperor Napoléon III (1865), a great admirer of Vercingetorix, attempted to understand how the Gauls defended themselves against the Romans. But they could not get very far with this approach since the Gauls almost always lost their battles against the Romans and were massacred after the great sieges as at Avaricum and Alesia in 52 BC. In the end, scholars came to believe that the Gauls were just too poorly organized to hope to get the upper hand over the Romans; they could not match their opponents' military skills. Admittedly, in defence of our 19th-century predecessors, very little evidence can be found in Caesar's *Commentaries* about Gallic military strategies and tactics. Caesar speaks primarily about himself, his style of command, and his military successes. His description of how the Gauls defended themselves against the Roman army are far less detailed and we have to read between the lines or even guess at what might have happened.

Alongside the literary sources, the archaeology of fortifications can play a fundamental role in reconstructing the forms of defence implemented by the Gauls before and during the Gallic War. The study of ramparts has the advantage of being scientifically objective because, unlike textual analysis, it does not adopt a Roman perspective. On the contrary, it can be used to provide some degree of understanding of the point of view and the intentions of the Gauls. Archaeological study can also determine whether or not the ramparts were specifically designed for warfare, and

what social, cultural and political function they might have had. This archaeological approach does not exclude recourse to what Caesar wrote and the testimony of the proconsul of Transalpine Gaul remains highly valuable. His text may take on new meaning and ultimately is of enhanced worth when set against the archaeological sources. In this contribution, I will show that the design of Gallic ramparts extends beyond the context of architecture alone. Constructing effective fortifications presupposes mastery of specific technology, combining knowledge of architecture and military engineering specifically adapted to defensive works. In the ancient world, the standard reference was Greek siegecraft, which developed from the 6th century BC onwards and reached a peak under the Macedonian kings. It took highly skilled engineers to design the defensive systems of Philip II of Macedon and his son Alexander the Great and to come up with new war machinery capable of launching projectiles. The earliest treatises on the art of siege warfare that have come down to us date from the 4th and 3rd centuries BC; that of Aeneas Tacticus (the Tactician) around 355 BC, and then Philo of Byzantium in the 3rd century BC. In the 1st century BC, the treatise on war machines by Vitruvius was the first of its kind in Latin. The generals of the Roman Republic like Caesar had most certainly read the Greek and Latin theorists. In a world where the art of warfare had been cultivated and developed for centuries, it may well be asked what the designers of the Gallic ramparts knew about the subject.

The Bituriges up against Caesar in 52 BC

The territory of the Bituriges is well known today from the many archaeological excavations conducted there in the last 40 years especially in the agglomerations and *oppida* of the Gauls (Augier and Krausz 2012). This territory formed one of the largest *civitates* of central Gaul and its ancient boundaries coincide with those of the modern province of Berry (Figure 9.1). Caesar indicates that Avaricum (Bourges) was the capital of the Bituriges (BG 7.13) and mentions the name of this people for the first time in Book 7, which relates the events of the dreadful year 52 BC. Book 7 begins with the massacre of Cenabum, now the city of Orléans (Loiret), and ends with Vercingetorix's capture at Alesia (Reddé this volume). Between these two events, Caesar confronted the peoples of central Gaul on several occasions (Figure 9.2). In the winter of 53–52 BC, the Roman legions were quartered in north-eastern Gaul in the lands of the Lingones and Senones. The proconsul had returned to Rome for the winter, believing the region was peaceful enough. This was precisely the moment the Gauls chose to rise against the Romans and it was the Carnutes who were first to revolt: two men organized the massacre of several Roman traders based at Cenabum (BG 7.11). Among the victims was Caius Fufius Cita, a Roman knight whom Caesar had made quartermaster. The murders signalled the Gauls' intent to interfere with the Roman army's supplies, and the moment was particularly propitious as Caesar was away from Gaul. News of the Carnutes' action reached the Arverni in a matter of hours (BG 7.3). It is at this point in his account that Caesar introduces Vercingetorix, a young leader of the Arverni,

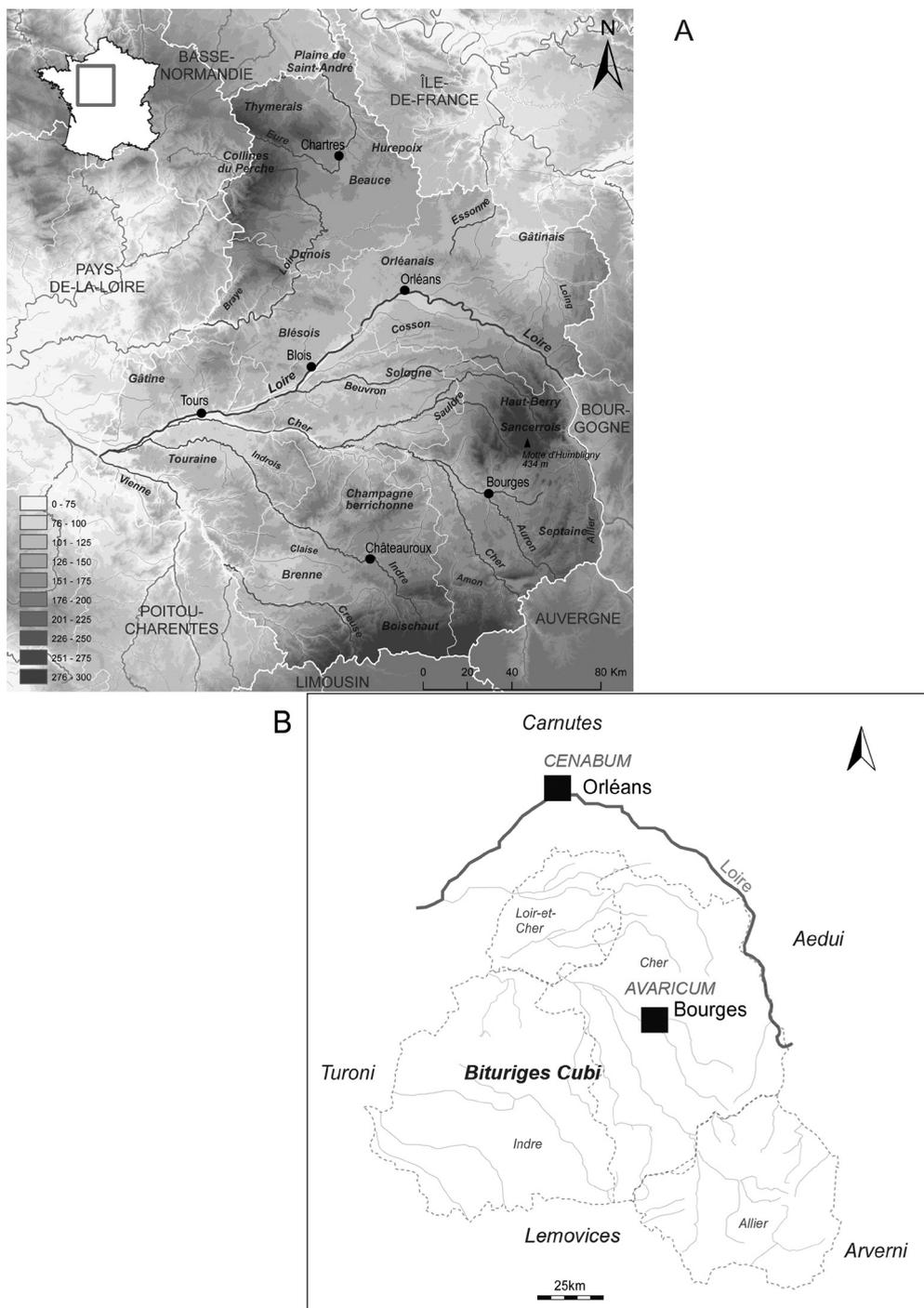


Figure 9.1 (A) Map of the Centre-Val de Loire region, France. (B) Map of the territory of the Bituriges and modern Berry (S. Krausz).

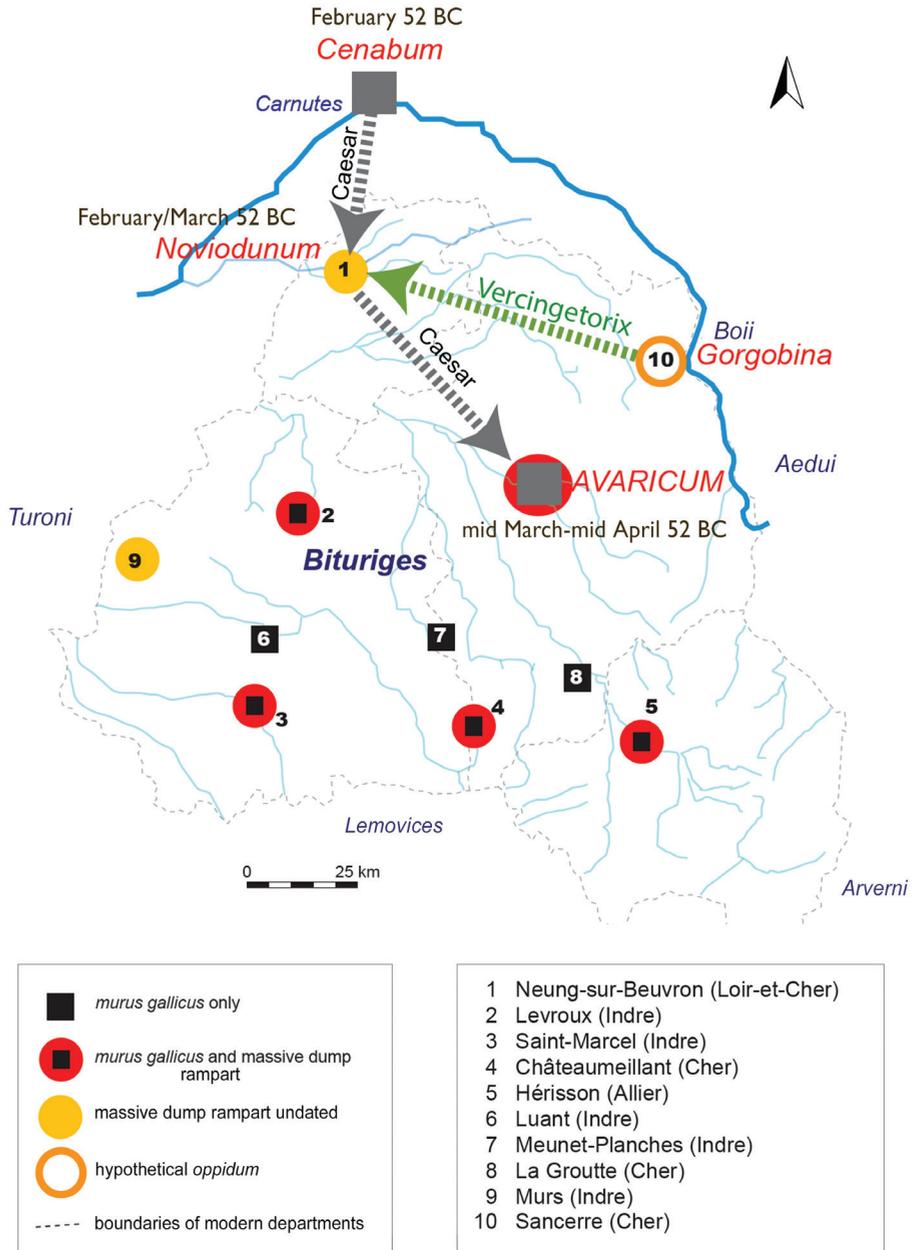


Figure 9.2 The main movements of Caesar and Vercingetorix between February and April 52 BC (S. Krausz).

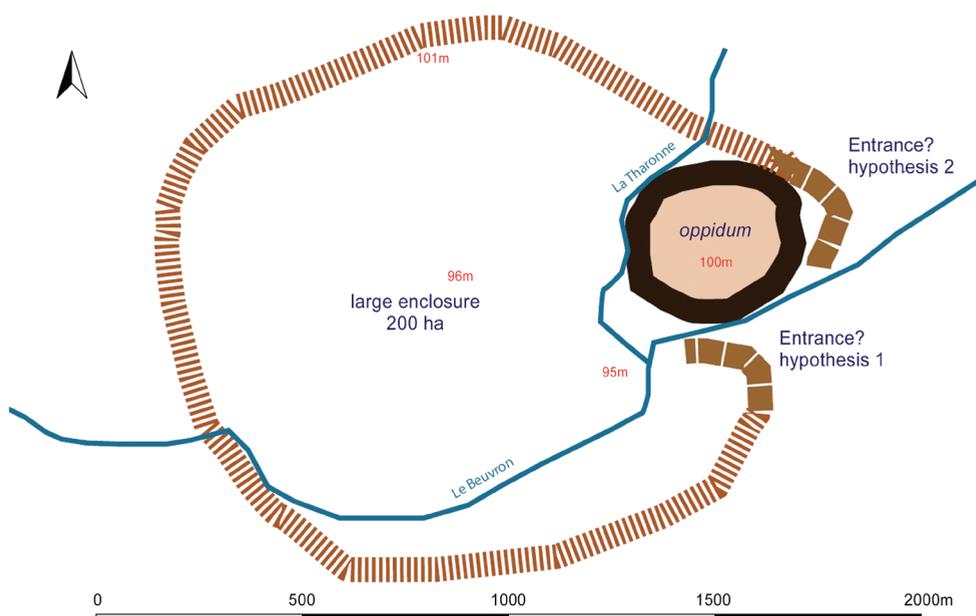


Figure 9.3 Neung-sur-Beuvron, Loir-et-Cher: plan of the oppidum (Noviodunum biturigum) and potential territory or pagus (S. Krausz, on © Google Earth background image).

who calls on the peoples of Gaul to rise against Rome: the Arverni, Carnutes, peoples of the Seine, of the middle and lower Loire and also the tribes of western Gaul joined Vercingetorix, who was proclaimed king. The Aedui, who were allies of Rome and known to the other Gauls as ‘Brothers of the Republic’, hesitated to join the coalition. Caesar’s trust in the Aedui wavered and he undertook violent reprisals against the Gauls: first he took Cenabum to avenge the death of the Roman citizens there, then he destroyed the capital of the Bituriges and massacred the population of Avaricum. This episode was the beginning of a game of cat and mouse between Caesar and Vercingetorix that was to end at Alesia in September 52 BC.

The *oppidum* of Noviodunum

After the massacre of Cenabum, Caesar headed for Avaricum and arrived at the *oppidum* of Noviodunum which he decided to attack immediately (BG 7.12). The inhabitants had no wish to fight, though, and begged Caesar to spare them. Being pressed for time, Caesar accepted their surrender in exchange for arms, hostages and horses. But just when the inhabitants of Noviodunum had started to accede to Caesar’s demands, they saw Vercingetorix’s cavalry coming up from Gorgobina.¹ With fresh hope at the sight of the leader of the coalition of the Gauls arriving with reinforcements, the inhabitants of Noviodunum changed their minds about surrendering. They closed the gates of the *oppidum* and began to fight, supported by Vercingetorix’s cavalry. The battle raged, but Caesar won the day with the support of his 400 German cavalrymen.

Recent archaeological research has identified a small *oppidum* of about 10 hectares at Neung-sur-Beuvron, within a larger enclosure of 200 ha, which probably marked the boundary of its territory or *pagus* (Figure 9.3) (Krausz 2015). There is an enormous rampart 10 m high at Neung-sur-Beuvron with a large flat-bottomed ditch in front of it. It was probably behind this rampart that the Bituriges of Noviodunum protected themselves against Caesar’s army. The rampart has never been excavated but its shape and height indicate it was a massive dump rampart of the kind found at other *oppida* in the territory of the Bituriges.

Gorgobina, city of the Boii

The impressive promontory of Sancerre towers 168 m above the Loire, a little more than 2 km from the river’s left bank (Figure 9.4). ‘La montagne de Sancerre’, as this prominent hill is called locally, would have made a splendid *oppidum*. But no Iron Age remains have so far been found, nor any trace of a rampart. Numerous historical and philological indications make it very likely that Gorgobina, the *oppidum* of the Boii, was indeed in the Sancerre area (Krausz 2015, 20). The Boii were Celts who originated in Bohemia, and Caesar tells us they were part of the migration of the Helvetii and fought at Bibracte in 58 BC (BG 1.28; Kaenel this volume). After the Helvetii had been defeated, Caesar placed the Boii under the protection of the Aedui, who gave them land within their *civitas*, probably Gorgobina.

A Roman agglomeration was excavated in the 1960s at Saint-Satur, a village next to Sancerre. A series of excavation campaigns have revealed a settlement area beside the Loire at the locality of Saint-Thibault. Moreover, a few years ago archaeologists discovered traces of two Gallo-Roman bridges in the bed of the river, indicating that a major highway crossed the Loire there (Dumont 2011). Re-examination of the 1960s excavation reports has revealed the presence of late Iron Age fibulae and coins among the objects attributed to the Gallo-Roman period. Poorly dated at the time of the excavations, they confirm the existence of a Gaulish settlement beside the Loire. The remains suggest that an agglomeration on the left bank of the river had a port, which might have been controlled by the Boii, probably for the benefit of the Aedui. This discovery suggests it might have been wrong to look for an *oppidum* on the mountain of Sancerre because Gorgobina, the town of the Boii, could well have been a port associated with a lowland *oppidum* at Saint-Satur on the left bank of the Loire.

The siege of Avaricum

After taking the *oppidum* of Noviodunum, Caesar raced directly for Avaricum. He was anxious to subjugate the Bituriges who were a serious threat for Rome at this point in the war. Vercingetorix asked the Bituriges to burn their towns and villages as part of a 'scorched earth' policy to prevent the Roman army from securing supplies. The Bituriges accepted the sacrifice and burnt down more than 20 of their towns with the neighbouring *civitates* doing the same (BG 7.15). But the inhabitants of Avaricum implored Vercingetorix to spare their capital. The leader of the Gauls agreed not to burn Avaricum but the subsequent story shows that he left the Bituriges to deal with Caesar by themselves and made no move to help them during the siege. The siege tied Caesar and his six legions down for 25 days between mid-March and mid-April of the year 52 BC in particularly harsh conditions as it was cold and rained non-stop. Caesar reported that he would have preferred to build a circumvallation around Avaricum and impose a blockade, but it was impossible to do so because the *oppidum* was surrounded by marshland on all sides. Caesar saw only a narrow passage to gain access to the promontory (Figure 9.5). The narrow passageway to the south-east of the *oppidum* probably led to the main gate of Avaricum and Caesar set up his main camp opposite it. This location, now Place Séraucourt in Bourges, is where ditches were discovered in the 19th century that may have been part of the Roman camp (Krausz and Ralston 2009). As he could not build a circumvallation, Caesar decided to build an assault ramp (*agger*) up which two towers could be rolled enabling him to reach the Gallic rampart and enter the city over the top of the fortifications. Caesar gives precise measurements of his assault ramp: 330 feet long and 80 feet high, that is about 100 m long and 24 m high. It was an enormous earthwork that cost the Roman legionaries 25 days of very hard toil not just in the cold and pouring rain but under a constant hail of missiles from the Gauls. But Caesar reports that his men were not discouraged because they thought only of avenging the murders of the Roman traders at Cenabum. The assault ramp should be thought of not as a major monument built to

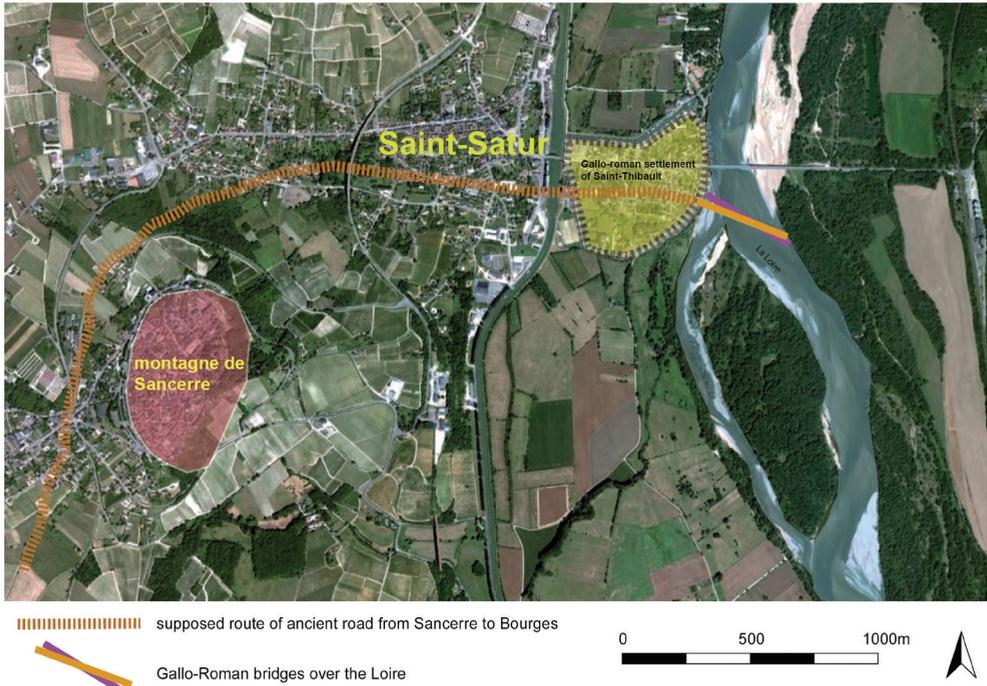


Figure 9.4 Gorgobina: location of the Montagne de Sancerre and the agglomeration of Saint-Satur, Cher (S. Krausz, on © Google Earth background image. Ancient road from Sancerre to Bourges after Chénon 1922, 46; Gallo-Roman bridges after Dumont 2011).

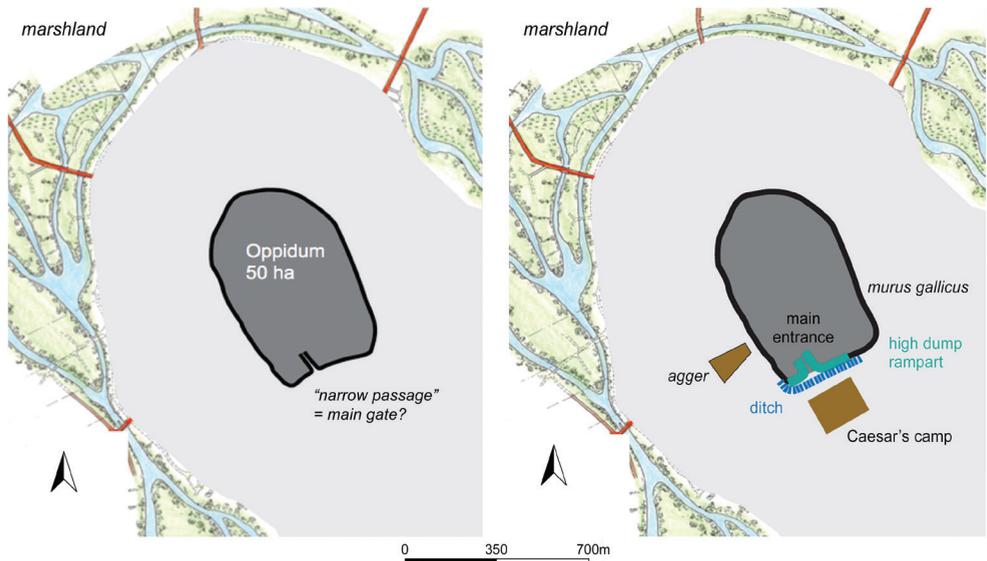


Figure 9.5 Bourges-Avaricum, Cher: sketch plans of the oppidum and the Gaulish fortifications and supposed location of Caesar's siege installations (S. Krausz).

last, as 19th-century scholars described it, but rather as an enormous earthwork made up of a heap of sundry material – earth, stones and probably a wooden framework to make it rigid. The assault ramp can be compared with two other ancient examples that still survive, built as banked up ‘runways’ around a wooden frame: the assault ramp at Masada in Israel built against the Zealots by the Roman general Silva in AD 73 and that of Dura-Europos in Syria built by the Persians in the 3rd century AD (Krausz 2019).

During the 25 days of the siege, the Gauls of Avaricum tried to destroy the Roman siegeworks as they were being erected: they set fire to the assault towers and the sheds that protected the Roman troops on the embankment. At the same time they dug galleries beneath the ramp to make it collapse and they set fire to the wooden frame. Caesar relates in Book 7.14 that the *agger* was smoking. The Gauls forced the Romans to rebuild the ramp several times; they fought hard to try and stave off the fatal outcome of the siege. Of Caesar’s two assault towers, only one eventually reached the rampart. The other was most certainly burned by the Gauls or collapsed because of sapping, but Caesar does not dwell on the matter. One of the upper storeys of the tower must have contained a battering ram to open a breach in the wall. And at the top of the tower, there was probably a boarding bridge that the troops could drop down over the rampart in order to cross into the *oppidum*. Once the legionaries finally managed to enter Avaricum over the top of the ramparts, Caesar had the entire population of the capital slain. No one was spared, not old men, nor women, nor children. Only 800 out of 40,000 are said to have escaped the slaughter.

Despite the many archaeological excavations at Bourges in the last 30 years, no material evidence of the siege has yet been found. This is probably because Roman and then medieval urbanization have removed virtually all traces of the late Iron Age, given that the city of Bourges was extensively redeveloped from the Augustan period onwards. However, it is possible to form some idea of the morphology of the ramparts of Avaricum by comparing the text with archaeological data for the other ramparts of the Bituriges.

The Gallic rampart of Bourges is known from Caesar’s famous description of it at precisely the time of the siege of Avaricum (*BG* 7.23). The Roman general gives details of how Gallic ramparts were built: he calls the rampart a *muris gallicis* and archaeologists have adopted this term to refer to this type of fortification (Figure 9.6), a rampart constructed with wooden beams, held together by large iron nails. It was clad externally with stones among which the ends of the beams were visible, either in rows or staggered in a diamond pattern. The *muris gallicis* was not a very tall rampart, generally measuring 4–6 m high, but could be topped by a wooden parapet or palisade. More often than not there was no ditch in front. Excavations of several examples of the *muris gallicis* in Berry reveal that they were constructed between 100 and 80 BC. These dates indicate that the *muri gallici* were not constructed out of fear of Roman sieges, because the Romans were not a perceived threat at the beginning of the 1st century BC. But, if Caesar is to be believed, it was behind their *muris gallicis* that the Gauls of Avaricum sought to hold out against the Roman army. The Roman general specifies that during the siege, the Gauls raised the height of the *muris*



Figure 9.6 The reconstructed *murus gallicus* at Bibracte, Mont-Beuvray, Nièvre/Saône-et-Loire (photo Antoine Maillier).

gallicus using wooden towers connected by planking to match the growing height of Caesar's own assault towers (BG 7.22). This detail shows that the Gauls were able to rearrange and develop their rampart to make it more effective, even in the thick of the action when under siege.

Although the archaeologists at Bourges have not yet been fortunate enough to see the *murus gallicus* attacked by Caesar, a stout defensive feature was discovered in an excavation in 1987 on the site of Bourges town hall, at the top of rue Moyenne (Krausz 2014). This was an enormous V-shaped ditch, measuring 25 m wide and 10 m deep (Figure 9.7). The amount of material extracted from the ditch indicates it formed part of a massive dump rampart. The archaeological finds confirm that it was backfilled in Augustan times, having been dug in the middle of the 1st century BC and had in all likelihood been in place at the time of the siege in 52 BC.

Close to the narrow passage mentioned by Caesar, the ditch reveals the existence of a gate fortified by a type of rampart that was far taller than a *murus gallicus*. While the *murus gallicus* must have formed an unbroken ring around the *oppidum* of Avaricum, the massive dump rampart formed a barricade protecting the main entrance, consolidating a major weak spot in the narrow passage described by Caesar. Since the 19th century, scholars have presumed that Caesar's assault ramp was built in this narrow passageway between the gate of Avaricum and Caesar's camp

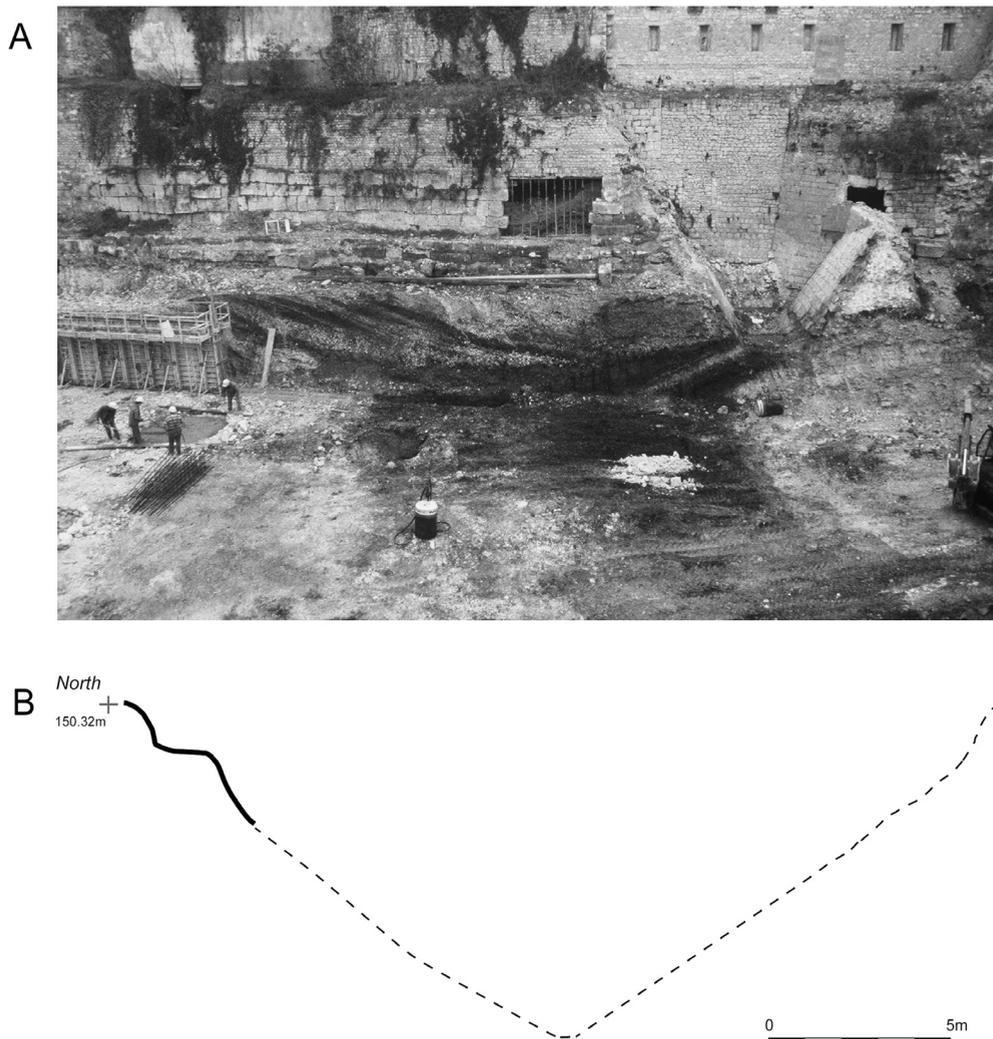


Figure 9.7 Bourges, ditch at the top of rue Moyenne, 1987 excavations by J. Troadec. (A) The upper ditch fills, seen in cross-section during the excavation. (B) Reconstructed ditch profile. Solid line, profile surveyed in 1987; dashed line, projected basal and southern sides (photo J. Troadec, Service archéologique de Bourges Plus; reconstruction S. Krausz).

(Napoléon III 1865; Duruy 1881). But Ian Ralston and I have shown that the ramp could not have been set up at this spot, something that the 19th-century scholars could not have known before the discovery of the big ditch in 1987 (Krausz and Ralston 2009). Caesar did not build his ramp opposite the gate but against one of the curtain walls of the *murus gallicus*. We can be sure of this because he clearly states that the legionaries entered Avaricum over the top of the rampart and not through a gateway (BG 7.27).

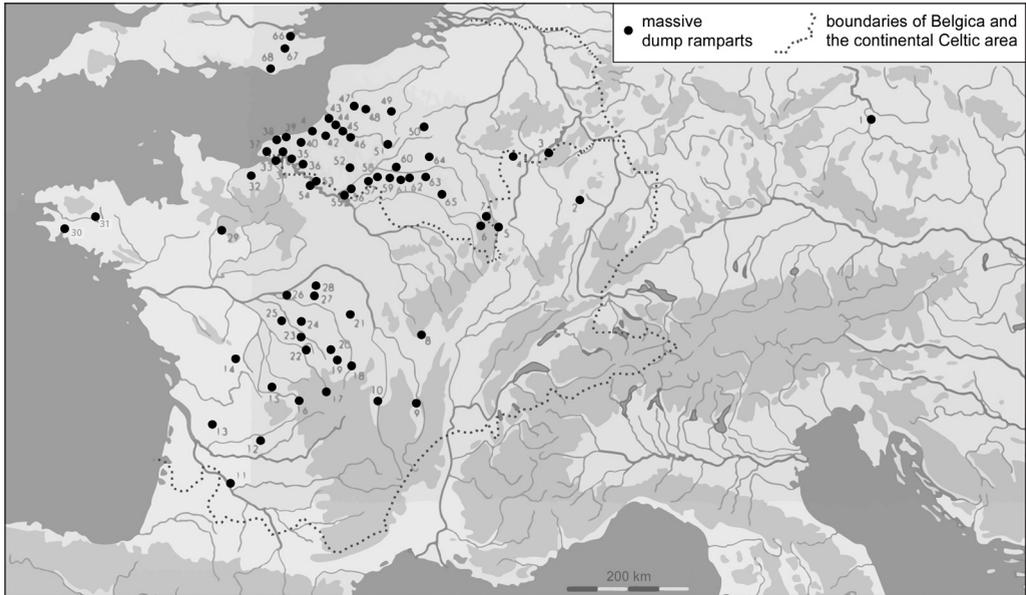


Figure 9.8 Map of massive dump ramparts in France (after Fichtl 2010, fig. 14, with additions).

Although there is no trace of the assault ramp at Avaricum, it might well have been built opposite one of the long sides of the *oppidum*: on the western side, for example, the present-day rue d'Auron has a 20 m rise between its low point in the valley and the top of the promontory. If we add 4 m to this for the average height of a *murus gallicus*, we have 24 m in all. This could explain the height of the assault ramp; the 24 m figure claimed by Caesar does not seem to be an exaggeration.

The massive dump rampart: the ultimate Celtic model

The massive dump rampart was the final model the Gauls invented. This was an embankment of earth or stones with many variants, the archetype being the Fécamp type rampart with a broad flat-bottomed ditch in front of it, defined by Mortimer Wheeler (Wheeler and Richardson 1957; Fichtl 2010). Earth and stone fortifications were common in Britain; they were low but often multivallate, as at Maiden Castle and a string of sites across Normandy inventoried by Wheeler. Ian Ralston (1992, 114) has shown that massive dump ramparts are found throughout Celtic Europe with two main concentrations: one in north-eastern France around the Seine valley and the other in central France (Figure 9.8). The tallest earthworks, some exceeding 10 m, are found in Berry and Limousin in central France (Buchsenschutz *et al.* 2010). Unlike the *murus gallicus* whose defensive function is not always very clear, the massive dump rampart is very much a rampart for war, an emergency fortification. In the territory of the Bituriges, dates for these fortifications centre on the 1st century BC, which means we can associate them with the Gallic War (Krausz 2014).

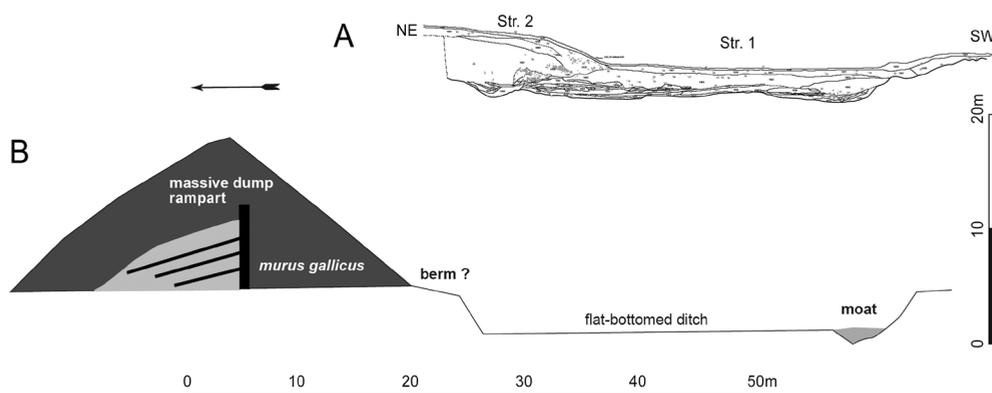


Figure 9.9 Rampart and ditch at Châteaumeillant, Cher. (A) Stratigraphic section of the large flat-bottomed ditch. (B) Reconstruction of the flat-bottomed ditch and ramparts (S. Krausz).

Châteaumeillant's massive dump rampart

Châteaumeillant was another of the principal *oppida* of the Bituriges, at the southern extremity of their territory on the edge of the Massif Central (Figure 9.2). This *oppidum* has the highest preserved rampart in central France, still standing 12 m high in places. It sits on a low promontory that rises to 10 m at most at its southern tip. The Latin name *Mediolanum*, meaning 'in the middle of the plain' or 'the middle plain', may be related to its situation between two near-parallel rivers. The natural promontory covers an area of 60 ha, but the fortification encloses just 24 ha at the southern end of the plateau. The site was excavated in the 19th century, and again from the 1950s until 1984 (Krausz 2009). For my part, I resumed excavations on the Gaulish fortifications and settlement in 2001 and research is ongoing. I present here only the pattern of fortifications and the early results from new excavations in 2018 of the massive dump rampart.

Massive dump ramparts are distinctive in that they combine two inseparable elements: a huge bank and a very large ditch. The bank is usually made up of the material dug out from the ditch; the rampart is therefore the positive counterpart of the excavated ditch. At Châteaumeillant, excavation of the ditch in 2002 revealed that it was 3 m deep, 45 m wide and that it had a flat bottom. The rampart now rises to a height of 10–12 m, but as it has been eroded by agriculture,² it could have been 14 or 15 m high originally (Figure 9.9). A parapet along the top would have added an extra 2 m, so the rampart might have stood 16–17 m high. Unlike stone ramparts, which have vertical or slightly tapered walls, earth ramparts slope distinctly at the front. The angle stabilizes the rampart's outer slope limiting slippage and making it easier to maintain. It also keeps siege machines at a distance, the Roman army's rolling towers being unsuitable for approaching embankments of this kind. Moreover, as it was made of earth, the rampart could not be set on fire or undermined to bring it down. So the classical Roman tactics of sapping,³ firing and using assault towers were

ineffective against this type of rampart. As for the ditch, analysis of its fill shows that it was marshy. Being supplied by one of the two rivers that flowed on either side of the *oppidum*, the ditch could have been wet or muddy for all or part of the year. This marsh would have made it impossible for an approaching army to gauge the depth of the ditch. In addition, a water-filled moat 10 m wide and 4 m deep to the front of the ditch provided an extra obstacle; it too was probably supplied by one of the rivers. This very large defensive ditch would have been a particularly effective impediment not just against siege machinery but also against infantry and cavalry. Even if the attackers managed to cross it, we then have to imagine a wall of earth nearly 16 m high looming over them, or in fact 19 m from the bottom of the ditch.

All the examples of *murus gallicus* ramparts of the main *oppida* in the territory of the Bituriges, as at Châteaumeillant, are covered by massive dump ramparts. This seems to be a systematic and deliberate architectural development to counter Roman siegecraft during the Gallic War. Could the *murus gallicus* have continued to play a part within the massive dump rampart? Its presence would have provided considerable military advantages (Figure 9.10):

- First, there was already a solid core in place, meaning less material had to be moved to form the dump rampart.

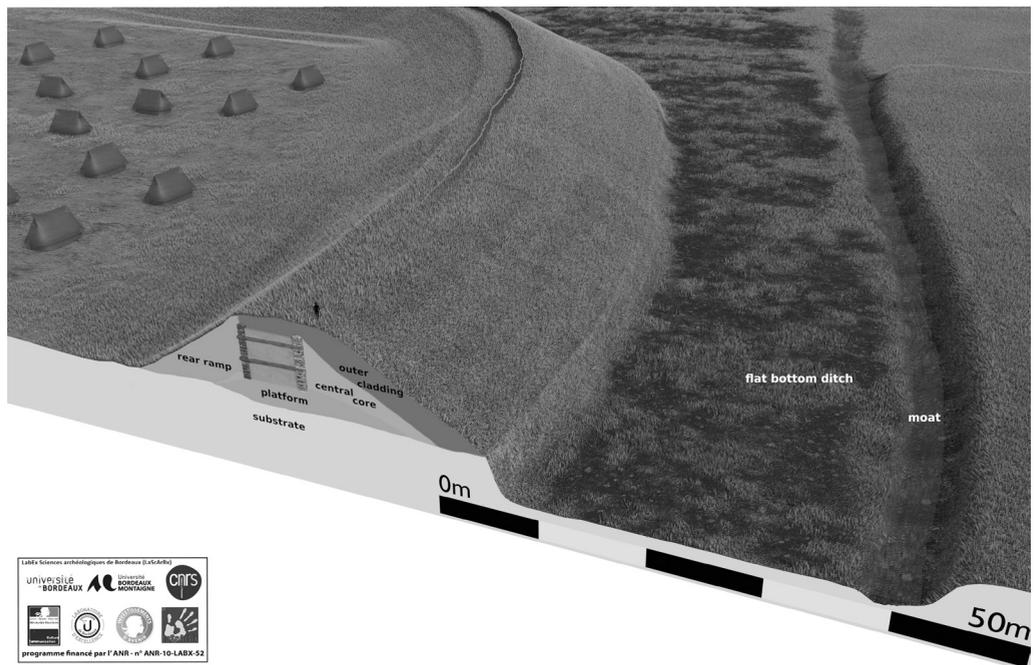


Figure 9.10 3D reconstruction of the fortifications at the oppidum of Châteaumeillant (Florent Comte, UMR5607 Ausonius).

- Next, the massive bank repaired and camouflaged the old ramparts built 50 to 70 years earlier, the beams of which had rotted and the facing slipped away.
- Lastly, from a military perspective, it could be considered that the massive embankment both completed and extended the *murus gallicus*.

The masonry core formed by the *murus gallicus* would have played a key role inside the embankment by solidifying it, which was particularly important for an earth rampart. While the earth embankment could not be set alight, it could be mined,⁴ either at its base or part way up. The masonry core would have formed an effective anti-mining device. Too few massive dump ramparts have been excavated for their exact composition to be understood, whether at the core or on the inner and outer slopes. In most cases, it is not known how the slopes of the bank were constructed, but it is likely they were not just piles of earth. Some examples, such as the rampart at Bibracte and other ramparts in Berry, suggest that the outer slopes of the embankments were covered with cobbles or stones, forming an anti-mining device much like a tortoise shell (Krausz 2018).

The initial results from the summer 2018 excavation of the Châteaumeillant rampart reveal a complex, three-part architecture (Figure 9.11):

- A central core (st.705): a bank of orangey-red clay was built above the *murus gallicus*. This clay derives from the upper layers excavated from the ditch. The bank forms a highly compact and homogenous core; the clay is pure and not mixed with other material.
- The outer cladding (st.706): a series of grey clay layers were placed against the outer part of the central core. Some have varying contents of mica schist that are either crushed or form small pebbles. These clays come from the deeper layers of the Châteaumeillant subsoil. They form a highly compact and dense shell, which I interpret as a sort of external armour-plating forming the defensive part of the rampart. It is hard to penetrate these highly compact layers with digging tools. They are made up of a mixture of various sediments and several sorts of crushed

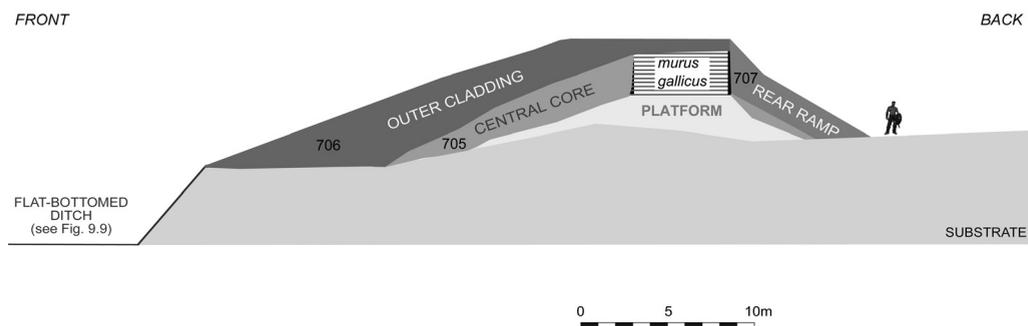


Figure 9.11 The massive dump rampart at Châteaumeillant: Hypothetical reconstruction of the different layers of construction (S. Krausz).

and ground rock; so this is by no means just a heap of earth, but a mixture of carefully selected geological resources customized to provide a material with specific properties.

- The rear ramp (st.707): as at the front, this is an embankment resting against the central core, on the inner side of the *oppidum*. The embankment is made up exclusively of a mass of broken down mica schist and amphibolites that is not mixed with clay, *i.e.* this blue-green layer is made up solely of ground rock. It is compact but seems less dense than the armoured cladding on the outer side. This embankment forms an access ramp to the rear of the rampart, which would have been used for moving around and climbing quickly to the top.

The observations of 2018 show that the massive dump rampart of Châteaumeillant was a complex structure and far more than just a mound of earth. On the contrary, it was a technological construction made up of several components with specific functions, and the outer face in particular seems to have formed a highly elaborate armour plating, the defensive shell of the rampart. The section dug in 2018 seems to show that the monument is perfectly and fully preserved in its initial form. No disturbance or reworking of the fortification has been observed.

The role of the rampart in the Gauls' defensive strategy

To understand the role of their ramparts, the archaeological approach has to be supplemented by analysing the defensive strategy the Gauls implemented. This means returning to Caesar's text, which gives many clues about how the Roman army attacked *oppida* and occasionally mentions how the Gauls defended themselves. Although sparse, Caesar's observations on the Gauls' means of defence can be used to some extent to evaluate the role of the Gallic rampart. During the Gallic War, Caesar employed classic methods familiar to all the generals of the Roman Republic. The legionaries knew how to implement three main tactics by the rules-of-the-art: combat in open country, direct assault and laying siege. The last two were suitable for capturing cities:

- **Storm** (*oppugnatio repentina*) was a quick and sudden method implemented *ex itinere*, that is, immediately after the troops arrived. The legionaries scaled the walls with ladders, archers and slingers drove off the defenders from the top of the ramparts, and the gates were set alight or smashed in.
- **Siege** (*oppugnatio longinqua*) was a protracted affair, implemented when it was not possible to take a city by storm.
- It went along with **investment** (*obsidio*), which consisted of blockading a city with one or more circumvallations to contain the besieged and prevent their resupply or support from outside. Siege warfare was 'mechanized' – battering rams and machinery were made ready, sometimes with a ramp (*agger*) to reach the defences and roll forward the assault towers.

Laying siege was undoubtedly the preferred method of Roman generals because it limited loss of life by keeping men out of hand-to-hand fighting. In some instances, the mere threat of such preparations, with the machinery being demonstrated and ostentatiously paraded, dispensed with any direct confrontation. This happened, for example, with the Senones at Vellaudunum (52 BC, just before Cenabum was taken; *BG* 7.11): Caesar set about building a circumvallation, but after two days' work the Senones surrendered so as to avoid the assault. We saw a similar situation at Noviodunum where the Bituriges were unwilling to fight the Romans. During the Gallic War, fewer cities were stormed than were besieged. There was the storming of Cenabum (Orléans), which Caesar ordered at night by setting fire to the gates. At Gergovia, he abandoned the siege because the topography was unsuitable and he was forced to attempt an assault that failed. Finally, at Alesia, he set up the greatest blockade of his career, a spectacular installation not unlike that at Numantia in Iberia, captured by Scipio Aemilianus in 133 BC (see also Morillo and Sala-Sellés this volume). Roman generals were assisted by military specialists, engineers and architects who advised them on the use of machinery and the calculations for setting out their siegeworks. For example, in the 2nd century BC, Scipio Aemilianus was accompanied by the Greek historian Polybius, a leading specialist in siegecraft, who was at his side at Carthage in 146 BC and Numantia in 133 BC. Caesar might have been accompanied at times during the Gallic War by the famous architect Vitruvius, or by other engineers whose names have not come down to us. Like the Roman army, the Gauls too might have had specialists in military, strategic and technical matters on their general staff. They may well have been members of the elite, able to read Greek and familiar with the theoretical questions in the treatises on siege warfare. It is known that some – including Vercingetorix and Ambiorix king of the Eburones – had had practical experience in the Roman army. Like young Roman noblemen, young Gallic aristocrats were invited to learn the art of warfare in the Roman army alongside famous generals. After such service, they would have had a very precise idea of the defensive strategies that would need to be implemented in the event of an attack on the *oppida* and would not have been taken aback or at a loss when up against the Roman army that they knew well.

In theory, defensive strategy could be passive or active. To be effective a rampart had to be adapted to the chosen form of defence:

- In adopting a passive defence, the besieged stayed back behind the rampart and relied on its solidity. The fortification was designed to resist attack through a combination of the height and width of the rampart, its ditches, towers, defensive gates, firing platforms, and so on. The fortifications did not have posterns as the designers did not anticipate any counter-offensives or sallies.
- In active (to very active) defence, the principle was to attack before being attacked, that is, to seek out the fight so as to control it. The most widely used tactic was the sally, forcing the aggressors to fight outside the city, so keeping them at a distance.

At Avaricum, the Gauls opted for active defence; they sallied out by day and by night and constantly harassed the Romans wherever they were, in order to keep Caesar's army away from the rampart. A final question concerns the connection between the strategy of active defence implemented by the Gauls and the capabilities of their ramparts. In other words, were the Gauls' ramparts specifically designed for active defence? Or was that defensive strategy used in the Gallic War to offset the shortcomings of certain ramparts? Or the shortcomings of certain topographical positions? Or both?

Conclusion

Throughout the Iron Age, the diversity of Gaulish ramparts as perceived through archaeology indicates how dynamic fortification design was. At the end of the Iron Age, the complex technology of the massive dump rampart reveals the capacity of the Gauls to adapt, and attests to their knowledge of classical siegecraft. The complex morphology of their ramparts shows that the Gallic designers mastered not only the principles of architecture but also of mathematics, geometry and even hydraulics. The ditch at Châteaumeillant, that includes a moat supplied by rivers, must have required expert calculations for it to fill up at certain times of the year, or to remain wet at all times. This knowledge of hydraulics was also a feature of Caesar's army, as indicated by the diverting of the springs at Uxellodunum in 51 BC (BG 8.40) and the flooding of the ditches during the siege of Alesia (BG 7.72). Caesar probably applied the recommendations of the handbooks on siege warfare he had read, those of Aeneas Tacticus and Philo of Byzantium, the latter advising – back in the 3rd century BC in his *Poliorketika* – to 'divert the waters that flow into the stronghold'.

If Roman generals were instructed in the theory and practice of Greek siegecraft, it is likely that some Gauls or Celts were too. Their practical knowledge could have been handed down by Celtic mercenaries from Greek and Carthaginian armies; but it may be that young Gallic aristocrats like Vercingetorix, who were later to hold political and military office in their *civitas*, had also garnered such practical and theoretical knowledge at first hand. If we accept that there were specialists in military strategy among the Gauls and more generally among the Celts, as there were in the Greek and Roman armies, it is conceivable that there were engineering corps in the armies of some Gaulish *civitates*. An archaeological clue is provided by the massive dump ramparts of the *oppida* of the Bituriges. The similarities of their design indicate that the ramparts might have been the work of a military section of the *civitas*, capable of coordinating huge engineering works and forming a common front against Caesar by means of a very well-organized strategy of defence.

Notes

- 1 Gorgobina or Gortona was an *oppidum* of the Boii, who were resettled in Aeduan territory after the defeat of Bibracte in 58 BC (BG 7.9). Vercingetorix besieged them early in 52 because the Boii, allies of the Aedui, were called on by Caesar to resupply his army. Was the leader of the Gauls trying to prevent this or to rally the Celtic populations to his coalition?

- 2 The rampart banks were covered with vines until the First World War. Châteaumeillant produces various AOC wines including a grey wine speciality.
- 3 Sapping was a classic Roman technique, consisting of loosening the base of a stone rampart so that it would collapse.
- 4 Like sapping, mining was a standard Roman technique by which one or more galleries (mines) were dug beneath a rampart through which to enter the city.

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