Were the *oppida* sustainable? Examining the persistence and provisioning of Late Iron Age agglomerations in temperate Europe

Manuel Fernández-Götz (University of Oxford), Tom Moore (Durham University) and Ian Ralston (University of Edinburgh)

Abstract

During the last two centuries BC, large fortified settlements known as *oppida* developed across extensive parts of temperate Europe, from France to Hungary and from Spain to Britain. Due to their significant size and socio-economic roles, the *oppida* –or at least most of them– have traditionally been identified as the first towns of pre-Roman temperate Europe. However, research over the last few decades has shown that urban centres had already developed earlier in the Iron Age, both in the form of fortified sites (the so-called 'princely seats') and open agglomerations. Some authors have argued that the *oppida* represented a 'wrong step' towards urbanisation that surpassed the economic potential of Late Iron Age societies, making these settlements destined to fail. Others, contrastingly, envisage the *oppida* as the culmination of urbanisation trajectories in the Iron Age. In this article, we review the question of the sustainability of the *oppida* focusing particularly on settlement persistence (i.e., how long did the *oppida* last) and the provisioning of these centres with foodstuffs and other goods. General reflections are combined with references to selected case studies from Western and Central Europe, challenging some previous notions but also highlighting gaps in our knowledge.

Key words

Urbanisation, Temperate Europe, Iron Age, *Oppida*, Sustainability, Persistence, Provision.

Manuel Fernández-Götz (Manuel.Fernandez-Gotz@arch.ox.ac.uk) is Professor of Later European Prehistory at the University of Oxford. He has published extensively on Iron Age and Roman Europe, conducting fieldwork at sites such as the Heuneburg and Monte Bernorio.

Tom Moore (t.h.moore@durham.ac.uk) is Professor of Archaeology at Durham University. His research focuses on the western European Iron Age, and he has conducted major field projects at Iron Age *oppida* in Britain and France.

Ian Ralston (I.Ralston@ed.ac.uk), formerly Abercromby Professor of Archaeology at Edinburgh University, has researched French *oppida* since the 1970s and excavated the *Porte de Rebout* at Mont Beuvray. His *Atlas of the Hillforts of Britain and Ireland* (with Gary Lock) appeared in 2022.

Introduction

Compared to other parts of the world such as the Near East or the Indus Valley, in temperate Europe urbanisation was a relatively late phenomenon that had its origins mainly in the first millennium BC (Fernández-Götz and Krausse 2016; Fernández-Götz and others 2014; Guichard and others 2000; Sievers and Schönfelder 2012; for a discussion of urban definitions cf. Fernández-Götz 2020; Fernández-Götz and Smith 2024). Traditionally, the

first towns north of the Alps were dated by scholars to the second and first centuries BC (Collis 1984). These sites are known as the Late Iron Age *oppida* (sing. *oppidum*), large fortified settlements that generally developed a few generations before the Roman conquest (Bofinger and Stegmaier 2023; Fernández-Götz 2019; Fichtl 2005; 2012; Moore and others 2023; Rieckhoff and Fichtl 2011). In archaeological literature, the term has been adopted from Julius Caesar's use of it in his account of his conquest of temperate Gaul. Although the importance of the *oppida* for our understanding of pre-Roman Europe continues to be undisputed, research over the last few decades has shown that they were not the first Iron Age towns (Fernández-Götz 2018). Indeed, an earlier phase of incipient urbanisation occurred in the sixth and fifth centuries BC, with the development of the *Fürstensitze* ('princely seats') (Brun and others 2021; Krausse 2008; 2010; Krausse and others 2016; Zamboni and others 2020). In addition, we also need to take into account the importance of the large open agglomerations that started in the third and second centuries BC, many of which have traits that can clearly be characterised as urban (Fichtl and others 2019; Moore and Ponroy 2014; Salač 2009; 2014). In this article, we will focus on the sustainability of the *oppida*, although with occasional references to the *Fürstensitze* and open agglomerations (for wider discussions on urban sustainability, see Fletcher and Fernández-Götz, this issue).

More than 180 *oppida* are known between Atlantic France and Hungary, to which we could add further examples in Britain and central-northern Iberia[1] (Fernández-Götz 2019; Fichtl 2005; 2012) **(Figure 1)**. While the *oppida* do not represent a homogeneous site category, most of them share certain traits such as being surrounded by substantial fortification works and enclosing at least ten ha (with some examples reaching several hundred or even over a thousand hectares). They generally also acted as centres for economic, political, and religious activities. In terms of chronology, the majority of continental *oppida* developed towards the end of the second or beginning of the first centuries BC (see below for a more detailed analysis). Material culture items frequently found at *oppida* include metalwork indicative of large-scale production, wheel-turned pottery, coins, glass objects, and imports from the Mediterranean world, such as Roman amphorae.

<Figure 1 here>

Estimating the population of individual *oppida* is a difficult task considering that few sites have witnessed large-scale investigations which would allow even rough calculations; in addition, there would have been considerable differences in population size between sites and also oscillations during the lifespan of individual settlements. Having said this, it is reasonable to assume that some of the largest examples could have contained several thousand inhabitants, albeit fewer than the numbers cited by Caesar in wartime circumstances. For example, populations of 5000–10,000 have been proposed for Mont Beuvray/*Bibracte* in Burgundy and Manching in Bavaria, two of the best researched *oppida* on the continent (Moore and others 2023). In most instances, the internal occupation of *oppida* appears to have combined areas of relatively high-density settlement, inferred from

[1] It should be noted that this article only covers *oppida* from the so-called Celtic world (cf. Collis 1984; Fichtl 2005). *Oppida* located in parts of Mediterranean Europe such as eastern Spain and southern France are excluded because of their different characteristics.

the densities of structures represented, with others which were characterised by low-density occupation or even empty spaces. Indeed, it has been proposed that the concept of low-density urbanism (Fletcher 2012) may be applied to many Late Iron Age *oppida* (Moore 2017a; 2017b), which included sizeable empty or partially empty areas within the fortifications. In any case, the importance of the *oppida* for Late Iron Age societies derived not only from the scale of their permanent populations, but was more crucially due to the various functions that these sites could have played for the rural populations of their wider hinterlands –from marketplaces to centres for periodic religious celebration, political assembly, or refuge in case of military threat.

There has been considerable debate over whether *oppida* can be considered urban (e.g. Collis 1984; Fichtl 2005; Moore and Fernández-Götz 2022; Woolf 1993), but it is clear that they fulfilled many of the functions of what we might consider towns. As such, it is increasingly clear that discussion concerning the sustainability of the *oppida* has direct relevance to wider debates on how and why major agglomerations and urban centres persisted or declined (see e.g. Fletcher 2019; Kim and McAnany 2023).

While the *oppida* have traditionally been considered as the 'pinnacle' of pre-Roman Iron Age settlement trajectories, in more recent times some authors have taken a different view, arguing that they could instead be seen as an expression of a crisis within temperate European societies (Guichard 2017). Salač (2000) has even proposed that *oppida* located on hilltops represented a 'wrong step' in the urbanisation process, in the sense that their locations were generally inconvenient in economic terms, particularly in relation to agricultural activities. This inefficiency, it is contended, would have made them unsustainable in the long term, as they would have 'surpassed the economic potential of La Tène society' (Salač 2000, 155). According to him: 'The foundation of hilltop *oppida* was a grave systemic error which brought about persistent economic problems to the whole society' (Salač 2014, 74). Most scholars however continue to regard the development of the *oppida* as a further step in the processes of economic and demographic growth, as well as of political centralisation, that took place in the Late Iron Age (Fichtl 2005; 2021; Filet 2021), and which reflected the nature of power at this time. Such a view need not contradict the possibility that the widespread building of fortifications could have been stimulated in part by real or perceived external threats, an issue considered further below. In what follows, we will address the question of the sustainability of the *oppida* focusing particularly on settlement persistence and the provision of these centres recurrently with foodstuffs. While our analysis of the evidence is mainly focused on Gaul, we will occasionally also refer to evidence from *oppida* in other regions.

Settlement persistence: How long did Iron Age agglomerations last?

The study of settlement persistence, i.e., how long did sites last, has been one of the main avenues used by archaeologists engaged in recent discussions around urban sustainability (Fernández-Götz and Smith 2024). Over the last few years, archaeologists have begun to study the persistence of past cities in a more systematic way, asking how long urban sites lasted and trying to account for variations in the longevity of individual settlements (e.g. Crawford and others 2023; Smith and others 2021). Using persistence as a lens can introduce an alternative perspective to traditional collapse narratives, which tend to highlight instances

of failure. Thus, in the case of the Maya cities, instead of putting the main focus on what went wrong that caused them to collapse, recent perspectives ask what they were doing right that enabled them to thrive for centuries in a difficult environment before they succumbed to decline.

In the case of the Late Iron Age *oppida*, analysis of their persistence needs to be placed within the wider framework of the urbanisation processes which took place in the first millennium BC (Fernández-Götz 2018). During the Iron Age of temperate Europe, most agglomerations were relatively short-lived, in the sense that they only lasted for some generations (e.g. less than 200 years in the case of the Heuneburg in Baden-Württemberg). This has led some scholars to speak about 'fragile' or 'delicate' urbanism (e.g. Stoddart 2017). Instead of a gradual development from smaller to larger settlements during the course of the first millennium BC, what has long been observed in some regions of temperate Europe are non-linear trajectories, which included cycles of urbanisation but also deurbanisation (Fernández-Götz 2018; 2020), something that Brun (2016) has characterised as a development which went through repeated peaks and troughs. Comparable cycles of centralisation–decentralisation–centralisation (not necessarily of an urban nature) can be traced back in some European regions to the Bronze Age or even the Neolithic (cf. Müller 2016). In fact, looked at from a global and long-term perspective the non-linear character of urbanisation processes can also be observed in many other periods and parts of the world (Woolf 2020; Yoffee 2015), including the ancient Near East (Liverani 2013), although it is true that in many regions urban centres tended to endure for longer periods than in first millennium BC Europe.

In the case of later prehistoric temperate Europe, a first period of incipient centralisation (perhaps even urbanisation) has been recognised in some regions already during the last stages of the Bronze Age (e.g. at the agglomeration of Corent in the Auvergne region in central France: Milcent 2022; Milcent and Couderc 2021), but this phenomenon was followed by the decline or abandonment of most major centres towards the beginning of the Iron Age. It was not until the late seventh and sixth centuries BC that the start of a new process of large-scale centralisation is detectable north of the Alps, with the initial emergence of the *Fürstensitze*. At least some of these can be classified as towns, with the Heuneburg reaching an area of around 100 ha, Mont Lassois in Burgundy 40–45 ha, and Bourges in Berry at least 200 ha (Krausse 2008; 2010; Krausse and others 2016; Zamboni and others 2020). Even if population estimates are necessarily tentative, it has been suggested that at its zenith Mont Lassois could have held a population of c. 3500–5000 inhabitants (Brun and Chaume 2021) and the Heuneburg around 5000 people (Krausse and others 2019). However, both the Heuneburg and Mont Lassois came to an end around the middle of the fifth century BC. While some other *Fürstensitze* continued to flourish for a generation or two, by around 400 BC all of them had been either destroyed or were otherwise largely abandoned or in marked decline **(Figure 2)**. The reasons for their relatively ephemeral existence have been much debated and are still difficult to elucidate, although it seems likely that social tensions derived from increased scalar stress may have provoked the process of decentralisation (Fernández-Götz 2020). In some cases, this tendency was probably exacerbated by climatic changes (Brun and Ruby 2008; Sirocko 2009).

<Figure 2 here>

In large parts of temperate Europe, a new trend towards urbanisation can be recognised beginning in the third century BC and then becoming more widespread in the following century (Filet 2021; Kaenel 2006). Settlement nucleation took place primarily in the form of open agglomerations, stretching from Western to Central Europe, and including sites such as Aulnat-Gandaillat and Levroux-les-Arènes in France, Basel Gasfabrik in Switzerland, Neubau bei Linz and Roseldorf in Austria, Berching-Pollanten in Germany, and Lovosice and Němčice in Czechia (Augstein 2006; Fichtl 2013; 2021; Fichtl and others 2019; Salač 2014). Several open agglomerations demonstrably covered several dozen hectares, with a few reaching up to around 100 ha or even more. The open agglomerations concentrated significant populations and fulfilled important economic roles, with many of them providing substantial evidence for trade and craft activities such as coin minting, glass manufacture, and large-scale production of metal objects and wheel-turned pottery. Increasingly, there is also evidence for sanctuaries at several of these sites. Although some of the open agglomerations were partially delimited by a stockade or symbolic demarcation, they did not exhibit any formal fortification, which suggests that defensive considerations did not play a major role in their development. The emergence of these open agglomerations was a constituent of broader trends in demographic growth, matched by increasing agricultural and artisanal production, and flourishing trade which took place across large sections of temperate Europe from the third century BC (Collis 2016; Fichtl 2021; Filet 2017; 2021; Kaenel 2006; Malrain 2023), attributable to a combination of endogenous factors and increasing contacts with the Mediterranean world.

Once the *oppida* were established from the late second and earlier first centuries BC, there were multiple scenarios in terms of what happened to these open agglomerations (Fernández-Götz 2019; Fichtl 2005; 2021; Moore and Ponroy 2014). In some cases, the abandonment of a low-lying open agglomeration coincided with the establishment of a new settlement on a nearby hill, sometimes with a temporary overlap before the open settlement was definitively deserted. In other cases, however, the open agglomeration continued to exist despite the foundation of a nearby *oppidum*. There are also instances in which a pre-existing open agglomeration was at some point fortified with an enclosing wall, as happened at Manching. Finally, there are even examples of the foundation of a new open agglomeration in the immediate vicinity of an already existing *oppidum*, as appears to be the case at Sources de l'Yonne near Mont Beuvray (Moore and others 2013). Thus, research over the last few decades has identified multiple pathways in the development of temperate European urbanisation, contrasting with previously suggested unidirectional trajectories. This heterogeneity directly affects the question of settlement persistence, meaning that there is considerable variability in the lifespans of Late Iron Age open agglomerations: some of them lasted for over two centuries, whereas others were only occupied for two or three generations (Fichtl and others 2019). An occupation confirmed as extending between one and two centuries seems to be typical for a significant number of these settlements, although numerous uncertainties remain due to the generally restricted nature of archaeological investigation of these sites, combined with the later inhabitation of many of their locations.

While some *oppida* in Iberia and Bohemia seem to have begun to develop earlier than the last decades of the second century BC, the majority of temperate continental European *oppida* appeared between 130/120 BC and 80 BC (Fichtl 2021; Krausz 2021). Chronological resolution of the duration of use however remains a challenge at many very partially examined sites, and it is not surprising that those *oppida* which have been investigated more intensively are generally those for which we have more precise and secure occupation dates **(Figure 3)**. The chronological ranges proposed for these sites (as well as for the *Fürstensitze* and open agglomerations) rely mainly on the cross-dating of artefacts, with objects such as brooches and imported amphorae representing key indicators. Radiocarbon dates, long considered to be too imprecise for this timespan, are still relatively scarce, and Bayesian modelling even more rare. In some exceptional cases we have dendrochronological dates for the building of certain fortifications, allowing high-resolution insights, for example *c.* 114–112 BC for the first phase of the *murus gallicus* at Metz/*Divodurum* in Lorraine, but that level of precision is certainly unusual. In any case, it seems that –comparable to what was reported above for the open agglomerations– there is great variability in the occupation spans of the *oppida*, with some of them apparently being in use for only a few decades (e.g. Villeneuve-Saint-Germain in Picardy and Gondole in Auvergne) whereas others were inhabited for around a hundred years or more (e.g. *Bibracte*, or Závist in Bohemia). There are also sites that developed more or less continuously into the Roman period and beyond (e.g. Metz, or Besançon/*Vesontio* in Franche-Comté). The question of the persistence of the *oppida* will be broached further in the final sections of this article.

<Figure 3 here>

It is important to emphasise that the processes of Late Iron Age urbanisation clearly preceded the horizon marked by the foundation of the *oppida*, as can be seen in the wide distribution of the open agglomerations that developed from the third and early second centuries BC (Filet 2021; Fichtl and others 2019). Why, then, did nearly 200 large fortified centres appear across continental temperate Europe within just a few decades? Fortified sites already had, of course, a long, if interrupted trajectory of construction and use during later temperate European prehistory (Ralston 2013); however, the fact that so many large enclosed sites were created, mostly within two generations, remains remarkable. The reasons have been much debated, in particular the role of external factors. It is likely that the widespread building of new fortifications was, at least in part, linked to the real or perceived threats resulting from the expansion of the late Roman Republic (marked by the annexation of southern Gaul in the 120s BC), on the one hand, and the historically documented migrations of the *Cimbri* and *Teutones*, on the other (Krausz 2021; 2023; Moret 2018). Numbers of continental *oppida* seem to have been founded *de novo*, potentially as a result of deliberate decisions directed by the socio-political elites (Buchsenschutz and Ralston 2012). In this context, it is possible that in areas of the west such as much of temperate Gaul certain elites instrumentalised fears such as the aforementioned threats to bring together populations within enclosed places which they could control. In turn, this could have triggered emulation among other groups, with elaborate fortifications becoming symbols of prestige and community identity as well as of control. In her influential writings on modern politics, Klein (2007; 2017) argued that governments often

use crises ‘to ram through policies that would never have been feasible in normal times’ (Klein 2017, 13). *Mutatis mutandis*, it is possible to envisage a similar instrumentalisation by Late Iron Age elites to relocate and control populations with the foundation of the *oppida*, thus enabling a more hierarchical and centralising ideology to be articulated (Fernández-Götz 2014b; Rieckhoff 2014).

Feeding the *oppida*: Consumers or producers?

A key issue concerning all forms of large agglomeration that emerged in the Iron Age, and one which has implications for assessing their sustainability, is the nature of their food supply. For some ancient urban centres, reliance on a rural hinterland to supply food to a more specialised population was paramount (Woolf 2020). However, the boundaries between urban centre and rural hinterland were often blurred. Comparative global studies emphasise that urban dwellers were often farmers (e.g. Cowgill 2004; Storey 2006), and concepts of rurbanism and low-density urbanism stress that some agglomerations could be largely self-sustaining (Fletcher 2019; Moore and Fernández-Götz 2022). Nevertheless, the question of food production and supply remains essential for assessing the sustainability and resilience of Iron Age agglomerations, as well as their place in wider social and economic networks.

Examination of this topic is underpinned by debates about what were the driving factors for choosing the locations of the *oppida*: was it proximity to natural resources, defensive advantages, symbolic locales, or their positions on routeways? While there could be a combination of factors, the importance allocated to them may have overridden the selection of sites that allowed access to highly productive farmland (Collis 1984; Salač 2012; 2014). The upland settings of many *oppida* meant they were often situated in climatically and/or pedologically unfavourable locations for agriculture, leading Salač (2009; 2014) to consider them as always unsustainable. Such perspectives have also emphasised the seeming economic fragility of *oppida* that were distanced from what seem likely to have been the main routeways, in contrast to both the preceding low-lying open agglomerations and succeeding Roman towns, which often appear better positioned to access long-distance exchange routes.

Similarly to earlier periods, the later first millennium BC in temperate Europe continued to be characterised by its predominantly rural nature. Despite the emergence of some urban centres, the majority of the population still lived in small, often enclosed, farmsteads and hamlets (Bradley and others 2016; Cowley and others 2019; Malrain 2023; Malrain and others 2002). The need to assess the hinterlands of *oppida* to determine the relationships between such rural communities and *oppida* has long been recognised (Collis 1984), although detailed appreciation of the environs of many *oppida* has remained limited (Moore and others 2013).

Evidence from the earlier Iron Age phase of agglomerations in the sixth and fifth centuries BC indicates that at the Heuneburg some inhabitants farmed the immediate hinterland, but it also suggests that at least this major settlement was unlikely to have been self-sufficient in food supply, with importation from the wider environs (Rösch and Fischer 2016). The open agglomerations that emerged in the third and second centuries BC, although marking a phase of increased centralisation of production and exchange, generally appear to have chosen agriculturally favourable locations (Fichtl and others 2019; Salač 2012). Indeed, a few of these agglomerations, such as Acy-Romance in northern France, were perhaps predominantly agricultural settlements (Lambot and Méniel 1992). Even at the more specialised centres in

which craft production played a major role, evidence for agriculture and a location in fertile plains suggest the potential for significant agricultural production (Salač 2012); although some, such as Aulnat-Gandaillat in the Auvergne (Deberge and others 2019) or Roseldorf in Austria (Holzer 2014), appear to have been consuming produce from rural settlements.

<Figure 4 here>

The *oppida* present a more varied picture. Since Paschinger's (1950) study of the environs of the Magdalensberg (Carinthia), it has been suggested that the landscapes of reduced agricultural potential in which a significant number of *oppida* were situated would indicate that they must have relied on imported foodstuffs (Salač 2012). However, despite their large size, at least some *oppida* appear not to have been simply consumers of produce from a hinterland of rural settlements. Thus, in Bohemia, the apparent absence or at least scarcity of rural settlements within the direct environs of most *oppida* suggests that communities at these major sites controlled and farmed their immediate hinterlands (Danielisová 2014; Danielisová and others 2015) **(Figure 4)**. A similar picture has been suggested for the 170 ha *oppidum* at Vieux-Reims at Condé-sur-Suippe/Variscourt in Picardy (Haselgrove 1996), where the internal organisation of small enclosures appears to replicate the form of rural farmsteads, suggesting the nucleation of the rural population (Pion 2010) and that they continued to operate as semi-independent farming units (Moore and Fernández-Götz 2022). This need not mean these communities were entirely self-sufficient; the presence of imported ceramics (Haselgrove 1996) indicates such *oppida* were integrated into wider socio-economic networks and some foodstuffs may have come from farther afield, but it implies they could largely sustain themselves **(Figure 5)**.

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Assessments of arable processing assemblages have, in the past, been used to suggest some *oppida* in Britain, such as Stanwick in North Yorkshire, were largely consumers supplied by rural hinterlands (Jones 1996). It has since been recognised that such a picture reflects a bias created by taphonomic processes. Instead, there is significant evidence from Stanwick that the community was producing and processing arable crops (Van der Veen 2016). Analysis of the arable weed assemblage at Silchester in Hampshire also indicates a reliance on crops grown within the immediate landscape, suggesting a significant proportion of Silchester's community farmed its hinterland (Lodwick 2018a; 2019). The layout of Silchester, including a discrete household compound in Insula IX (Fulford and others 2018), might suggest some similarities with Vieux-Reims. The compound seems to have been home both to traders and a community of semi-independent farmers (Fulford 2018; Lodwick 2018a). The above reflections are supported by evidence for crop-processing from areas within these *oppida* that are sometimes considered as high-status occupation, including the Insula IX compound at Silchester (Lodwick 2018b) and the Tofts at Stanwick (Haselgrove 2016). This reinforces Collis's (2000) observation that being high status and practicing farming may not have been mutually exclusive in Iron Age society (see also Danielisová 2014).

The suitability of landscapes for cattle around some *oppida*, as at Manching (Wendling 2013), and the faunal assemblages recovered at others (e.g. Foucras 2012; Ruby and Auxiette 2010), indicate that livestock were an important element of their subsistence strategies. The form of some complexes, with droveways and paddocks, suggests a role for corralling and managing livestock, particularly in southern Britain (Moore 2012), although to what extent this was livestock brought from a distance or raised locally is harder to determine. At some sites in France the large-scale butchery of cattle may include both the provision of foodstuffs and processing for other purposes, including perhaps ritual sacrifice (Foucras 2012; Ruby and Auxiette 2010). Comparison between sites in the Auvergne, France, most notably the earlier open agglomeration at Aulnat-Gandaillat and the nearby *oppida* of *Gergovia*, Gondole, and Corent, revealed that faunal consumption patterns, although complex, remained similar between these settlements, perhaps suggesting that the move to enclosed *oppida* did not mark a major change in livestock management (Foucras 2012). Some detailed overviews point to how complex and varied the rearing of livestock and processing of carcasses could be, even between *oppida* in the same region, as is apparent in the territory of the *Suessiones* and *Remi* in north-eastern Gaul (Paris 2016, 2017) and more widely in north-east France (e.g. Auxiette and Hachem 2021, Appendices 19–22). Although specialised buildings to hold livestock, most likely cattle, do occur there (as in one sector of Villeneuve-Saint-Germain), they remain rare. The sophistication of stock-raising regimes is suggested by various indicators. These include evidence of standardisation of butchery practices, different quantities of animal body parts represented on some sites (e.g. few ribs and more hind quarters), the substantial quantities of meat and other primary products represented at certain sites by the recovery of butchered animal bones, and evidence for different sizes of cattle indicating selective breeding likely drawing on imported stock from the south. Suggestions that some of the open areas at Vieux-Reims were used for specialist butchery (Paris 2016), perhaps organised at a neighbourhood level, also emphasise the complex food supply systems which existed at many *oppida*.

Assessments of the origins of the animals found at *oppida* using isotopic analyses are few, although there are hints from some studies that animals were sometimes brought from significant distances (e.g. Moore 2020). Evidence from the ‘royal site’ of Navan Fort/*Emain Macha* in the north of Ireland, dating to the first century BC, a complex which shares some affinities with *oppida*, has revealed animals (including pig) were brought from significant distances, probably as part of periodic feasting events (Madgwick and others 2019). Similarly, isotopic analysis of animals from one of the best studied Early Iron Age agglomerations, the Heuneburg, indicates that during its most densely occupied period in the sixth century BC, some animals were brought from as far as 80–100 km away (Stephan 2016). We might expect similar evidence from many Late Iron Age *oppida*. The results from Navan Fort remind us, however, that animal bone assemblages might sometimes be related to periodic feasting events associated with short-term periods of assembly, rather than the sustained feeding of resident populations. A similar reflection can be proposed for the large quantities of animal bones found within the public space at the *oppidum* of Titelberg in Luxembourg, which were primarily linked to the celebration of fairs in association with political assemblies and religious ceremonies (Metzler and others 2016).

Farming in their bounds?

Characteristic of many *oppida* is their low-density use of space which may have been partly driven by the inclusion of farming within their enclosed areas (Moore 2017a; 2017b). Something along these lines has been suggested for the relatively large open areas at the *oppidum* of Moulay, for example (Le Goff and Moreau 2012). Goláňová (2023) has rightly pointed out that we should be wary of automatically assuming that spaces lacking obvious structural elements within *oppida* represented open areas in the past or inferring that these equated with their use for horticulture or agriculture. It is also possible that such open areas had multifunctional roles, including the corralling of animals, artisanal activities, periodic feasting events, and even large-scale assemblies (Fernández-Götz 2014a; Moore 2012, 2020). This lack of dense occupation in some internal areas, and the concomitant environmental evidence at some *oppida* such as Silchester, have also been argued to indicate that certain *oppida* may have been seasonally occupied –at least in their earliest phases (Fulford and others 2018; cf. Goláňová 2023 for Mont Beuvray/*Bibracte*)– or had very small populations which only swelled at certain times of the year (Moore 2020). Both situations would indicate little need for a significant external food supply to sustain them.

Where surveys have been undertaken within the dispersed, polyfocal complexes in Britain, there is little evidence within the open areas for built structures, raising the possibility that many of these spaces had roles in farming and livestock management (Moore 2020). In a few cases, for example at *Camulodunum* in Essex, these areas include evidence for Late Iron Age field systems confirming some level of farming within the complex (Truscoe 2021). Similar implications have been suggested for the apparently open areas within some of the very large *oppida* in continental Europe, such as the Heidengraben bei Grabenstetten in Baden-Württemberg (Ade and others 2012). Moreover, evidence for farming within the enclosures of those *oppida* that likely had larger resident populations also seems likely. Within the 380 ha of the *oppidum* of Manching, despite a relatively densely occupied core, open areas towards its southern and northern peripheries have been suggested as evidence of agriculture taking place within the walls (Brestel 2019; Wendling 2023) **(Figure 6)**; this is supported by environmental evidence (Küster 2013). Whether a situation such as at Vieux-Reims existed, with the nucleation of the rural population inside Manching, is less clear (Wendling 2023), but in any case, it seems that a proportion of the population of sites such as Manching remained farmers.

While supplying food to *oppida* with small populations may have been less problematic, providing resources to the population of the large *oppidum* of *Bibracte* presents a more complex conundrum. By the late first century BC, this main centre of the *Aedui* encompassed 135 ha on Mont Beuvray; there was an additional agglomeration located a few kilometres away at Sources de l'Yonne which extended to *c.* 100 ha. Although not all of this area was necessarily densely occupied, these two settlements may have represented a combined population of c. 10,000 people (Moore 2017a). The location of the *oppidum* in the Morvan hills, its summit at *c.* 800 m above sea level and on relatively acidic soils, does not provide the most promising of arable landscapes. Examination of the occupation evidence from Mont Beuvray, although identifying a number of open areas, suggests relatively little was used for farming (Goláňová 2023). Weed assemblages and pollen records indicate, however, that despite its relatively unfavourable location, some farming was conducted in the immediate

environs (Goláňová 2023; Jouffroy-Bapicot and others 2013). Yet, it seems unlikely that this was sufficient to supply all its needs, with paleoenvironmental evidence suggesting the importation of some crops from farther afield by the end of the first century BC (Goláňová 2023; Petrík and others 2021; Wiethold 2011). This coincides in other regions with evidence of extensification of crop production, which may reflect the need to supply increasing populations within the *oppida* (Auxiette and Hachem 2021).

<Figure 6 here>

Since Caesar's account, for example of his capture of *Avaricum* of the Bituriges in 52 BC, it has been clear that storage in bulk of foodstuffs within *oppida* was a feature of at least some of them. He reported that, once victorious, he was able to seize 'an immense quantity of corn and all other supplies' there, which was particularly important to reprovision his army in early spring (*BG* VII, 32). This raises significant questions about how the importation and supply of food, especially grain, were managed. The suggestion that grain storage was centralised at the *oppida* remains debatable. Numerous structures at Manching have been interpreted as granaries, indicating the storage of cereals most likely produced in the local environs (Winger 2015), and some possible evidence for (perhaps communal) granary structures have been identified at *Bibracte* (Goláňová 2023). Many *oppida* contain structural evidence for food storage, such as above-ground four- or six-post timber granaries, storage pits, or cellars. Some unusual features, like those at Le Chappe might also be for specific forms of food storage (Bocquillon and others 2021). These often tend to be distributed throughout the sites, however, suggesting that this activity was not centrally-controlled. The association of cellars with craftworking structures at *Bibracte* and in the extra-mural occupation at Gondole (Deberge and others 2009) may also suggest food storage remained at the household level, even for those engaged in specialist activities.
For the earlier phase of the *Fürstensitze*, there is evidence of dedicated areas for food storage at some sites such as Mont Lassois, where they have been identified on both the upper plateau itself and in the nearby lowlands (Chaume 2020). The most spectacular evidence of this kind can be found at the fifth century BC site of the Ehrenbürg in Bavaria, where thousands of storage pits dug into the bedrock have been identified during excavations and geophysical surveys (Abels 2005; 2010).

Economic supply and sustainability

In the model proposed by Salač (2012; 2014) it is assumed that an unsustainable food supply led to inevitable pressure on the viability of upland *oppida*, which in due course led to their abandonment. Taking a more technological approach, Chaume (2020) has suggested that the centres of the mid-first millennium BC could not be sustained because they did not have the organisational capacity, stemming in part from a lack of writing, to manage the food supply necessary for truly urban-scale agglomerations. While potentially a problem at some complexes, it seems unlikely that failures in the provisioning of these sizeable centres of population with foodstuffs represent the overarching explanation for the decline of both sets of sites. For some *oppida* such as *Bibracte*, there is little evidence that a lack of resources was putting pressure on the population in its latest phase, with the complex growing in scale and

intensity in the decades after the Caesarian conquest of Gaul. The move in the Augustan period to the new town at Autun/*Augustodunum* in the Arroux Valley seems to have been more of a political decision, one related to economic choices driven by the nature of Roman urbanism, than failure of the hilltop site due to specific problems regarding the sustainability of *Bibracte*'s food supply (Moore and others 2023) **(Figure 7)**.

<Figure 7 here>

For many *oppida*, despite evidence for parts of the community having more specialist roles, much of the population continued to be involved to a greater or lesser degree in agricultural production. Our understanding of the nature of food supply and the environmental context of the *oppida* remains too limited, however, to be able fully to address their sustainability. We need more detailed appreciations of the nature of the settlement and environmental uses of both the *oppida* themselves (cf. Ledger and others 2015) and their hinterlands to determine the presence of farming supply, while also requiring higher chronological precision to appreciate how this intersected with periods of dense occupation (Goláňová 2023) or nucleation (Collis 1984). It remains essential to undertake detailed assessment of the seemingly open spaces at many *oppida*, with the evidence from Manching (Wendling 2023) and *Bibracte* (Goláňová 2023) demonstrating the value of detailed, multi-methodological assessments. The potential of isotopic studies to provide evidence on animal movement also remains under exploited. Studies from other Iron Age settlements, including the Heuneburg (Krausse and others 2016) and hillforts like Danebury in Hampshire (Hamilton and others 2019), indicate that the movement of animals was widely embedded in networks of exchange across much of the first millennium BC, suggesting *oppida* might have participated in similar processes.

Questions of sustainability also relate to the role of *oppida* as economic hubs. It has often been suggested that one of their prime roles was to control trade (Cunliffe 1988; Fichtl 2005; Wells 1984). Were this to have been the case, then if individual *oppida* were bypassed by new trade routes, this would inevitably lead to their collapse, as has been argued for Manching. For Salač (2012; 2014) this represented another reason why hilltop *oppida*, situated away from direct access to routeways, declined. This would have contrasted with the open agglomerations and lowland *oppida*, which in numerous instances were positioned with access to long-distance exchange networks (Fichtl and others 2019), often at important river crossings or other nodal points in the landscape. This geographical advantage would have decisively contributed to their persistence, many becoming Roman towns and some continuing as urban centres today, as discussed below.

Nevertheless, the extent to which the emergence of the *oppida*, and thereafter their primary role, was as economic centres remains contentious, and of course may have changed over time. Many *oppida* were certainly engaged in long-distance exchange, both with other Iron Age communities and the expanding Roman state (Buchsenschutz 2004; Fichtl 2021; Filet 2021). The location of Manching, for example, is often explained by its positioning on an affluent of the River Danube allowing long-distance trade and by its proximity to natural resources, such as bog ore (Wendling 2013; 2023). The presence of amphorae and slave chains around the large central structure within it may also imply a role in exchange

(Schönfelder 2015; Wendling 2018). At some *oppida* in Gaul, such as Corent and *Bibracte*, the importation of amphorae from Italy was on an enormous scale (Poux 2004; 2012), reinforcing evidence from classical texts that *oppida* served as markets for exchange (Fichtl 2005). It should be taken into account, nonetheless, that the wine contained in the amphorae may have been consumed at *oppida* primarily in relation to ritual, feasting, and funerary practices (Poux 2004; 2012). A similar role as loci for exchange has been proposed for many *oppida* in southern Britain (Cunliffe 1988), even though the small quantities of imports and lack of evidence for trickle down to rural communities perhaps denote the arrival of exotica as part of diplomatic relationships rather than a focus on trade (Hill 2007).

The level of specialisation apparent at some *oppida* also implies that craftworking and proximity to natural resources related to the control of production (e.g. metal ores) could be important (Collis 1984; Wells 1984). Significant craft working areas in many *oppida*, for example *Bibracte*, also indicate that some *oppida* were centres for regional production of specialist materials (e.g. fibulae, glass bangles), turning out standardised products which reflected the artisanal roles of the earlier (and indeed contemporary) open agglomerations (Fichtl and others 2019). To what extent this was crucial to their survival is less clear. Many recent studies emphasise that rather than trade being their primary function, the main motivation behind the creation of the *oppida*, and their subsequent core role, was to be as places of social assembly and political control (Fernández-Götz 2014a; 2014b; Moore 2017a; Rieckhoff 2014; 2021; Salač 2014). Even if their roles as exchange centres were important, if the choice of locations was largely driven by an oligarchic elite (Buchsenschutz and Ralston 2012) then supply and sustainability might have related more to political success than to economic or agricultural resilience (Rieckhoff 2021). Such choices may have been as much about visibility in the landscape, connections to past centres of social or symbolic power (Moore 2017a), and defensive capabilities (Krausz 2023). Some were plainly more successful and more enduring than others. There are anthropological examples of urban centres that appear illogically located to a modern Western eye, and at which the location of production and exchange was as much dictated by ritual propitiousness as access to resources (McIntosh 1999). Even at *oppida* that may have been largely self-sustaining, like Vieux-Reims, its relatively short-lived occupation may have related to tensions in the community or shifting political powerbases (Moore 2017a), perhaps explaining the complex pattern of the relocation of *oppida* in this region over time (Pion 2010; Bradley and others 2016).

Divergent trajectories: The afterlife of the *oppida*

In comparison to the attention directed at the emergence of the *oppida*, their demise or, alternatively, continuation over succeeding centuries has attracted less attention. While the longer-term sustainability and evolution of individual sites has long been a focus of research, less has been written by way of generalisation about them (but see Buchsenschutz 2004). Here, our main geographical focus will be on temperate Gaul, which has been selected amongst other reasons because of the short-lived horizon represented by the relative rapidity of its conquest by Caesar's Roman armies (58–51 BC), followed approximately one generation later by its administrative consolidation under Emperor Augustus, progressively over the decades from 27 BC. Other significant factors conditioning this choice are that some of these Gallic sites have been researched archaeologically since the third quarter of the

nineteenth century and therefore provide the most detailed evidence for understanding their occupation. A much newer dimension of their investigation has been the examination over recent decades of present-day urban centres: this has in some instances literally unearthed their Iron Age beginnings, on occasion only in keyhole exposures, but sometimes more extensively (e.g. Buchsenschutz and others 2009). The existence of contemporary historical records, most celebratedly Julius Caesar's *de Bello Gallico*, also enriches our comprehension. This approach allows the record from *oppida* with very different site biographies to be compared. Some were, over relatively short timescales, failures that were partly or wholly abandoned and thus now survive as monuments in the countryside. In other cases, more enduring usage has resulted in the surviving evidence being interred at depth within accumulating, but not necessarily continuous, settlement stratifications.

In the centuries succeeding the zenith of the *oppida*, the main technologies of movement and communication –horses, wheeled vehicles with animal traction, boats suitable for river use, coastal cabotage, and more– remained largely unchanged. While the road system and ancillary equipment such as bridging developed considerably in the Early Roman period, significant elements of it already existed in the Late Iron Age (Kasprzyk and Nouvel 2011). The fundamental change underway by the end of the first century BC was thus not related to new technologies or communication systems, but rather the incorporation of the *oppida* and the political and economic systems of which they were part into the Roman Empire. This provoked a consequent reorientation in terms of power relations and economic activities, notably with the Imperial core to the south. Impacts on the local provisioning of sites from their immediate hinterlands and wider exchange networks may have been less marked across this politico-economic divide than the radical alterations to such wider-scale geopolitical considerations then underway.

As is made clear above, not all *oppida* fulfilled the same functions, rendering more complex the assessment of their aftermath. Examples vary quite considerably in their extents and topographic settings. Their implantation extended from upland limestone plateaux largely devoid of accessible water and with strong natural defences, to low-lying places adjacent to river or coastal waters. An example of the former is the upland *oppidum* of Puy d'Issolud in Lot: although it was the scene of an important siege in 51 BC (Girault 2013), little evidence of Late Iron Age permanent occupation has been recovered at the site, which may have served essentially as a refuge (Buchsenschutz 2014). Lowland, river-margin settings such as *Lutetia* (Paris) on its island in the River Seine or *Cenabum* (Orléans) beside the River Loire are at the opposite end of the scale. The availability of agricultural and other resources in their immediate hinterlands could also be very different. The relatively rapid insertion of *oppida* over a couple of generations into already-settled landscapes with established properties already in place may have contributed to numbers being constructed in agriculturally-less-favoured upland areas. Some *oppida* may have been components of polyfocal systems, only ever being intended for a specific function complemented by different usages located in other *oppida* or domestic sites within a particular area, as proposed for the grouping Corent-Gergovie-Gondole in the Auvergne (Poux 2014; Poux and Cerisay 2023). In this instance, Corent was to prove the most enduring of the three *oppida*, continuing to be a focus of settlement in Gallo-Roman times.

Several trajectories for the demise or continuation of individual *oppida* are therefore apparent. Only rarely, however, are such processes in temperate Gaul the arrested culmination –as in the final phase at Paule in Brittany (Menez 2020) – of a seemingly long and uninterrupted development of settlement and associated activities at a given location. The development and zenith of some *oppida* were, contrastingly, to be measured in terms of a few decades of use; and such shorter principal occupations, perhaps of 4 ± 2 generations, seem to have been more usual (Fichtl 2021).

The end of the Iron Age, Caesar's military conquest, and the succeeding decades of Roman political consolidation demonstrate rapid changes which likely progressed at uneven rates across Gaul (Reddé 2022). We even have a few cases in which the occupation of an *oppidum* seems to have already gone into a marked decline before the time of the Roman conquest. Thus, the above-mentioned site of Vieux-Reims had its most intensive occupation during the decades extending either side of *c.* 100 BC. Thereafter, its occupation density seems to have declined markedly by the mid-first century BC (Pion 2010). Outside Gaul, the *oppidum* of Manching is a clear example of early demise, with the decline of the site taking place several decades before the arrival of the Roman legions in the region (Sievers 2007).

Although far from representing a universal trait, certain *oppida* seem to have been rapidly decommissioned and replaced, in some cases by the creation of a further comparable enclosed site in the vicinity. A classic instance can be seen in northeast France with the apparent succession of Villeneuve-Saint-Germain, with its remarkable intersecting ditched galleries and evidence of craft-working (Debord and others 1988), by the site of Pommiers, also in Picardy. Coinage and other artefacts indicate that the latter, likely *Noviodunum* of the *Suessiones*, prospered particularly in the La Tène D2b phase, whereas the former seems to have been at its peak in the preceding La Tène D2a (Brun and Debord 1991). Both sites are in close proximity to the subsequent Gallo-Roman *civitas* capital, *Augusta Suessionum*/Soissons, founded in the last quarter of the first century BC. The earlier switch between these enclosed sites must have reflected particular local circumstances, whilst emphasising the continuing importance of this river valley area as a focus of settlement and power relations. In central France, the site of Levroux represents an example where a Late Iron Age settlement moved upslope from an unenclosed craft agglomeration of some 12 ha on the plain to a low hill accommodating an univallate *oppidum* of 23 ha, before moving downslope again to form a small Gallo-Roman town. Elements of the latter, including some monumental architecture, were constructed over the earlier open agglomeration (Batardy and others 2001; Buchsenschutz and others 2000; Krausz 2016) **(Figure 8)**. Similar trajectories have also been recognised in central-eastern Gaul (Barral and Nouvel 2012).

<Figure 8 here>

One factor which plainly impacted on the sustainability of certain *oppida* was their involvement in Caesar's Gallic Wars, especially sieges leading to their capture, from which some did not recover. For example, the 13 ha *oppidum* of Thuin (Belgium) is considered likely to have been the location of a destructive episode marked by Caesar's direct involvement and recorded in his account for 57 BC (*BG* II, 29-35). The site has been identified with the stronghold in which the *Aduatuci* are reported to have concentrated their

population and fighting forces. After being defeated by the Roman army, the 53,000 occupants were sold into slavery following the site's capture and destruction. Evidence at Thuin consists principally of two spreads of Roman lead sling bullets and a series of hoards of gold coins with the correct approximate date recovered in its vicinity (Roymans and Fernández-Götz 2023). The site does not seem thereafter to have been re-occupied at all in Gallo-Roman times.

A contrasting case is offered by *Avaricum* of the *Bituriges cubi*, the present-day city of Bourges, even if in 52 BC Caesar successfully attacked it and allegedly only 800 of its 40,000 inhabitants were able to escape to rejoin the Gallic army (*BG* VII, 13-32). The fact that Caesar was able to seize substantial quantities of grain and other supplies following the capture of this *oppidum* suggests that it was not immediately entirely ransacked. It is noteworthy that when, as reported by Caesar, the *Bituriges* had earlier mounted the case for not torching *Avaricum* as part of Vercingetorix's scorched earth policy of resistance, Bourges could be described as 'almost the fairest city in all Gaul, the safeguard and the ornament of their state' (*BG* VII, 15). Excavations have demonstrated that the major lines of the Gallo-Roman town –the *civitas* capital of the *Bituriges cubi*– were established by Augustan times, although Troadec (1996) concluded that the available evidence indicated that the degrees of reshaping of the terrain and reorientation of plans were such that this did not represent an unbroken succession from the pre-conquest *oppidum*. That said, as at Lyon and a number of other cases, the site was retained from the pre-conquest period into the first century AD and beyond (Reddé 2022).

Amongst the most successful *oppida* in terms of their sustainability into the following centuries are sites which became significant settlements thereafter, especially those that acted as capitals of Gallo-Roman *civitates*, the administrative linchpins of the territories within the Roman provinces of Gaul. Many of these continue to be successful urbanised places today. Whilst the chronological sequence of their occupation around the Roman conquest horizon c. 50 BC may not be unbroken, and in many cases the surge in construction work from Augustan times or later onwards may have rendered the archaeological record for the intervening decades after Caesar's victory difficult to discern, urban excavations demonstrate the existence of some examples of continuity. Numerous cases are reviewed in the journal *Gallia* (volume 72, 2015: *La naissance des capitales de cités en Gaule chevelue*); here we single out two contrasting examples for brief mention.

At Metz/*Divodurum*, the identification of a *murus gallicus* fortification on Sainte-Croix – according to dendrochronology first constructed in c. 114–112 BC and later rebuilt in 55 BC– establishes its *oppidum* credentials (Faye and others 1990). Fragments of early internal timber buildings date to 64 BC, while in the rue Marchant occupation consisting of post-built structures characterise the later first century BC before being replaced by major buildings with stone foundations during the reign of Emperor Tiberius. More recent urban excavations have confirmed use of the site in the later first century BC, and overall the evidence suggests the continuation of building in traditional earthfast Gallic styles into the first century AD, before changing mostly to sleeper-beam construction and then stone foundations by the mid-first century AD (Brkojewitsch and others 2015). Metz/*Divodurum* acted as capital of the *civitas* of the *Mediomatrici*; at its greatest extent in the third century AD, it was probably about ten times the size of the *oppidum* that was its forerunner.

A different example of settlement evolution from the end of the Iron Age into the early Gallo-Roman period can be found at Toulouse/*Tolosa* in Haute-Garonne, principal centre of the *Volcae Tectosages*. The centre of the modern city covers the new town established during the reign of Augustus. However, its main predecessor lay some 7 km to the south at Vieille-Toulouse (Gardes 2015). At this latter site of approximately 100 ha, excavations have demonstrated a succession of settlement evidence and some monumental structures, which intimate a sequence of building styles and layouts starting in the earlier second century BC. Increasing Italian architectural influences can be observed particularly in the second half of the first century BC, when brick becomes the dominant material for building and a regular plan based on Roman-style *insulae* emerged. Sanctuaries were rectilinear and built of masonry, and concrete and *tegulae* were employed at the site. The material culture including coinage suggests that this centre was abandoned at the earliest around 10 BC.

The examples of Metz and Toulouse illustrate something of the rapidity of change impacting on the sustainability of Gallic *oppida* in terms of their continuing deployment during the development of the succeeding Gallo-Roman urban network. Patterns were variable (Reddé 2022), and a flavour of this can also be gleaned by comparing the cartography of the successive periods (Blin 2023; Maguer 2023).

Several of the diverse trajectories underpinning the development of components of the Roman urban network, and the contributions of the antecedent *oppida* to that, are rehearsed by Reddé (2015; 2022). The extremes are marked on the one hand by the creation of wholly new towns particularly from the first century AD, or marginally earlier; and on the other by *oppida* which were abandoned and reverted entirely to rurality, in some cases such as the complex suite of enclosures extending to 170 ha at Le Fossé des Pandours in Alsace. Another pattern is the continued recourse to *oppida* sites, as at Metz, into the first century AD and indeed beyond, with settlement and use maintained across the decades from the Caesarian conquest to the end of the first century BC, or indeed into the initial decades of our Era, before a more distinctively-marked upswing in Roman-style urbanisation occurred. Reddé (2022) intimates that about a third of the main sites in temperate Gaul were retained in the succeeding period in this manner. Continuation did not necessarily imply retention of a specific status: a classic case is *Alesia* (Alise-Sainte-Reine) of the *Mandubii* in Burgundy, certainly an urban place in Gallo-Roman times, but without its pre-conquest local political dominance.

A further group of sites, however, is testimony to an initial phase of adoption of distinctly Italian traits in terms of their development, only for them to be subsequently –and in short order– abandoned in favour of newly-created urban foundations. In addition to the case of Vieille-Toulouse noted above, we can particularly highlight the decline of the *oppidum* of *Bibracte* and its progressive replacement by the nearby Roman town of Autun/*Augustodunum*. In the early third quarter of the first century BC, the future of *Bibracte* may have seemed assured, with its centre being monumentalised first by a probable *basilica* with a nearby *forum* and, a generation later, by a major Italian-style *domus*. Of other major houses on the hill, Parc aux Chevaux 1, with an *atrium* and peristyle, was being rebuilt and aggrandised prior to its abandonment at latest *c.* AD 30, well after construction had started at the new centre, Autun, some 20 km away in a lowland setting. Replacement in terms of administrative and other functions in this case thus seems to have been gradual, perhaps over

several decades, and not abrupt. But by early in the first century AD occupation at *Bibracte* had largely ceased, although recourse to springs and shrines on the hill continued through the Gallo-Roman period (Goláňová 2023), a phenomenon that can also be observed at other sites in Gaul. Use of the site seems to have declined in the Early Medieval period, thereafter reviving in around the tenth century AD, when the small church on the site was constructed. Temporary fairs may also have continued to occur then but are only documented from the mid-thirteenth century.

In sum, as already demonstrated by Colin's (1998) suite of maps, in temperate Gaul the emergence and duration of the use of *oppida*, initially complemented by open agglomerations, demonstrate a variety of trajectories. It is also now clear, as a result of more recent rescue excavations, that sizeable open agglomerations remained a feature of the settlement pattern into Gallo-Roman times. If some *oppida* were only occupied for a brief period –a few decades– in the Late Iron Age, at the opposite end of the scale others became successful capitals of *civitates* or lesser urban settlements in the provinces of the Roman Empire.

Conclusion

To come back to the question posed in the title, there is no simple answer regarding the sustainability of the *oppida*. This, however, should not be surprising considering the significant heterogeneity encompassed by this broad term and the different historical trajectories experienced by the various regions and communities, most notably in relation to their incorporation or not within the expanding Roman Empire. We also need to take into account the very uneven state of research across sites and regions, which makes it difficult to generalise. Having said this, we can nonetheless reject the general hypothesis that the *oppida* as a set of settlement sites were unsustainable and thus doomed to fail. Even though most *oppida* clearly had an economic role, assuming that those which were abandoned were so because of their location in economically unsuitable places risks imposing an anachronistic, capitalist approach to issues of supply and demand. If the choice of *oppida* locations was driven more by the desire to select places that had strategic and/or symbolic significance, ritual importance, and to centralise power (Fernández-Götz 2014b; Moore 2017a; Rieckhoff 2021), then their placement, while often illogical to a modern eye, may have seemed perfectly reasonable within the context of Iron Age societies.

The insertion of *oppida* into the landscapes of temperate Europe was also done in the knowledge that other, broadly similar, sites were also in development: they were not isolated places. Territorially, as economically, *oppida* functioned as parts of systems. What changed over their existence, in some instances leading to their early demise, was the emergence of different social, political, and economic models. In the case of *oppida* within the Roman provinces, many continued to develop as urban centres during the Roman period and sometimes even beyond. On the other hand, the decline of sites such as *Bibracte* or Titelberg in favour of the new Roman foundations of Autun/*Augustodunum* and Trier/*Augusta Treverorum* seems to have been related more to changing 'powerscapes' than to economic unsustainability *per se*. This is not to deny that some of the new Roman foundations were located in economically more favourable locations than the *oppida* they replaced, but to

challenge the notion that the *oppida*, as a phenomenon, surpassed the socio-economic capacities of Late Iron Age societies and were therefore predestined to fail.

In future, we need more projects focused on exploring the provisioning of the *oppida*, both through archaeobotanical research (e.g. Lodwick 2019) and isotopic and other analyses of animal remains (e.g. Moore 2020). We also need more projects to explore the immediate environs of individual *oppida* (e.g. Danielisová and Hajnalová 2014; Danielisová and others 2015), as well as investigating the so-called 'empty areas' (Nicolai 2017) within the fortified sites themselves, following the model developed in recent seminal studies by Goláňová and colleagues at *Bibracte* (Goláňová 2023; Goláňová and others 2020; Hajnalová and others 2024). Finally, advances in scientific dating and improvements in the typo-chronologies of key items of material culture should allow for an increase in chronological resolution at many sites, thus contributing to a better understanding of the persistence of the *oppida* and thereby enhancing discussion of their sustainability.

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Figure Captions

Figure 1: Distribution of fortified *oppida* between the Atlantic and Eastern Europe, 2nd-1st centuries BC (after Fernández-Götz 2018, based on data from http://www.oppida.org/, with additions).

Figure 2: Indicative lifespans of selected *Fürstensitze* (after Fernández-Götz and Ralston 2017).

Figure 3: Indicative lifespans of selected continental *oppida* (after Fichtl 2021, modified by authors).

Figure 4: Spatial patterns of the rural settlements in relation to *oppida* in the Czech Republic: almost all the examples analysed show rather empty hinterlands within a distance of 5 km (after Danielisová 2014).

Figure 5: The pattern of buildings (greyed) within the principal excavation area inside the *oppidum* of Vieux-Reims (after Pommepuy and others 2000, modified by authors).

Figure 6: Plan of Manching showing probably relatively open areas in the southern part of the *oppidum* (redrawn after Wendling 2023).
Figure 7: Location of *Bibracte* (Mont Beuvray) in relation to *Augustodunum* and Roman road network (redrawn after Barral and Nouvel 2012).
Figure 8: Levroux: Model of Late Iron Age settlement transfer from open agglomeration to enclosed site, followed by the development of a Gallo-Roman town (after Buchsenschutz and others 2000, modified by authors).