

The legacy of Roman and Greek urban planning in the cities of today

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Abstract. *The cities of the Roman Empire were characterized in particular by their chequerboard plans. Studying the plans of the same cities today, the Roman streets are only rarely recognizable. By systematic comparison of archaeological plans with those of today, and using satellite imagery as a tool, it is possible to map the degree of persistence of the Roman or Greek plan. The level of survival of the ancient plans is variable: it is high for example in northern Italy and around Naples, but generally low elsewhere, as in England and Egypt. But the process of loss and survival can be counter-intuitive.*

Keywords: Roman Empire, Roman urbanism, late Antiquity, urban morphology, geography of towns

About 1300 cities existed in the Roman Empire that were heads of a *civitas* or *polis* (Åhlfeldt, 2015; Talbert, 2000), and as many cities again did not have that status. The sites of many of these cities, and to a lesser extent those of some towns, still contain urban centres, and have kept their ancient names in a derived form (for example, *Londinium* is today London).

Attempts to determine the original plans of cities and towns with a Roman past have been mainly undertaken so as to assess their urbanism, monumental décor, and populations (Bedon *et al.*, 1988; Caniggia, 1986; Sommella, 1988). Using much the same material, the aim of this paper is to assess the survival of the street patterns and the processes involved in the different regions of the Empire, and at different times in history. The geography of the degree of conservation reveals features not previously identified, and sheds additional light on some aspects already

known. The investigation of the material reality of the city in this paper is at several scales: city, region and the entire Empire. It allows the degree of preservation of the Roman street patterns to be used as an aid to understanding long-term urban transformations.

In most cases present forms are accessible through cartographic records. In the present study satellite images are available for all the sites studied. All the approximately 1300 sites identified by Åhlfeldt (2015) as *civitates* have been double-checked on Google Maps. Some plans are well known, but this is generally when the cities have disappeared as such and when their remains have been more easily accessible in later non-urbanized areas: Timgad in Algeria, Alba in France, Xanten in Germany, Aphrodisias and Pergamon in Turkey, Paestum and Ostia in Italy are examples (Ballu, 1910; Calza *et al.*, 1953; Dupraz, 2001; Mertens and Greco, 1996; Precht, 1999; Wulf, 1999). Knowledge of the Roman street

networks is derivable archaeologically where parts of the sites have remained unoccupied, as in Autun in France, Trier in Germany and Aquileia in Italy (*Archäologischer Stadtplan Trier*, 2002; Bertacchi, 2003; Labaune and Kasprzyk, 2008), or where large-scale archaeological investigations, as in Cologne, have been aided by particular circumstances (Wolff, 2002), or sometimes when the Roman streets have been kept beneath the present ones, as in Turin (Gabucci and Pejrani Baricco, 2009). The use of geophysical methods has allowed the investigation of sites without digging, such as at Altino in Italy, but in this case a site free of urbanization is required (Cresci Marrone and Tirelli, 2011).

Generally, the Roman plans of cities whose urbanization has continued, or resumed after a hiatus, are poorly known. Sites can be checked from archaeological records and from satellite or aerial images, but none of these sources are without shortcomings. Archaeological knowledge of a city is often unduly influenced by the location of a Roman wall. At Turin, which has a well-preserved plan, recent archaeological discoveries have shown that the city extended into a wide area outside the Roman wall (Gabucci and Pejrani Baricco, 2009, pp. 235–6). The Roman grid is well preserved inside the wall, but no trace of the Roman street organization is evident outside, where in all probability it has disappeared. This is seemingly true for many Roman cities in northern Italy and elsewhere, and it means that even if the preservation level seems high, this is only for part of the ancient city. Ancient plans were systematically researched to avoid wrong identifications. Thebes in Greece and Iznik in Turkey are examples of possible mistakes, owing to their modern plans having been drawn according to the street orientations in Antiquity.

The interpretation of otherwise undated forms, a situation shared by many under-investigated densely urbanized sites, relates to a well-known fact for the majority of cities in Antiquity: the first urbanization was often prepared according to a plan of straight streets parallel and at right angles (Brogiolo and Gelichi, 1998, pp. 53–4). In reality there

were variations on this principle, sometimes with blocks eventually more or less elongated (as in Greek colonial cities), and sometimes not drawn exactly at right angles as at Rouen (Gauthiez, 1991, p. 98). The plans that escaped that regularity, however, are few. Many cities grew by phases and had generally an irregular and composite plan, made of several plan units, of which some were grid plans. The smaller towns have more often an irregular shape, owing to slow or spasmodic accretionary processes, sometimes related to a feature such as the gate of a fort, as at Old Carlisle (Jones and Mattingly, 1990, p. 174).

Recognizing such a regular plan in a present-day city whose existence is attested in Antiquity provides a strong clue to a survival of the plan. But mistaking ancient planning for medieval or even later planning is possible (Molinier, 2001). British Roman towns are a case in point. Archaeological investigations have shown that their fairly regular plans are often products of a re-urbanization in the Middle Ages (Allan *et al.*, 1984; Biddle and Hill, 1971; Biddle and Keene, 2017). Moreover, in northern Africa many cities had irregular plans.

The possible irregularity of the ancient plan may also be an obstacle. London, Syracuse, Athens, Rome and Istanbul had irregular plans. This was due to a complex formation history. In the suburbs planning seems to have been less common. Survival occurred essentially in walled-in perimeters in small areas in late Antiquity in Gaul and the eastern Empire, which often corresponded to the earliest planning phase following city foundation. The main roads outside the city were sometimes kept with remarkably well-preserved lines. There are examples of this in Florence (Cataldi, 2017) and Rheims (Berthelot *et al.*, 2013, p. 56).

The systematic checking of sites led to the identification of places where some urban features were preserved in a rural landscape, for example a wall line or a line of trees or a fence corresponding to a street. Alexandria Troas may well reflect a community becoming rural, accompanying the gradual reduction of urban life. At Rhodes, the walled-in area



Figure 1. Extent of survival of Roman street structures in present cities. Level 1: low (urban): Bodrum-Halicarnassus (Turkey) (based on Google Earth, 2013).

does not preserve well the Greek plan, but to the west of the city the previous main streets are still clearly legible as lines of trees around the fields. Conversely, at Darnah in Libya the walled-in perimeter is very well preserved, but the features of the other areas of the Greek city have been erased. These different arrangements suggest different ways of sustaining the city – in the latter case products perhaps have been received by sea.

Method and results

The preservation of Roman urban plans has already been partly mapped by Arthur (2002, Fig. 3.5), who dealt with the Italian peninsula, noting the many Roman plans that remain clearly visible in present urban structures in the Po valley. But the regional context of the

Po valley is exceptional, and a comparable state of preservation is rare elsewhere. Some syntheses dealing with the urbanization of various regions of the Roman Empire provide systematic archaeological information on the evolution of urbanism over time (Bayard *et al.*, 2004; Garmy and Kaddouri, 2013; Jones and Mattingly, 1990; Michel, 2009; Petit and Mangin, 1994).

For the present study, cartographic records have been assembled as follows for various levels of survival of the streets.

- *Level 0: about 1200 cities*

Minimal preservation, consisting of sites where the remaining streets comprise at most one or two segments measuring 500 m or less, generally crossing the ancient city area. These cities have not been mapped. A difficulty is that as the Roman walls were often reused in the Middle



Figure 2. Extent of survival of Roman street structures in present cities. Level 2: medium-low (urban): Bourges-Avaricum (France) (based on Google Earth, 2006).

Agés, especially in the western regions, the newly established streets tended to link the former gates, replicating the Roman street alignments: as for example at Canterbury, London and Exeter in Britain.

- *Level 1: 45 cities*
Low degree of continuity consisting of several street segments. (Figure 1)
- *Level 2: 32 cities*
Medium degree of preservation consisting of several streets still organized in a parallel and perpendicular shape, but where the grid is incomplete or not clearly recognizable (sometimes extant only for a very limited area of one to three street blocks). Bourdeaux and Bourges are good examples. (Figure 2)
- *Level 3: 15 cities*
High degree of preservation consisting of grids of streets still existing for at least 3–4 full street blocks or partly conserved on

more than 10 ha. This is the case mainly in Italy, the Near East and some coastal cities in the eastern Mediterranean Sea. (Figure 3)

- *Level 4: 14 cities*
Very high degree of preservation of ensembles of street blocks, exceptionally exceeding a few dozen ha (compared to the hundreds of ha of the largest Roman and Greek cities). (Figure 4)
- *Rural persistence*
Some 17 sites, by a conservative estimate, bear testimony to ancient cities conserved only in the rural plot pattern. Such survival has probably only occurred where the abandonment process after urbanization was relatively smooth. Examples are Burnum, Cnidus, Luni, Keramos, Alexandria Troas, and the sector of Rhodes outside the walls. (Figures 5, 6 and 7)



Figure 3. Extent of survival of Roman street structures in present cities. Level 3: medium-high (urban): Marsala-Lylibaeum (Sicily) (based on Google Earth, 2006).

Cities that bear no trace of continuity have not been mapped, although they may appear today as impressive archaeological sites with monuments still standing or rebuilt from collapsed remains as at Ephesus and Pompeii. The survival of the street form is a measurable aspect of the degree of continuity from Roman urbanism to the cities of today. However, another phenomenon on many sites may explain the search for clues of the Roman urban past where plot limits perhaps retain an orientation derived from Antiquity. This is when orientations may have been transmitted by the establishment of new plot limits in parallel or perpendicular to Roman structures and limits. In these cases, the preserved Roman elements act as influences on new alignments. This explains why the centres of many cities have a plan largely determined by the Roman plan, but with only a limited number

of directly transmitted elements. Generally, the continuity is only apparent, made of elements that have appeared centuries after the Roman period.

Eventually, many towns, like Aosta, have been redeveloped from the nineteenth century onward along topographical lines deriving from Roman times: for example, Alexandria in Egypt, part of Trier, and several Greek towns. The realignment in modern times of ancient streets may also, in some cases, have made them extremely regular, although old plans show them as having been less so, as in Turin. Making a distinction between a true survival and a similarity owing to later development is in such cases quite difficult without archaeological data or pre-nineteenth-century plans, which have been used in this study for level 3 and level 4 cities. Another case is that of Damascus, where the heritage



Figure 4. Extent of survival of Roman street structures in present cities. Level 4: high (urban): Allifae (Italy) (based on Google Earth, 2006).



Figure 5. Extent of survival of Roman street structures on rural sites. Level 1: low: Burnum (Croatia) (based on Google Earth, 2006).



Figure 6. Extent of survival of Roman street structures on rural sites. Level 2: medium: *Cnidus* (Turkey) (based on Google Earth, 2006).



Figure 7. Extent of survival of Roman street structures on rural sites. Level 3: high: *Alexandria Troas* (Turkey) (based on Google Earth, 2011).

of the ancient plan has been long recognized, but where no entire Hellenistic street blocks have been conserved and the legibility of blocks is poor. In consequence, Damascus has been placed at level 2 (Saad and Benech, 2013).

The levels here actually form a continuum, and should not to be considered as separate. Nor should the number of sites be considered as definitive. As there is uncertainty about the Roman extensions of the cities and sometimes even their actual street form, quantification has been attempted only for cities at levels 3 and 4, whose ancient plans are at least partly recognizable. Some very significant geographical features appear on the map of the preservation of streets. In many regions, there has been no survival of the Roman street pattern, as in Egypt, Britain, Germany, the Aegean, the Balkans and central Anatolia. In other regions there are rare, poorly preserved occurrences – for example in northern Africa and Spain, although Roman cities were very numerous in these regions. Clearly, the level of conservation is not determined by the Roman level of urbanization (Figure 8).

Only 106 urban sites in level 1 have been identified as retaining Roman features, less than 10 per cent of the total. Less than 3 per cent of the Roman and Greek cities have kept a recognizable part of their ancient street networks. Seven per cent of them have kept only some less organized features. In the towns without *civitas* or *polis* status, the percentage is close to zero. Conversely, about 90 per cent of the cities have conserved no definitely identifiable part of their Roman plan, excepting street segments in some cases. Well-preserved areas, which only occur in levels 3 and 4 (about 29 cities), extend over an average of 35 ha per site.

Two features are especially evident. First, the average well-preserved city is rather large, and small well-preserved urban areas are very few. Secondly, assuming the average size of a Roman city to be 40 ha, which is probably a conservative estimate, the proportion of Roman cities in which the block pattern is still legible probably does

not exceed 2 per cent: that is 1000 ha preserved compared to 52 000 ha originally developed. These figures match those of Ward-Perkins (2005). To sum up, some 3 per cent of cities reveal a good level of preservation for no more than 2 per cent of the total Roman street patterns. What led to such a low level of survival? The minimal survival of the Greek cities is even more striking: only a very few of them, and no *polis* of the Classical period, appear on the map (Figure 9).

Processes involved in the disappearance of streets

The mapping of the preservation of ancient cities leads to the question of how they passed from their ancient form to that of the present. The role played by the main built-up structures may have been important. It is evident too that the best-preserved cities were often accompanied by a well-preserved rural area.

Degradation processes

In some rare cases, natural phenomena were the cause of the disappearance, as when Pompeii and Herculaneum were buried by an eruption of Vesuvius in AD 79. In AD 749, an earthquake put an end to Scythopolis. In northern France, many cities bear the traces of major fires in the second half of the third century. It is tempting to search for a culprit in the German incursions of these decades. This is a strong possibility, but no proof has been found to link with certainty archaeological data and written sources. Whatever the explanation, the cities did not recover from these destructions. Many were afterwards protected by a fortification wall around only a small part of the previous urban area. Large fires, deliberate or not, are an obvious factor in decline, especially when the economy is weak, which was the case at that time.

Economic and political disruptions, as occurred in late Antiquity, were major factors in urban decline. Many scholars have recently



Figure 8. Degree of preservation of street structures in the Roman Empire. The names of cities whose Roman or Greek plan has been lost after 1900 are in parentheses. (Based on Finnett 2012–17).

written about and debated this topic (Bianquis *et al.*, 2012; Brogiolo and Gelichi, 1998; Brown, 1978, 1992; Christie, 2011; Dey, 2015; Fleming, 2010; Krause and Witschel, 2007; Mitchell, 2007; Slater, 2000; Ward-Perkins, 2005; Wickham, 2009). The effects on cities of climatic changes and events, and epidemics such as the Justinian plague, have been important, but remain difficult to assess (Harper, 2017). They certainly added to the disruption brought by wars and aggressions. The building of defence walls required huge resources in a difficult period, and led to the abandonment of extramural areas. The late-Roman walls were a major means of protection, but some were limited to a large building, such as the forum at Bavai. The Empire in its

late period was subject to numerous aggressions from outside its frontiers: German peoples and Huns in the West, Slavs and Avars in the Balkans, Persians then Arabs in the East, and Berbers then Arabs in Africa. The Arabs and then the Turks remained a menace until the seventeenth century, which certainly explains the very low level of survival in the eastern Mediterranean. The Vikings were very disruptive in the ninth century.

There was a very low level of survival along the coasts. The preservation of Sorrento near Naples was helped by its defensive situation on a high hill overlooking the sea. Many ports disappeared because of the disruption of sea commerce and incursions by pirates, or were abandoned owing to the loss of key sections



Figure 9. Importance (in hectares) of Roman urbanism conservation based on extant street structures. Where the name of a city is in parenthesis the city had lost its Roman plan in the twentieth century.

of their populations as a result of wars and economic difficulties.

Destruction and disappearance occurred mainly in late Antiquity and the early-Middle Ages, but sometimes later, at a lesser scale. What remained of Roman streets in the city of Rouen was further reduced when the Vikings redeveloped its centre after 911 (Gauthiez, 1993). The introduction of new streets in the nineteenth century entailed removal of earlier structures, as in Sorrento and Florence. A fire in 1917 destroyed Thessaloniki, which had been the largest surviving ancient Greek plan, covering over 100 ha, although it had been attacked and plundered several times after Antiquity to such an extent that it is surprising that it did not cease to exist much earlier (Odorico, 2005). A fire also destroyed Edirne in Turkey

in 1905 (Yerolympos, 1996, pp. 80, 88–105). Soissons and Rheims were redeveloped after the First World War according to a modified plan. Comparison of actual urban forms with the Roman ones establishes clearly that the level of survival has been extremely low.

Conservation processes

A number of factors affecting survival can be recognized: material action, military organization, political structure, social continuity and economic context.

Material action has consisted essentially of the building of walls and defences to protect all or part of a city. The Aurelian wall at Rome in the 270s enclosed the major part of the city,

whereas the third-to-fifth century walls in France protected only a small part of the urban area: from 5 per cent or less in Lillebonne and Lyons to 20 per cent or more in Poitiers and Metz. The early walls around the cities with colonial status were of little military significance and many were replaced by enceintes around a more limited urban area. Apart from access roads, all the surviving Roman streets seem to be located inside city walls. So a wall was generally a *sine qua non* for survival. Reduced walled-in areas are common in the Empire. But on the whole the African cities without walls disappeared.

Concerning military organization, the location of troops and command sites have arguably been favourable elements in the survival of streets in north-east France (Metz, Rheims, Soissons) in relation to the campaigns against the Germans. However, the withdrawal of the imperial troops from England in 410 was followed by a major disruption of city functioning. On the Continent, many cities survived, albeit for a limited time, because they were occupied by a troop unit. This is clearly visible in the cities on the coast of the Byzantine Empire. Zadar, Albenga, Antalya, Thessaloniki, Darnah and Marsala survived because they were places essential to the functioning of the Empire, relying on the maritime links permitted by strongly fortified ports. Thus communications could be maintained with Constantinople, as well as the dispatching of troops and the supplying of food. Marsala was the closest harbour facing Africa from Sicily and Darnah the closest facing Crete from Libya, facilitating closer links by ship. Paphos in Cyprus was that island's port closest to the Aegean.

In relation to the administrative and military organization of the late Empire, in Gaul half of the cities with a 1–2 conservation level were capitals of provinces as reorganized by the Emperor Diocletian in *c.* 300 CE. More generally, of 18 capitals, 4 are at level 2 in respect of conservation (Sens, Bordeaux, Bourges and Narbonne), and 4 at level 1 (Cologne, Rheims, Besançon and Aix-en-Provence). Rouen was probably among these cities before its destruction by the Vikings in

the ninth century. Overall, only 17 cities out of some 125 in Gaul are present on the map (Figure 8). In the case of armament production sites as listed in the *Notitia Dignitatum* (Seeck, 1876) at least 4 cities out of 6 in the *Italiae* kept a recognizable Roman street network (Verona, Cremona, Lucca and Pavia; the street networks of Concordia and Mantua had disappeared), and 2 sites out of 7 in Gaul (Rheims and Soissons; the streets of Trier, Autun, Argenton, Amiens and Mâcon having ceased to exist). In the East, Antakya, Damascus and Edirne survived, but the streets of Nicomedia, Kayseri, Irenopolis, Sardis and Edessa had disappeared (Christie, 2011, p. 71). All the cities with weapons factories in Illyricum and in the broader Balkans had ceased to exist, except Thessaloniki. Of the imperial capitals, the plan of Aquileia had disappeared, despite the building by the Byzantines of a new retracted wall in *c.* 552 (Bertacchi, 2003, p. 23). The plan of Trier had disappeared as well, and the plans of Milan and Rome bear only a weak testimony to their Roman shape. The plan of Istanbul is another example of the impossibility, once the Empire had shrunk in size, economic importance and social organization, of keeping principal functions fully working. Istanbul does not even appear on the preservation map.

To understand why such a high level of continuity was achieved in the Po valley and in Campania, another aspect of the administrative structure needs to be examined. The archaeological finds show that the level of rurality inside the walled-in areas was possibly no less than in, for example, the cities in Gaul. Many rural areas developed in previously built-up sectors. Even at Piacenza, where the street pattern is among the best preserved, archaeology has shown that rurality had spread within the city (Brogiolo and Gelichi, 1998, p. 54). A level of control of the boundary between public streets and private property was certainly active here (Ward-Perkins, 1992, p. 35). Another hint as to the independence between the high level of urbanism and continuity of the streets in this context is the fact that in Turin the Roman street plan was well preserved, but in parallel a new major

street appeared in the early Middle Ages. This new street was created when the market area developed, cutting across the Roman grid between the communal centre near the market and the cathedral compound. In this case, a new centrality developed independently of the preserved Roman grid. The long duration of rural occupation may explain the shift in the street boundaries over time. This is quite remarkable at Alife, where the ancient streets lost their straightness (Gauthiez, 2008). The boundaries around the now largely rural private plots were generally marked by vegetation, and periodically replaced, while the streets were no longer paved or delimited by buildings, but had become earthen paths. This led to unclear limits that fossilized when urbanization returned. Conversely, in a city like Naples, the straight street limits suggest that higher levels of urbanism may have remained. Administrative and legal continuities were therefore essential for survival. It has to be stressed that the preservation of the street organization did not proceed primarily from the continuity of urbanism, especially in respect of buildings along the streets (Brogiolo and Gelichi, 1998, pp. 53–4). In the Po valley, the primary factor was probably the continuity of a property right inherited from the Roman period and maintained by the Germans (Brogiolo and Gelichi, 1998, pp. 126–7).

Social and cultural continuity may well have been a key factor in the conservation of Middle Eastern cities, such as Antakya, Latakia, Aleppo and Damascus, although the role of these cities in military organization may also have played a part. Here the important Christian and Jewish populations were probably influential in the survival of ancient forms, as their language was predominantly Syriac, a close Semitic parent of Arabic (Teule, 2012, p. 59), aiding understanding between the former inhabitants and the new rulers after the Arab conquest. Another social factor in favour of Byzantine ports was the refugees fleeing from the many sea raids by the Arabs, and later the Turks. They regrouped in places like Thessaloniki and other ports that were military strongpoints (Ward-Perkins,

2005, p. 260). Even so, some cities became only shadows of what they had been. Cnidus became a small village, whose fields occupied the terraces of the former city. This region of the Aegean still bears the marks of diminished continuity in several sites whose form has been preserved only in rural features, as in Alexandria Troas.

Economic context is an obvious factor in continuity. The residences of powerful and wealthy élites inside the walls have been considered by historians to be a key element in the health of cities in late Antiquity. This can be illustrated by the difference between France and the Po Valley in the sixth and seventh centuries. In France, the élites frequently had a main residence outside the city, a sort of rural palace or villa, while in northern Italy they were more attached to a city residence and to the defence of the town, thus favouring the urban economy. This may have contributed a great deal to the difference in the evolution of city forms.

The grid structure of rural properties around the city, particularly when deriving from a planned Roman organization, is frequently associated with a degree of conservation of the city plan. This is particularly clear in the Po valley, the region of the Roman Empire where the rural features are best preserved, and around Fondi, Capua and Alife in Campania (Chouquer and Favory, 1992).

The degree of conservation of the main buildings is quite varied. Strikingly, it is poor where the street grid is still used today. In many northern Italian or northern French cities, no ancient monument is standing. At Verona, the amphitheatre remained probably only because it was transformed into a fortress. This probably occurred at Tours as well (Seigne, 2007). Not surprisingly, the materials of Roman buildings have been very heavily reused. Ancient monuments remain primarily where urban activity was low or very low after Antiquity, as in Pula in Croatia and Merida in Spain, or when individual buildings had retained significance, like the temples at Nîmes and Assisi, possibly reused as municipal buildings. The maintaining of cities during the difficult fourth-to-sixth centuries was

generally possible only by using the materials of buildings erected in the previous buoyant periods. The new walls were often made of stones taken from these buildings. Moreover, the many Christian constructions, later the Muslim mosques, were largely made of stones, columns and bricks taken from decommissioned monuments. In late Antiquity the Roman monumental heritage was systematically used to meet new military and religious requirements. In consequence the redevelopment of cities in the Middle Ages in many cases led to the final disappearance of Roman buildings. In c. 1100 in the cathedrals of Pisa and Otranto, Roman ashlar and columns were taken, probably from still standing monuments, and reinterpreted in the new way of Christian Romanesque architecture.

In this light, the general pattern of conservation of cities can be interpreted in relation to various causal factors. The best-preserved cities along the coasts of the Mediterranean Sea are all Byzantine. Generally, their hinterlands are devoid of conserved cities. The survival of urbanism in the future Pope's states has also been heavily influenced by the continuity of the Byzantine Empire, particularly reflecting maintenance of its administrative and military structures. There is a direct relation between belonging to that Empire and the survival of so much of the organization of streets.

In the Po valley, the best-preserved urban features are in the area invaded by the Lombards. The best preservation in northern and eastern France, but with much fewer street sections, corresponds to the heart of the Frankish kingdom from the fifth century. The mapping suggests a link between the presence of German troops in these areas and the extent to which cities have been conserved (Christie, 2011, pp. 56–62). This presence occurred from the mid-third century and was amplified later. The Lombards and the Franks invaded already deeply Germanized regions. The disruption seemingly did not develop in these regions as much as elsewhere in the Empire, and the urban features were perhaps accordingly better maintained. This could mean that the conservation of the shape of the Romans' cities in the Po valley

was due to the cultural continuity between Romanized Germans settled within the frontiers of the Empire, mentioned as *Laeti* in the *Notitia Dignitatum* (Seeck, 1876), and invading Germans. Eventually, the Empire had received large groups of Germans in Gaul and Italy, according to treaties giving them territories in 419 (Visigoths), c. 442 and c. 440 (Alans), c. 443 (Burgundians), and 476 (Ostrogoths). This affected Toulouse and Bordeaux, Valence and perhaps Orléans, and the Italian northern cities. In northern Italy, the Ostrogoths acted as intermediaries between the Roman Empire and the Lombards, adding to the important German-origin populations already settled in the fourth century (Mitchell, 2007, p. 75; Seeck, 1876) (Figure 10).

The well-preserved cities in the Middle East were originally large ones. But this does not satisfactorily explain why many other cities disappeared, for example in Egypt. Part of the explanation could be the presence or absence of Semitic populations speaking Aramaic or Syriac. These populations, comprising Arab groups could have acted, like the Romanized German populations in the Po valley, as a mediation between the Byzantine structures and the invaders, including Semitic ones, in the seventh century (Bettini, 2012, p. 301; Kennedy and Riley, 1990, pp. 36–9). However, none were present to mediate between Copts and Arabs in Egypt (Seeck, 1876; Tillier and Bianquis, 2012, p. 87). In the Near East, though not in Egypt, the proximity in language, ethnicity and religion may well have acted as a strong mediation between the new conquerors and the late-Roman administrative structures, a mediation facilitated by the numerous Arab troops employed by the late stages of the Empire.

Discussion

These observations point to a remarkable pattern. Outside the Byzantine continuity, all the areas where the street structure was best preserved are where continuity developed



Figure 10. Conservation level of Roman cities in northern France and northern and central Italy compared to those in early extensions of the Frankish and Lombardic kingdoms.

between the structures of the Empire and those of the invaders through the growing presence inside the Empire itself of settlers culturally close to the invaders. Everywhere else, particularly in the areas far from the frontiers, where no Germans were established previously, the urban Roman structures disappeared, especially in Africa, Spain, Greece and Anatolia, and to a lesser degree in southern Gaul. This could explain why there is no correspondence between the levels of Romanization and urbanism during the Empire and the level of preservation of the Roman street structures after the disappearance of the Empire. If it were so, the Greek regions would appear as salient ones, although they are among the areas where the erasure is near total. This could also explain the exception of Tebessa in Algeria today, one

of the rare preserved Roman urban structures in Africa. Tebessa was a Byzantine military outpost facing the Berbers, protected by a late wall. The Byzantines used Berber warriors to combat Berber incursions and later invasions (Christie, 2011, p. 220; Lepelley, 2006). But in this region the decisive factor was that the invading groups of German Vandals and Semitic Arabs had not been previously established in the region. The Vandals had grown used to Roman ways through their travels in Gaul and Spain, and so kept elements of Roman heritage. The Arabs were totally new to Africa. Generally, nevertheless, where the arrival of a new population was too massive in regions previously militarized and already Germanized, the erasure was also total, as it was between Brittany and the Rhine region,

and, apart from some coastal cities, in the Balkans and in Venetia.

Eventually, the multi-culturalism of some already immigrant German populations, especially in the Po valley, and to a lesser extent in Northern France, and of Arab groups in the Near East, may have been a key factor. Where the peripheral tribes had acculturated insiders speaking their languages and sharing cultural traits and religious inclinations, their invasion may have led to lesser disruption. The acculturated populations, for the meantime Roman and still German or Arab, provided transmission and mediation. In short, the previous German immigrations may have been a decisive factor in the permanence of Roman urban street forms in Northern Italy and Gaul. This was possibly due to some ideological considerations, both at the level of individuals and, more commonly, at the political level. To quote Procopius in the fifth century:

Roman soldiers... stationed on the frontiers of Gaul to serve as guards... handed down to their offspring all the customs of their fathers... Even today they are clearly recognized as belonging to the legions to which they were assigned in ancient times, and they carry their own standards when they enter battle... And they preserve the dress of the Romans in every particular, even down to their shoes (Fleming, 2010, p. 37).

It has to be stressed that these 'Roman soldiers' were certainly of German origin.

The map of the persistence of the streets is a fossilised one, as the disruptions of late Antiquity had their effects mainly in the fourth-to-seventh centuries. The cities whose plans disappeared afterwards were not very numerous. Another aspect of the mapping is that no element of interpretation clearly involved the Church. The Church organization was seemingly not a significant factor in the general pattern of the conservation of Roman urbanism, which is not the conclusion generally drawn from the written sources (Gauthier, 2014, p. 398). Its role in the transformation of cities has to be reassessed, as it was evidently vital in their preservation as

political and economic centres, the *civitates* generally becoming heads of later dioceses. However, in the meantime a new factor of disruption was the well-known development of new urban polarities around burial places outside the walls.

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