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## Original Study

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# The Road Network in the *Longue Durée*: A Reading Key of the History of Territories

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**Abstract:** The historical study of routes has long remained confined to the great Roman roads, to the modern royal roads and to the medieval pilgrimage routes. For fifteen years, the French school of Archaeogeography has revisited this research field in great depth, following the first intuitions of the archaeologist Eric Vion. The innovative idea – at least because it leads to a questioning of our methods – is to consider the current road network as the starting point of the analysis. It is the true object of research for the historian-archaeologist because it represents a solid legacy whose logic one must unravel. Because this story is closely integrated with urban, political and economic matters, the study of this inherited road network represents a precious reading key to understanding the history of the territories in the *longue durée*. In the frame of this paper, we propose to recall these methodological advances and to present a case study in Brittany, around the small town of Châteaugiron. By this example, we want to show that the archaeogeographical analysis and interpretation offer a scientific narrative based on the paradigms of complexity and resilience to contemporary societies in charge of our territories.

**Keywords:** Roads, ancient roads, road network, itineraries, territories, heritages, *longue durée*, Archaeogeography, Landscape History/Archaeology, Brittany.

## 1 Introduction

The study of old paths and roads is not new; it has been very active since the late eighteenth century and especially in the nineteenth century thanks to local scholars. However, these research works have been concerned mainly with the ancient routes and consisted of collecting sections entering an axis known in advance. Thus, this method did not consider the roads and paths as a network, which is diachronic and complex. The real methodological and theoretical bifurcation was reached at the end of the eighties with the publication of a programmatic paper by the Swiss archaeologist Eric Vion (1989). He broke with previous methodology by clarifying the distinction between “itinerary”, “layout” and “section”, by taking into account all the periods instead of only one, by studying the roads as a system (and not just a few particular roads) and by using the contemporary road network as a starting point. The defining idea is that the road networks are profoundly hetero-chronic and mobile: “[...] today’s road systems are composed of an accumulation of strata that contain indications of their history” (Vion 1989: 69). Different strata correspond to phases that may be “active”, “lethargic” or “obsolete” (Vion 1989: 74). Regional road systems appear dense not because they have had to respond to increased traffic, but because they are the product of the successive stages through which they were formed (Vion 1989: 79). This approach involves taking into

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account the duration because we do not research anymore only a dated object, but a resilient route in time through different road layouts that move. It falls to the historian, on the basis of maps, “to bring order to this muddle by identifying the itineraries within it”, these being made up of the road systems that have evolved in space and over time (Vion 1989: 85-6). Thus, as Éric Vion stated, does this contemporary “muddle” bear witness to its past. It behooves the historian-archaeologist to identify the various stages of what that past holds.

Subsequently, different European researchers have developed his propositions, in particular in Catalonia and Northern Italy, under the discipline-name “archaeomorphology”<sup>1</sup>, and in France, under the name “archaeogeography”, also called “archaeomorphology” at a first stage (Chouquer & Watteaux 2013). Inside this French school of Archaeogeography<sup>2</sup>, Sandrine Robert (2003, 2009a, and 2009b) has continued the work of *modelling* the behavior of road networks. She combined the results of Vion with the recent research works in archaeogeography on the morphological analysis of the parcels of land, the archaeological data and the work of the “new geographers” interested in communication networks. Her work produced some of the classical illustrations of the different levels composing these systems (cf. Figure 1). Therefore, she started to analyse, to interpret and, above all, to propose new theoretical and methodological approaches to study the road networks. We rely on Robert’s work as the basis of our approach, which we recall in the first part of our paper.

Obviously, some of the used methods existed previously, particularly the carto-interpretation analysis and the historical analysis of the centres served by the routes. The originality of these two researchers has introduced greater complexity in the analysis of road networks, which are now thought of as systems operating at various spatial and temporal scales. Thus, the new directions of research they have created and implemented have renewed the traditional discourse on ancient ways, focusing on the dynamics of the road layouts within the same itinerary. It is this new approach I wish to present here, detailing the example of the itinerary between Rennes and Angers in western France that I studied over a long period of time and particularly around the little town of Châteaugiron in Brittany. This study was carried out within the framework of cooperation with the archaeologist Isabelle Catteddu, who excavated an important site south of Châteaugiron, and funded by INRAP.<sup>3</sup> The purpose was to “get out of the site” to better understand its history and to provide reading keys of the historical dynamics of the current territory of Châteaugiron.<sup>4</sup> I want to present the results and the conclusions of this work here.

## 2 Methods: Presentation of the *Archaeogeographical* Analysis of Road Networks

### 2.1 Theoretical Premises: To Deconstruct the Contemporary Road Network

In order to study this old itinerary, I started from the *contemporary* road network. As I stated in the introduction, this approach differs radically from the classical approach, which works inside a given historical period and starts with a collection of archaeological segments. To be precise and to enter into the

<sup>1</sup> Cf. the works of the GIAP inside the ICAC laboratory.

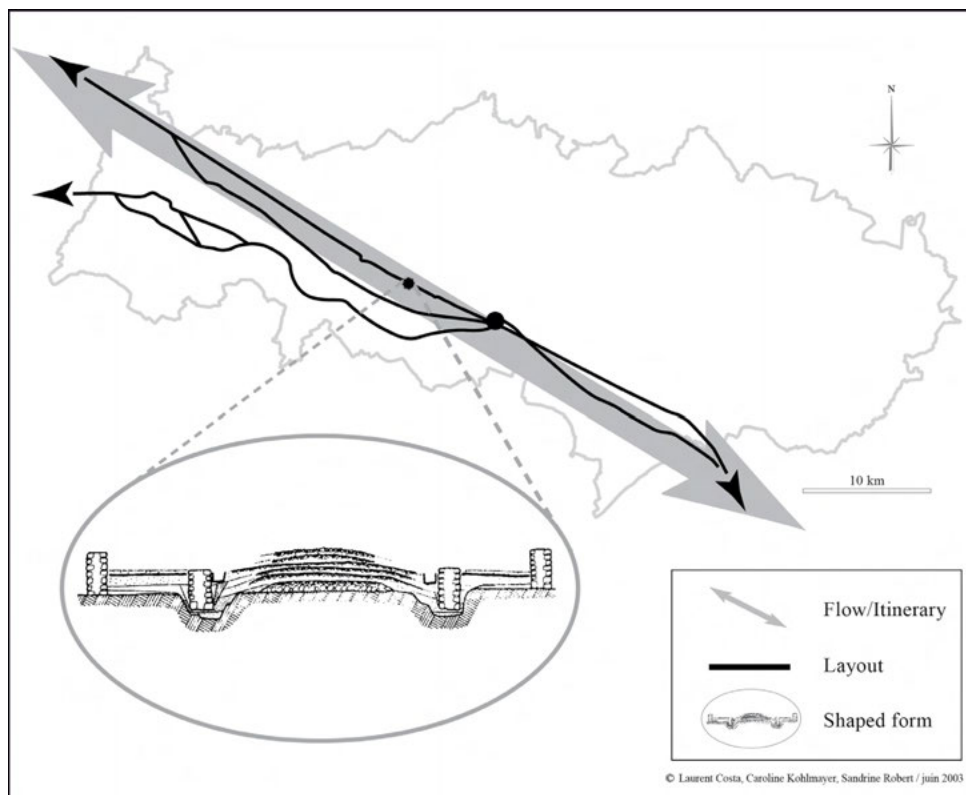
<sup>2</sup> This relatively recent discipline can be defined simply as the multiscale study of the rural and urban space of past societies, which seeks to contribute to the reconstitution of the periodized history of forms of landscapes and territories and to the knowledge of long-term (or ‘*longue durée*’ in French) dynamics that constitute inheritance (Chouquer 2003, Chouquer 2007; Watteaux 2011, Watteaux 2014). The “archaeological” prefix denotes a special interest in the historical duration, the initial professional origin of many archaeogeographers and a specific attention to the “archaeology of knowledge” of the philosopher Michel Foucault, which means the criticism of the objects installed by history and geography (but with the target to restore them or reconstruct new scientific objects). The term “geography” expresses the interest in the surface of the ground, i.e. the forms, and in the original nature of these geographical dynamics. This geography claims that the interpretation of forms is always based on the comprehension of what we inherited.

<sup>3</sup> National Institute of Preventive Archaeological Researches.

<sup>4</sup> This study also includes an analysis of the forms of the (rural) landscape, but I will not present here these results.

complexity of the history of this axis, I conducted the analysis by distinguishing different levels (cf. Figure 1) (Robert 2003: 437-457, Robert 2011: 164-165):

- The “flow” (*flux* in French): it is the fluid form of the network. It is quantifiable by the number of items (goods, people, water, sediment, etc.) flowing between two spatial units in a given period. The flow results in a “solid” form (the “layout”) to frame and allow communication between the centres.
- The “itinerary”: it represents the shortest connection between two points and it is associated with a flow. It can be understood on a global scale (as a liaison between the centres), but also on a local one because the flow is materialized by a succession of local situations on the ground (as for a river we measure the flow at different located points). The itineraries usually have great durability over time, but they have never (or almost never) kept their original layout. The sustainability of these itineraries is mainly correlated with the role and the economic weight of the centres connected to them, since the importance of the latter strengthen the itineraries that will themselves contribute to enhance the economic importance of the connected settlements.
- The “layout” (*tracé* in French) corresponds to the shape of the itinerary on the ground. It is the form in two dimensions that is observed on the planimetric documents (maps, cadastral maps, aerial photos...) or during aerial surveys. In its relationship with the concept of itinerary, the ideal shape of a road layout would be a connection by the shortest route. The layout may have been designed *ex nihilo*, closely associating itinerary and road layout (as Roman roads or highways) or, most often, the layout may consist of an assembly of heterogeneous sections belonging to all periods and entering in the main direction the itinerary. Most of the time, many road layouts have succeeded or have coexisted within the same itinerary. Indeed, they are more variable over time. Moreover, they do not fit in linear time but, instead, they are deeply dynamic: the examples of continuity of a layout in the long term are very rare and after a *hiatus* a layout can regain lost function (adopting a new “shaped form”).
- The “shaped form” (*modèle* in French) represents the shape of the layout on the ground, its viability, which is what an observer perceives on the ground. A road layout may consist of a series of different



**Figure 1.** Multi-level modelling of the forms of the road networks. Source: Robert 2011: 438.

shaped forms: motor road, simple service road, etc. These items occupy a volume in space that can be the object of a statement (stratigraphic section, technical drawing of a bridge, etc.). It is the most fluctuating level over time because the modifications of roads are faster, of course, than changes in itineraries. Finally, the temporality of the shaped form is linear: it is that of its physical decomposition until its disappearance into an archaeological trace.

It is essential to separate these levels, in particular the itinerary and the layout that are sometimes confused in the literature. This confusion explains why some authors believe that there is continuity between ancient Roman roads, royal roads of the modern era and our current roads, although it is only a phenomenon of resilience of the itineraries with changes of the layouts. However, these levels can be associated in their temporality: the flow and the shaped form are present in short, linear and physical time, while the itinerary and the layout remain for a long time. The layout also notes a complex temporality because it can be reactivated at different times depending on nonlinear terms (Robert 2003: 445). For this reason, it is better to talk about “spatiotemporalities” than about temporalities because the conditions for the transmission of the forms happen according to various chronological and geographical scales. It is these different spatiotemporalities that explain the dynamics of road systems.

## 2.2 To Compile the Maximum Number of Data and Analyses in GIS

The archaeogeographical study of road networks is based on the analysis of many different data sources that refer to different temporalities: old and contemporary maps, vertical aerial photographic missions carried out by the National Geographic Institute since the 1940s, former and contemporary cadastre, archaeological forms detected by photo-interpretation and archaeological data obtained by excavations (mainly preventive). These documents and data were combined in a GIS and studied at several scales, from the scale of Brittany to the window of an excavation (cf. Table 1). I also worked on the *longue durée* to capture long-term trends and bifurcation times.

Then, from this corpus, the forms required for the morphological analysis can be identified. In particular, we draw all linear elements with a “remarkable” alignment, likely to correspond to an old path or road. It is “a succession of sections articulating in a coherent layout and favouring a direction imposed by major itineraries” (Robert 2003: 353). So, it is the form that guides the statement; the nature of the shaped form is not taken into account. Indeed, as we have said, a layout may correspond to several sections with different shaped forms. It is also appropriate, at this stage, to go beyond the traditional division between “active form” and “disappeared forms of landscape” (*formes fossiles* in French) in order to work on the *transmitted* form, that is to say “a fossil form that can potentially be reversed or an active form which is the result of an inheritance” (Robert 2011: 9). Thus, to reconstruct a coherent road layout we have to draw both the portion of an archaeological track visible on aerial photos and the portions of existing roads, or as they are transmitted in various forms (hedge, limit of parcels, municipal boundary, etc.) and readable on maps. See the heuristic example on the north of Nouvoitou (cf. Figure 2). The layout of the ancient route from Rennes to Angers is perfectly preserved in the planimetry under many variously-shaped forms: trail, town road, hedge, main road and even municipal boundary. At last, nearby, the layout was spotted by aerial survey.

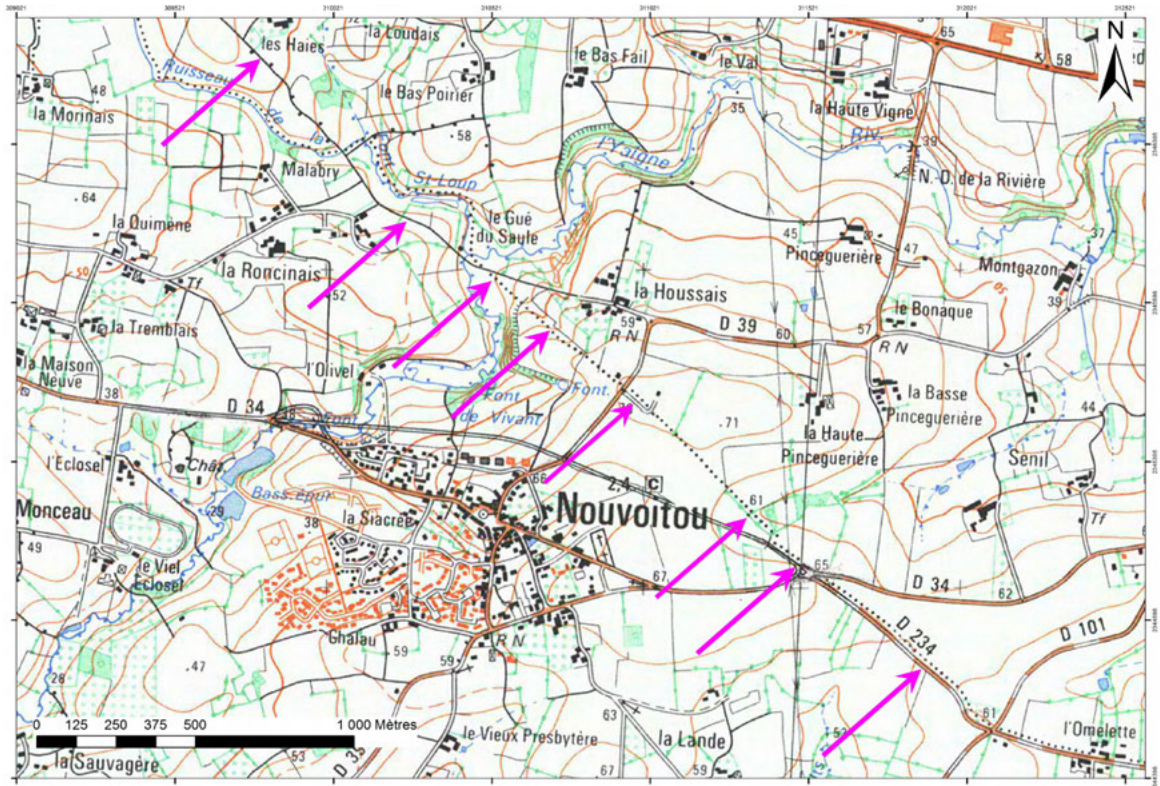
The result of this work is a series of linear forms we assemble in a second time in order to propose a hypothesis of layouts inside different itineraries (cf. Figure 3). This method prevents the prioritization of forms between the global and local levels. It also allows us to go beyond the simple observation of the most well-known layouts in order to enrich our knowledge of the itineraries or to discover new itineraries that were misunderstood before. The fact that many insured, alleged or potential layouts compose an itinerary should not be a surprise. Indeed, in previous ages there is always a multiplicity of possible paths for the same route, not to mention individual cross-country paths. The historian Jean-Christophe Cassard writes about the late Middle Ages in Brittany:

Here, as almost everywhere in the medieval West, there is a network corseted in its layout only in the immediate vicinity of the towns, where the traveller finally runs into the ‘paved roads’ whose presence indicates precisely that he is about

to penetrate into urban territory and pass under the jurisdiction of the city. [...] there are ‘itineraries zones’ [‘*fuseaux d’itinéraires*’ in French], roughly parallel and coming together out of necessity only in respect of fords or bridges: according to the seasons, the state of the soil more or less spongy or hardened, the progress of the crops causing the temporary installation of removable fences, one takes the most convenient passage; even if it is not always the shortest one. (Cassard 2002: 140-141)

**Table 1:** Documents and data used for the archaeogeographical analyses.

Documents and data	Dates	Level of scale	In GIS ?	Type of main information
<i>Atlas itinéraire</i> of Ogée	1769	Very small	Yes	Detail of some Breton highways with surrounding habitat
<i>Carte géométrique de la province de Bretagne</i>	1771	Very small	Yes	Settlement + roads + hydrography + woods
<i>Nouvelle carte de l’Évêché de Rennes</i>	ca. 1770	Small	Yes	Settlement + roads + hydrography + woods
Carte de Cassini	1785 (surveying) and 1815 (modifications)	Very small	Yes	Settlement + roads + hydrography + woods + marshes
<i>Atlas national</i> de Dumez et Chanlaire	1790	Very small	Yes	Settlement + roads + hydrography + woods
<i>Carte itinéraire de la 14e division des Ponts et Chaussés</i>	1790-1794	Very small	Yes	Settlement + roads
Dessins-minutes de la carte d’État-Major	1846-1847 (surveying) and 1866 (publication)	Mesoscale	Yes	Settlement + roads + hydrography + topography + vegetation
<i>Carte itinéraire du département d’Ille-et-Vilaine</i>	1838	Small	Yes	Settlement + roads + main hydrography
<i>Atlas national illustré de Levasseur et Combette</i>	1852	Small	Yes	Settlement + roads + hydrography + vegetation
Cartes topographiques et base de données contemporaines	2 <sup>nd</sup> half of the XX <sup>th</sup> c.	Small	Yes	Settlement + plots of land + roads + hydrography + topography + vegetation + administrative divisions
Carte géologique	1994 and 2000	Mesoscale	Yes	Geological substratum
Cadastre parcellaire napoléonien	1809-1850	Large	Yes	Settlement + property plots + roads + hydrography
Cadastre actuel	End of the XX <sup>th</sup> c.	Large	Yes	Settlement + property plots + roads + hydrography
Photographies à haute altitude	1933, 1949, 1952, 1999	Mesoscale	Yes	Settlement + plots of land + roads + hydrography + vegetation + disappeared forms of landscape
Photographies à basse altitude	Aerial surveys since the end of the 1970s	Large	Yes (only for the identified sites)	Disappeared forms of landscape
Google Earth	2006	All scales	Yes	Settlement + plots of land + roads + hydrography + vegetation + disappeared forms of landscape
Bing Maps	2010	All scales	Yes	Settlement + plots of land + roads + hydrography + vegetation + disappeared forms of landscape
<i>Carte Archéologique de la Gaule</i> and data base “Patriarche”	1991 (CAG) and 2012 (Patriarche)	Very large	Yes	Archaeological sites
Excavation reports	End of the XX <sup>th</sup> c.	Very large	Yes or No	Archaeological sites
Written sources	Second Middle Ages and modern period	All scales	No	Varied information (obtained in the study of Pierre Poilpré (2010) and in the literature)



**Figure 2.** The layout of the ancient way between Rennes and Angers north of Nouvoitou. Contemporary forms of the road network and of the municipal boundaries keep the memory of this layout (cf. pink arrows) although the shaped forms have changed. Source: IGN, 1:25 000 scale topographical map.

In the modern period, Annie Antoine (1999: 181) also observes in her research at the archives of the department of Mayenne that “traffic is highly volatile: a layout is easily abandoned for another easier to practice at some point.” Nicolas Verdier (2007: 15-16), a specialist of modern roads, confirms this observation:

[...] when a path between two points was bad, the actors of the eighteenth century used the ‘long-haired roads’ [*chevelu des routes*’ in French]. This was a time when, as Franck Imberdis wrote in his thesis on the roads of Auvergne, the French road network consisted of a set of dirt tracks, ‘all substantially equivalent, and some of which were roads because long distance traffic borrowed them in preference to others. Sometimes, depending on soil conditions and the needs of the moment, trade relations abandoned such a way to another; often also, they simultaneously shared two parallel paths’ (1967, p. 234). (Verdier 2007: 15-16)

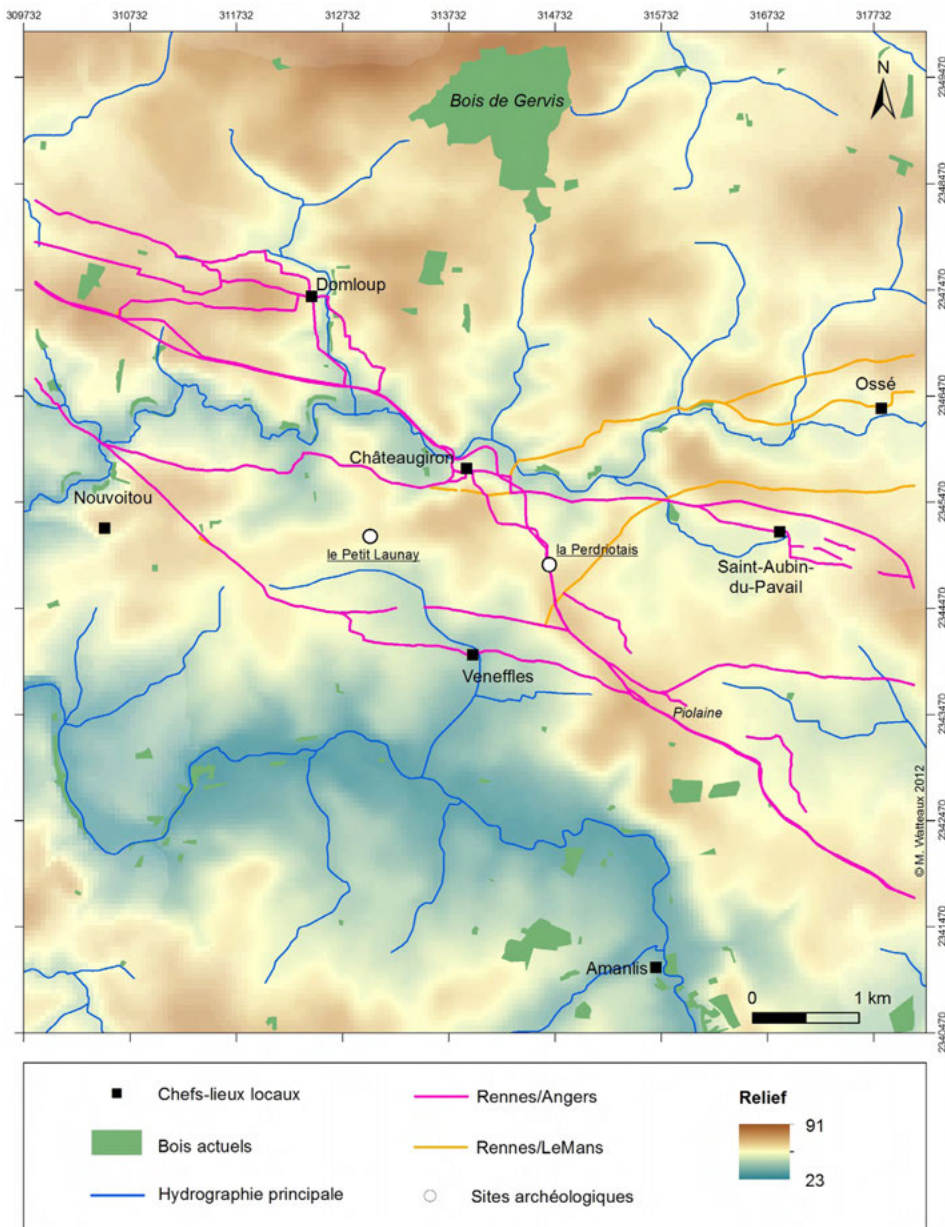
Finally, remember that Cassini himself wrote in the eighteenth century that the secondary routes are very numerous because they “vary seasonally” (Pelletier 1990: 108). Consequently, our morphological drawings of multiple layouts in the same itinerary are well aware of this diverse and labile reality.

### 2.3 To Investigate the History of Each Road Layout

For each identified layout, we have to try to understand its history or, at least, some moments of its history. For this, we study:

- The connected and crossed centres: the history of these settlements (when they are known) allows us to make assumptions about the history of the paths that connect them.
- The general shape of the layouts: straight or not, any detours, etc.
- Their preservation in the current landscape: farm path, road, hedge, limit of parcel, etc.

- How they stand out in the forms of landscapes, that is to say their relationship to the plots: are they well integrated into the system of plots or do they intersect it?
- Their relationships with the municipal boundaries, with topography, hydrography, geology: are they support for administrative boundaries? Are they coherent with the topography? What are their relations with geological formations?
- Their name on the Napoleonic cadastre: this verification sometimes allows us to identify some destinations more distant than the neighbouring village.
- The cartographic, historical and archaeological evidence, which allow us to consider the chronology of these layouts.
- Literature about them: to take stock of our knowledge for each layout already known.
- The various existing variants: as we already said, an itinerary can have several layouts that change over time because of the changes in the network of settlement or for other reasons.



**Figure 3.** The layouts entering the itineraries Rennes/Angers and Rennes/Le Mans in the study area. Source: Watteaux 2013: 238.



Then the cross-analysis of all these observations allows us to propose a chronological reading that aims to understand the temporal sequence of the different layouts within the same itinerary. Ultimately, we can hope “to trace the main outlines of the history of the road network” (Vion 1989: 87-97). The major clues available to date these layouts and itineraries are the histories of the connected and crossed settlements. Caution is needed, however, because, as pointed out Samuel Leturcq (1997: 82), it is difficult to say, on this only basis, that the exact location of such current or sub-current path matches precisely with the former path. For this reason, it is better to speak about “bundles of evidence” rather than certain dating.

However, although it is obviously wrong to apply a continuous transmission of the shaped form while it is experiencing constant and multiple transformations, it is permissible to consider that a layout continues if one accepts that this transmission occurs in the change of the shaped forms. This is the concept of “transformation” coined by Gérard Chouquer (2007: 181-183) from the assembly of “transformation” and “transmission”. This neologism describes the dual action of transformation over time of the geographical realities and of transmission of certain characteristics of these realities that gives the impression of resilience of the form. It would be too simplistic to consider the transmission of road layouts only from the angle of the transmission of their direction, which would mean that only the itineraries are transmitted and never the layouts within them. Obviously, this does not exclude the possibility of cautiously discussing dating hypotheses: they are often widely criticized, but they represent a source of reflection for move forwarding on these issues and on the history of territories.

### 3 Results: The Example of the Itinerary Rennes/Angers Around Châteaugiron (Brittany)

This methodology has been implemented on an area of 80 km<sup>2</sup> around the small town of Châteaugiron in Brittany, located in the Rennes basin (cf. Figure 4). This study sector encloses the nearest municipal capital towns near Châteaugiron: Ossé, Saint-Aubin-du-Pavail, Amanlis, Nouvoitou and Domloup. This sector also

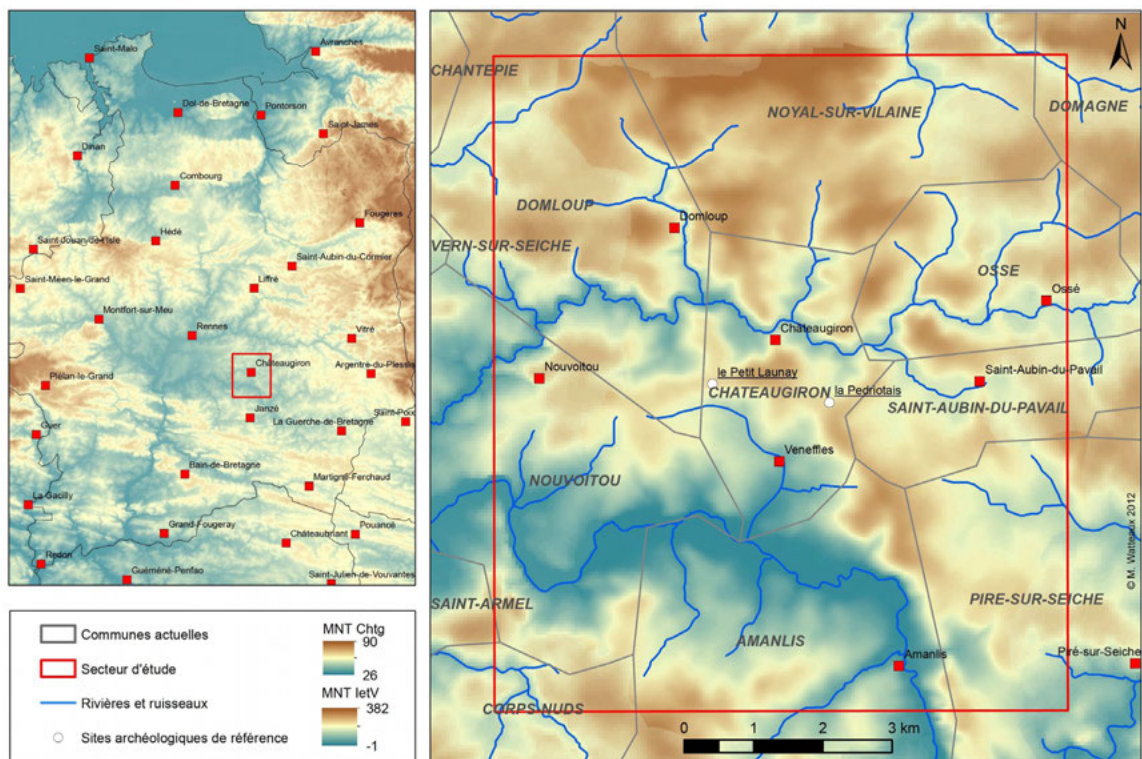


Figure 4. The study area. Source: Watteaux 2013: 199.

encloses a part of the municipalities of Piré-sur-Seiche and Noyal-sur-Vilaine, whose capital towns, however, are outside the study area. Between these places, we find a multitude of hamlets and isolated farms typical of the “bocage” landscape in western France.

Here the topography is, as in the entire Rennes basin, gently undulating and does not reach 100 m. The main rivers are the Seiche and the Yaigne that stretch from West to East, except for an inflexion of the Seiche to the South at the hamlet of Laval. Finally, due to its geographical position, the Rennes basin is a natural corridor passage between the Parisian Basin and western Britain on the one hand and between the Atlantic and the Channel on the other hand (Provost and Priol 1991: 67).

Historically this area belonged first to the Gallic people of *Riedones*, then to the ancient Gallo-Roman *civitas* of the same name (Pape 1995: 20-21). The pedestrian and aerial surveys show that this region, particularly in the Seiche valley, was densely occupied in these ancient times. It seems that the Gallic tradition, characterized by the model of the “native farm,” was particularly strong, delaying the effects of cultural and technical Romanization (Gautier, Jumel and Leroux 1991: 62; Gautier et al. 1991a). Recently, a large archaeological site was excavated on 20 hectares at about 800 m south of the medieval centre of Châteaugiron in the context of the construction of a housing estate at La Perdriotaïs (Catteddu 2013). These excavations conducted by Isabelle Catteddu for INRAP in 2008-2009 have revealed the existence of a rural settlement occupied quite continuously from La Tène up to the tenth century, whose main phase dates from the early Middle Ages (cf. Figure 5). Many paths serving the site have also been unearthed (in brown on the figure). It is in this context that an archaeogeographical study was conducted between February and August 2012 (Watteaux 2013).



**Figure 5.** Early medieval phase of the archaeological site of La Perdriotaïs (site A). Excavations: I. Catteddu; DAO: M. Dupré). Source: Burnouf and Catteddu 2015: 24.

In this paper, I will take the example of the itinerary Rennes/Angers because it is the best-known itinerary in this area and because it plays a central role in the history of this territory. I will present the different “long course paths” (*‘chemins de grand parcours’* in French) that over time composed this itinerary, that is to say the main layout at a particular moment in history. The study of these “long course paths” offers a useful interpretive key to understanding the evolution of the map of settlement.

### 3.1 A Strategic Ancient Road Between Rennes and Angers

The ancient road of this route has been known in the literature for a long time (Orain 1882: 96; Banéat 1927: 30-34; Matty de la Tour 1873 quoted in Leroux and Provost 1990: 133; Éveillard 1991: 22). It connected *Condate*, the ancient city of the *Riedones*, to *Juliomagus*, the ancient city of the *Andecavii*. This important road is represented on the Peutinger’s Tabula<sup>5</sup> where it passed by *Sipia*, which is assimilated almost unanimously into *Visseiche* (*Vicus Sipia*) (Banéat 1927: 4; Éveillard 1991: 22; Pape 1995: 82).<sup>6</sup> This road is therefore now quite well known. It seems to have been built during the first phase of the development of the road network of the Roman Empire. It represented an axis of penetration from Angers westward to link the Atlantic Ocean to the rest of Roman Gaul via the route Lyon (*Lugdunum*)/Angers (*Juliomagus*) (Pape 1995: 97-98; Menez and Hinguant 2010: 79). It was a response to the Romans’ strategic goal to integrate the Breton province into the province of Lyonnaise (Antoine and Lagrée 2001: 10).

Inside the investigated area, this Roman road was passing south of Châteaugiron, with a global direction NW/SE (cf. Figure 6, layout n° 1 in green). As is usual for great ancient strategic routes, the Romans favoured the high ground protected from wetter areas. It is still easily visible by air and in the forms of the landscape, and it has even been excavated near the farm of the Grand-Launay (cf. Figure 7) in the nineteenth century by Alfred Ramé (Banéat 1927: 32-33; Leroux and Provost 1990: 68). It was made of a lower layer (thickness: 0.17 m) with “medium and small, sloping and furnished with soil” stone foundations and of an upper layer (thickness: 0.19 m) with crushed stone and soil. A few hundred meters to the east, on the site of La Perdriots, we observe that the Gallo-Roman structures are mainly spread southwards, closer to the ancient road.

This ancient road is no longer visible on maps of the eighteenth century. We obviously cannot infer that it totally disappeared at that moment. Because the layout is not a long course path, it just was not figured on these small-scale maps. Therefore, it could have continued to exist in the form of local roads but not on its entire route. This is what we see on the Napoleonic cadastre, where it actually partially melted into the local road network, and on the ground as near the farm La Houssais (cf. Figure 8).

The relationship between this ancient route and the agglomerate settlement shows a clear discrepancy: the way does not serve any of the supposed medieval boroughs (Nouvoitou, Veneffles, Châteaugiron, Chantepie, Piré-sur-Seiche). This testifies to the antiquity of the road and to the fact that it was not morphogenetic<sup>7</sup> for the settlement in this sector. Perhaps this is because the road was less used at the time of the foundation of the settlements, or because the reasons for their development were not related to the proximity to the road, which could have been sufficient. On the contrary, this old layout is remarkably integrated into the plots of land because all plots rely on it, which shows the importance of this axis in the planimetric history of the area. However, on a short section northeast of Nouvoitou, the road is no longer morphogenetic because it cuts the plots of land. Yet, it is always morphogenetic for the

<sup>5</sup> It is a medieval copy (thirteenth century) of an ancient road map showing the main road network and the major cities in the Roman Empire.

<sup>6</sup> However, recent excavations at Visseiche have bring new elements that could invalidate the existence of a *vicus* in the Gallo-Roman period: “The lack of earlier remains that the early Middle Ages in the plots studied is also a further indication for questioning the existence of a *vicus* in Roman times. In fact it could be a simple *mansio* installed near the Rennes-Angers road, near a bridge that crossed the Seiche” (Le Boulanger 2004: 2).

<sup>7</sup> A morphogen is a permanent or important element of a landscape that can constrain the orientation of new forms, more or less time after its implantation. The morphogen is therefore an important agent of transformation of the landscapes (Cf. online dictionary of archaeogeography: <http://www.archeogeographie.org/index.php?rub=presentation/dictionnaire/>).

territorial network. Indeed, this ancient road coincides in many places<sup>8</sup> with municipal boundaries – formerly parish boundaries – which is a phenomenon well known to archaeologist-historians. These observations show the oldness and the strong resilience of this layout and its importance in local history.

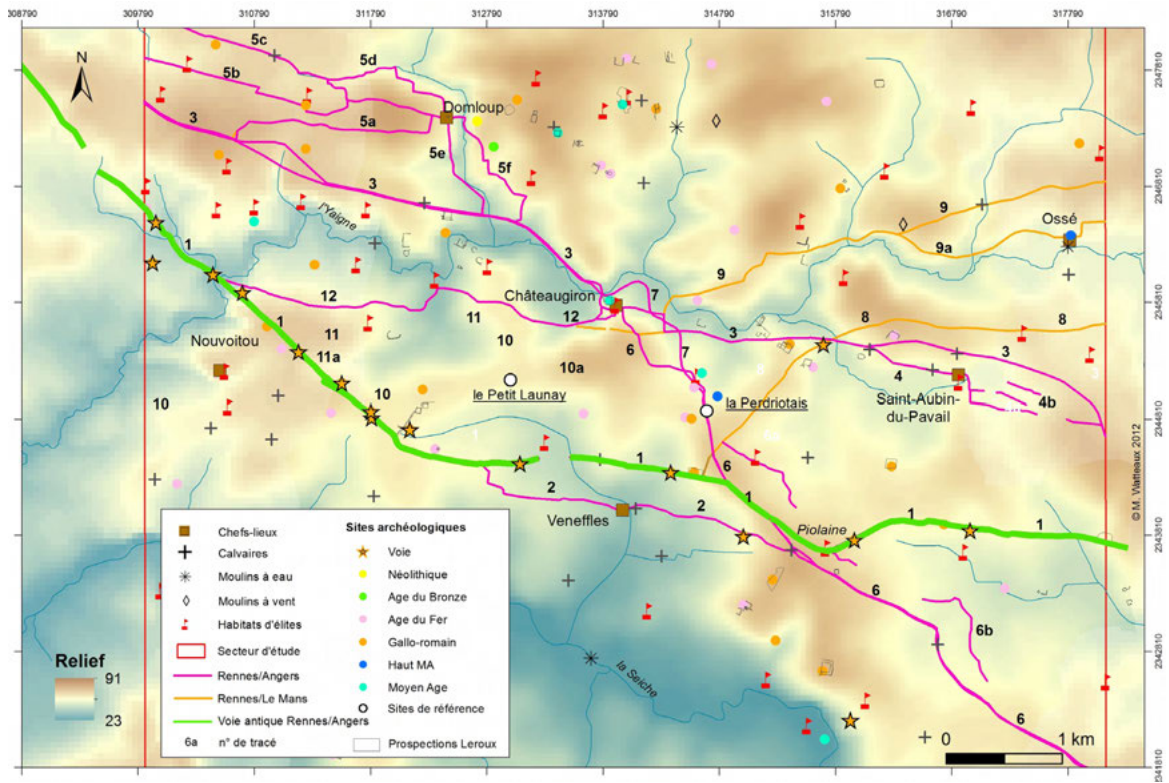


Figure 6. The layouts of the itinerary Rennes/Angers in the study area. Source: Watteaux 2013: 240.

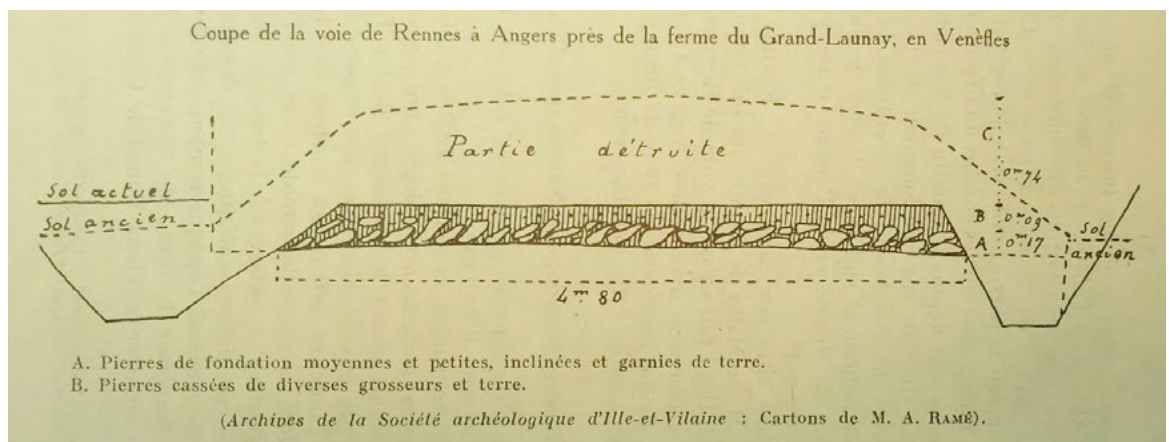


Figure 7. Excavation of the supposed ancient road Rennes/Angers by Alfred Ramé near the farm of the Grand-Launay. Source: Banéat 1927: 33.

<sup>8</sup> Between the municipalities of Domloup and Nouvoitou, Saint-Aubin-du-Pavail and Châteaugiron, Amanlis and Piré-sur-Seiche, and Chantepie and Vern-sur-Seiche.



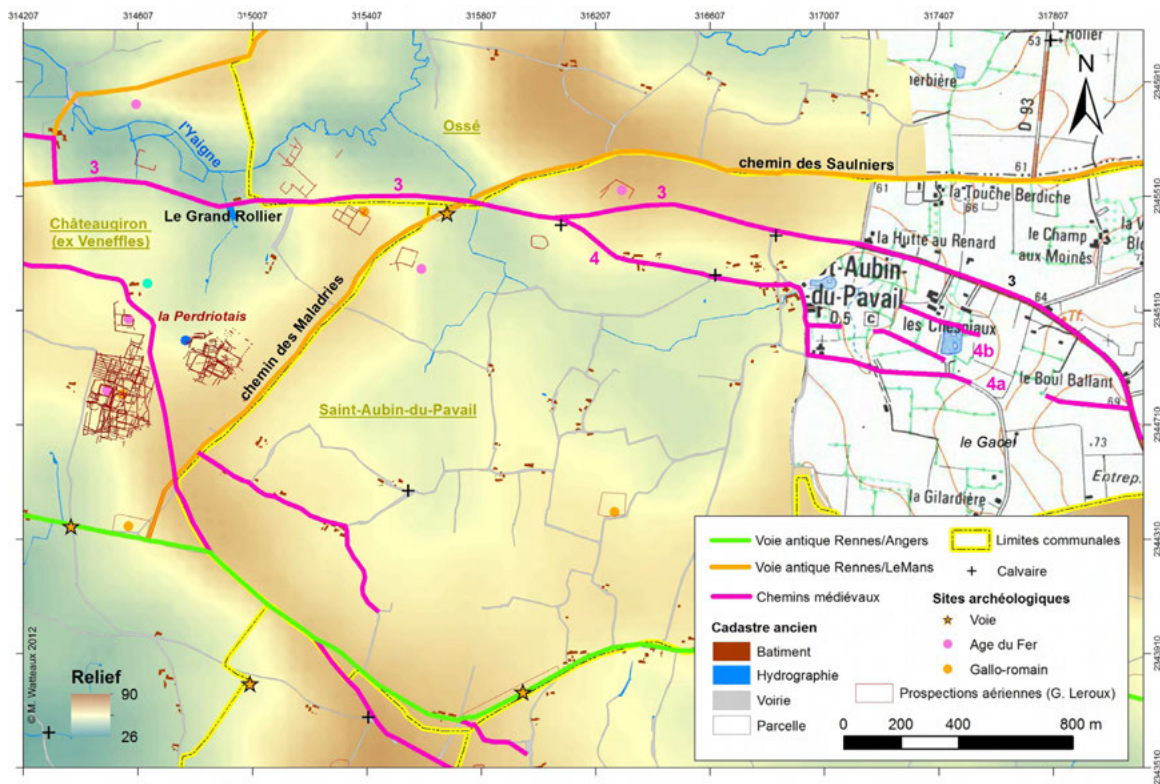
**Figure 8.** The current shape of the ancient road Rennes/Angers (here, in the extension of the trail from the farm of La Houssais towards north-west). © M. Watteaux 2012.

### 3.2 Medieval Period: Between Continuity and Bifurcation of the Layouts

In the early Middle Ages, one can suppose a one-time capture of the ancient road through the village of Veneffles (cf. Figure 6, layout n°2), an old rural village south of Châteaugiron. Unfortunately, archaeological data are lacking on Veneffles. We just know that it was a very old parish, older than Châteaugiron, whose territory was formed at the expense of Veneffles. Pierre Poilpré, in his archival study, showed that the parish of Veneffles was a creation of the early Middle Ages, because of the archaic dedication of its church to St. Medard (Poilpré 2010). Indeed, Saint-Médard was a holy bishop (of Soisson) whose worship spread very

quickly after his death in the VI<sup>th</sup> century and during a brief period of 300 years. Can we conclude that the ‘capture’ of the ancient layout in this sector, at the level of Veneffles, could have taken place during the early Middle Ages (sixth to tenth centuries)? We do not have the necessary arguments to move beyond this assumption. This does not exclude that there was previously a less important settlement at Veneffles, but it was not significant enough to capture the layout of a supra-regional scale route. At the scale of the entire layout of the Roman road, we can only presume its continuity during the early Middle Ages without being more precise.

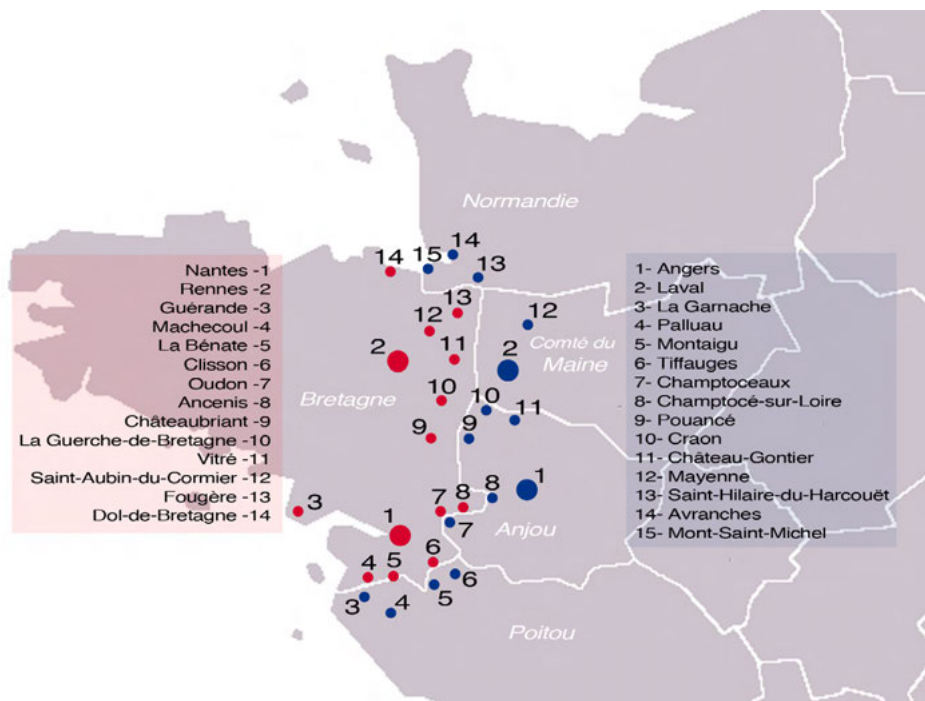
During the second half of the Middle Ages (XII–XVI c.), this ancient road is clearly captured by the town of Châteaugiron (cf. Figures 6 and 9, layout n°3; current RD 463), whose castle was founded in the early eleventh century by Anquetil with the permission and order of Alain, Duke of Brittany and Count of Rennes Alain, as a reward for Anquetil’s loyalty (cf. Figure 10) (Chêdeville and Tonnerre 1987: 154; Poilpré 2010: 3–6). From a strategic point of view, it was necessary to connect Rennes to Châteaugiron, which was part of the second line of defence on the steps of Brittany between Rennes and the main cities of the frontline (Fougères, Vitré, La Guerche, Châteaubriant) (cf. Figure 11). Pierre Poilpré (2010: 6) notes that the location of the castle of Châteaugiron, about 15 km southeast of Rennes, 1.7 km from the ancient road Rennes/Angers and about 1.5 km from the supposed ancient road Rennes/Le Mans, was an ideal observation point for guarding against attacks from the counts of Nantes, Anjou’s allies: “Thus the castle of Anquetil and his sons appears to be integrated to the movement of the creation of a relay network of the Count’s power in the countryside around Rennes in the eleventh century” (Poilpré 2010: 5). Therefore, its territory was attached to a considerable power: it was one of the nine oldest baronies of Brittany and the lords of Châteaugiron were captains of the castle of Rennes by birthright and advisors and great chamberlains of the Duke of Brittany (Ogé 1979: 172; Martineau 1997: 4). The history of the barony and the castle, therefore, was closely linked to that of the Duchy of Brittany.



**Figure 9.** Supposed Gallic and Roman pens around the farm of Le Grand Rollier discordant with the great medieval path between Châteaugiron and La Guerche (layout n° 3). Source: Watteaux 2013.



**Figure 10.** The castle of Châteaugiron. Source: © Ville de Chateaugiron, Travail personnel, CC BY-SA 4.0, 2012. On line: <https://commons.wikimedia.org/w/index.php?curid=39464079>



**Figure 11.** Strong points on the “Breton Marchlands”. Source: Cyril5555, from OwenBlacker, 27 novembre 2010. On line: [https://fr.wikipedia.org/wiki/Fichier:Fortresses\\_marches\\_de\\_Bretagne.png](https://fr.wikipedia.org/wiki/Fichier:Fortresses_marches_de_Bretagne.png)

Finally, from an economic standpoint, Châteaugiron became a stage on the road of Anjou, a major route of the wine trade from the late Middle Ages (Leguay 1981). Despite this, Châteaugiron never became an important city. Jean-Pierre Leguay (1981: 48) describes it as a “semi-rural town” at the end of the Middle Ages.

In the study area, the layout of this medieval route supported communal boundaries and the largest section of the layout, which is outside of our sector and around Moulins, coincides with the ancient road. This demonstrates that this layout is newer than the delimitation of the boundaries of the old parishes, which were partly supported on the Roman road. The discovery by aerial survey of supposed Gallic and Roman pens near the farm of Le Grand Rollier to the west of Saint-Aubin-du-Pavail validate this dating (cf. Figure 9). Indeed, these pens are not at all oriented along this great medieval path but along the ancient road of Rennes to Le Mans. They even seem to intersect this medieval path, which gives us a *terminus post quem* for the path that confirms the medieval dating that the historical study of Châteaugiron and La Guerche – two of the urban centres served – already has allowed us to propose.

Because the phenomenon of capture does not occur immediately, we can propose a very broad dating period that spans between the eleventh and the thirteenth centuries. Indeed, in the thirteenth century it seems certain that the road already passed by Châteaugiron because the regional capital, Rennes, had to be connected to its cities' "borders" on the "Breton Marchlands". Châteaugiron's development has inevitably led to the neglect of the ancient road, except on certain sections where it remained helpful and did not contravene the service of the most important market towns. This is the case outside of our sector between Moulins and Visseiche where the old medieval path takes the ancient way (cf. Figure 12). The need to connect Rennes and Angers, capitals of Brittany and Anjou, as directly as possible is always present, but the layout adapts to the main centres in the near surroundings of the ancient Roman road (Chantepie, Châteaugiron, Moulins, Visseiche and La Guerche). Thus, we can suppose that the layout of this great medieval path had been gradually created, phased in order to make the Rennes/Angers route consistent with the new settlement map. First the layout developed close to the oldest conglomerate sites during the early Middle Ages, then it reformed in accordance with the boroughs created from the eleventh and twelfth centuries such as Châteaugiron. The new route adapted to the new realities of the map of medieval settlement while remaining in the "domain of attraction" of the itinerary Rennes/Angers.

However, the road does not cross the village of Saint-Aubin-du-Pavail whereas this village is on the way to Angers. The medieval layout was about 150 m to the north, marking a slight indentation in the west and east, which suggests that this workaround is voluntary. This is already the case on maps of the eighteenth century. Yet the Napoleonic cadastre and also the current map at 1/25000 show a local path that connects Châteaugiron with Saint-Aubin-du-Pavail (cf. Figures 6 and 9, layout n°4). The junction with the road from Rennes to La Guerche via Châteaugiron is also marked by a calvary. Just out the eastern village, today this local path branches to the south and seems to disappear. However, there are some plots of land to the east and southeast of the village that could match an old path (cf. Figure 9, sections n°4a and 4b), which would extend the previous path to the current departmental road n° 463 to La Guerche, at the farm of Boul Ballant. This raises the question: Would the medieval long course path from Rennes to La Guerche once have served Saint-Aubin-du-Pavail before it diverged? This seems possible, especially considering the place name "Pavail" that suggests the presence of an old way (although this path may be the old "path of Saulniers" located just north). The possible reasons for the abandonment of the path are difficult to understand: did the crossing of this very small chief town slow traffic without any trade compensation (too modest of a locality)? When we look at the topography, however, we prefer the geographical hypothesis. The village is indeed crossed by a rivulet that extends east to the farm of Chesniaux. So the path would have avoided this little wet depression by passing through the hills to the north.

This medieval (then modern, see Section 3.3) long course path within and outside of the study sector appears to be composed of varied chronological sections (cf. Table 2 and Figure 12):

- Section in Rennes: ancient origin? (upon further confirmation by a detailed study)
- Section of Rennes until about 2 km northwest of Moulins: from the eleventh to the thirteenth century, if we use these dates for the birth and development of the market towns served.
- Section northwest of Moulins to Visseiche included: section that takes the layout of the ancient road.
- Section from Visseiche to La Guerche: we can hypothesis a capture of the ancient way between the ninth and eleventh centuries considering the probably older origins of Visseiche and La Guerche.



**Table 2:** Temporality of the sections composing the road layout Rennes/La Guerche.

Sections of the layout	Beginning	End	Total
Rennes	early Roman Empire	Today?	± 2000 years?
From Rennes to the north-west of Moulins	XI <sup>th</sup> -XIII <sup>th</sup> c.	Today	± 7-8 centuries
From the north-west of Moulins to Visseiche included	early Roman Empire	Today	± 2000 years
From Visseiche to La Guerche	Between IX <sup>th</sup> - XI <sup>th</sup> c.?	Today	± 11-12 centuries?

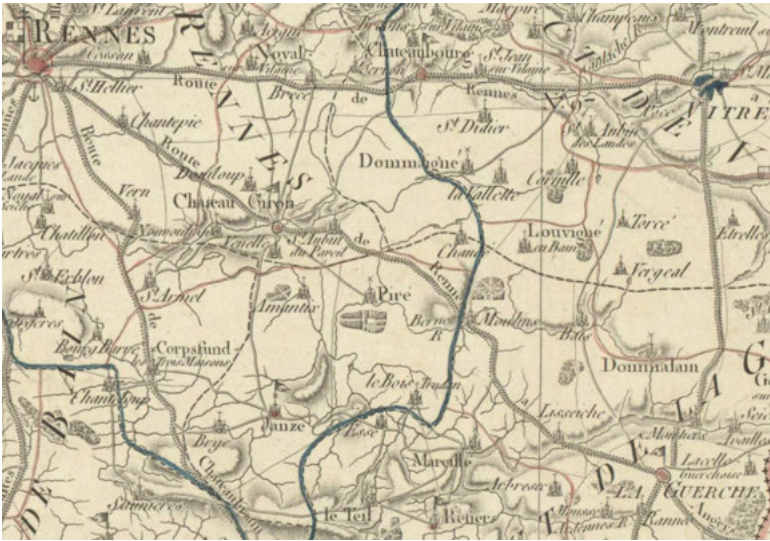


**Figure 12.** Detail of the successive “long course paths” inside the itinerary Rennes/Angers. Source: Watteaux 2013: 245.

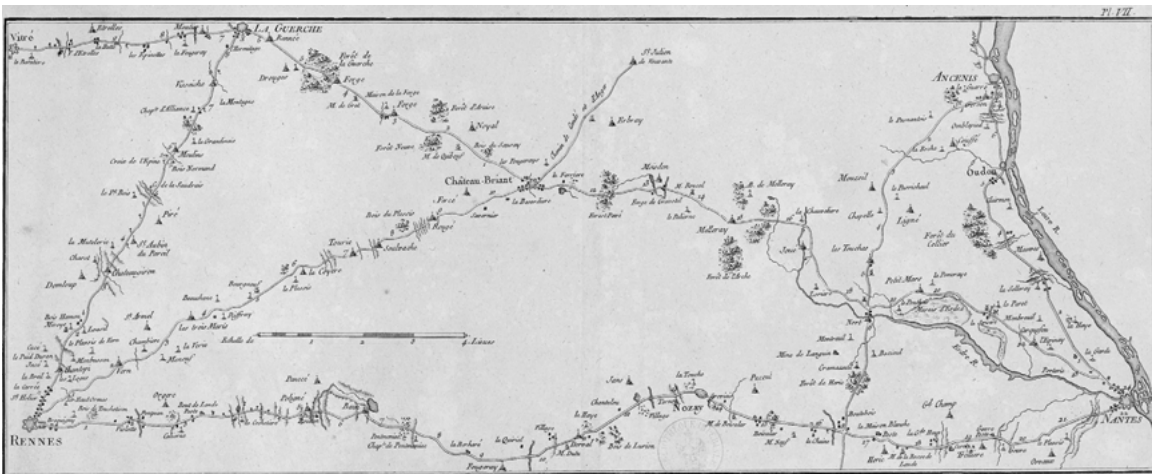
### 3.3 Modern Period to the Present Day: An Itinerary Decline

During the modern period this road continued to be used up until today. It is described as the “road from Rennes to Angers” on the *National Atlas* at the end of eighteenth century (cf. Figure 13) and as the “Road from Rennes to La Guerche” on maps and cadastral maps of the nineteenth century. The place of Châteaugiron indeed seems minor on this route, in particular because of the importance of La Guerche, which plays a major role in defending the borders of Brittany (Chédeville and Tonnerre 1987: 151; Cassard et al. 2008: 339; Cintré 2011: 18). For this reason the seventh board of the *Atlas itinéraire* of Ogée (1769) maps Châteaugiron as a simple little step, equal to many others, while Rennes and La Guerche are figured with two special symbols that distinguish them from other cities (cf. Figure 14). In the *Dictionnaire historique*

et géographique de la province de Bretagne of Ogée (1799: 170-172), Châteaugiron is designated as a “small town” “on the road from Rennes to La Guerche”. Finally, in 1760, the archives tell us that this road was so bad that the merchants and the carriages could safely use it during the winter months (Nières 2004: 48).

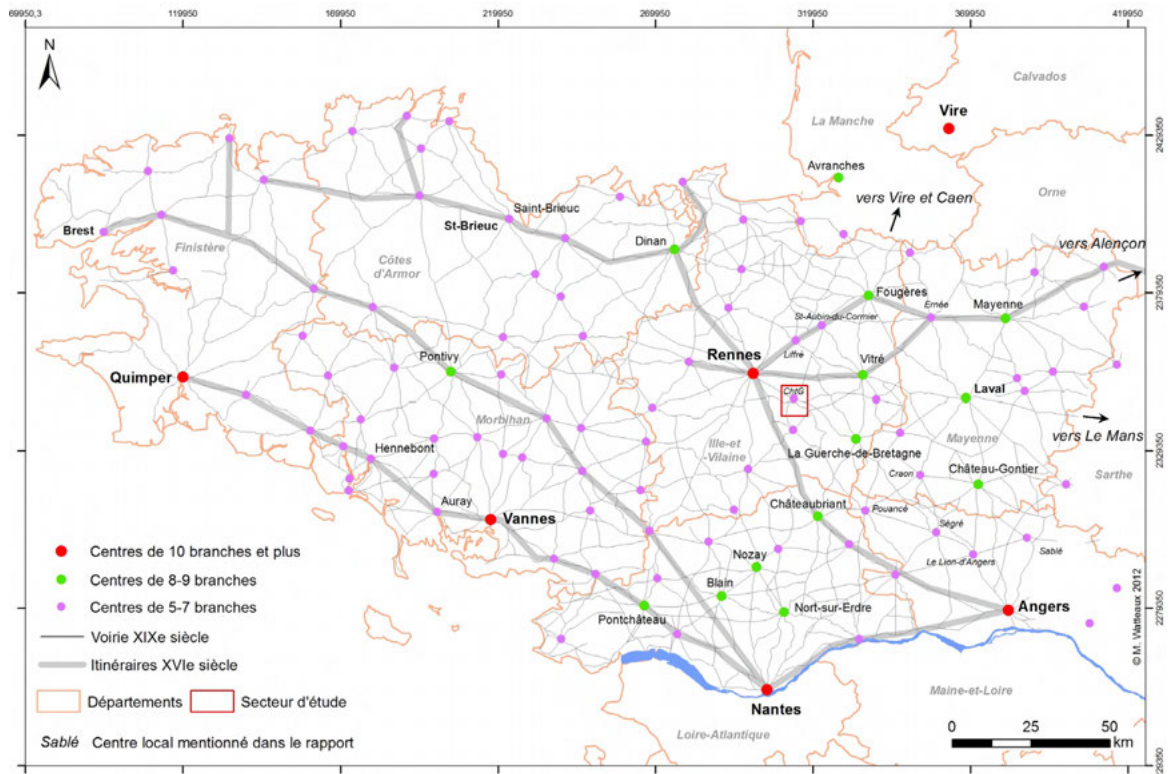


**Figure 13.** The main road between Rennes and Angers on the *National Atlas* of Dumez and Chanlaire at the end of the eighteenth century. Source: Departmental Archives of Ille-et-Vilaine, Pierre Dumez et Pierre-Grégoire Chanlaire, feuille n° 31 de l’*Atlas national*, « Département de l’Ille-et-Vilaine », 5 Fi 132, Paris, 1790.



**Figure 14.** Board n° 7 of the *Atlas itinéraire de Bretagne* d’Ogée (1769) mapping the great paths from Rennes to La Guerche, Châteaubriant and Nantes. Source: BNF, Jean-Baptiste Ogée, « *Atlas itinéraire de Bretagne* contenant les cartes particulières de tous les grands chemins de cette province avec tous les objets remarquables qui se rencontrent à une demi lieue à droite et à gauche. Dédié à Nosseigneurs les États de Bretagne par leur très humble et très obéissant serviteur Ogée, ingénieur des Ponts et Chaussées », Ge DD 5625, planche n° 7, Paris, 1769.

We know thanks to Charles Estienne (1552) and his *Guide des Chemins de France* that since the mid-sixteenth century another great path existed, which connected Rennes with Angers through Corps-Nuds, Châteaubriant and Candé (cf. Figure 15). We find this other road on the maps of the eighteenth century. Châteaubriant and Candé were important strong points founded in the early eleventh century concerning Châteaubriant (Chédeville and Tonnerre 1987: 149). On the *National Atlas* (1790-1795), the two routes are drawn, one by Châteaugiron and La Guerche and one by Châteaubriant and Candé. So there were two great competing layouts during the modern period (and probably also during the medieval period).



**Figure 15.** Routes in Brittany by Charles Estienne in 1552. Source: Watteaux 2013: 234.

Itineraries: *La guide des chemins de France*, Paris, 1552. On line: <http://gallica.bnf.fr/ark:/12148/bpt6k102662d>

Background map: *Atlas national illustré* de de V. Levasseur et A. Combette, 1852. On line:

[http://commons.wikimedia.org/wiki/Category:Victor\\_Levasseur\\_%28cartographe%29?uselang=fr](http://commons.wikimedia.org/wiki/Category:Victor_Levasseur_%28cartographe%29?uselang=fr)

In the mid-nineteenth century, it is the latter road by Châteaubriant that is clearly the main road. It is described as a “royal road” on the map of Etat-Major (1846-1847). We might hypothesize a certain economic decline of Châteaugiron and La Guerche around the beginning of the eighteenth century due to the slowing of the trade of the “noyales” (boat sailcloth), which fuelled the prosperity of these cities since the late sixteenth century (Garnier 1902: 219; Bérenger and Meyer 1976: 119; Croix 1993: 162; Cassard et al. 2008: 148). Afterwards, agricultural trade backed the only source of income and trade. Finally, Châteaugiron was definitively pushed aside from the main flow between Rennes and Angers after the decision was made to extend the railway between Rennes and Châteaubriant through Corps-Nuds rather than Châteaugiron, which was less populated. The creation of a tramway in 1898 (*Association historique...* 2012) was less important economically than the railway and was not enough to halt the decline of the simple rural town that was already Châteaugiron during the modern period, especially because this tram line did not go up to Angers.

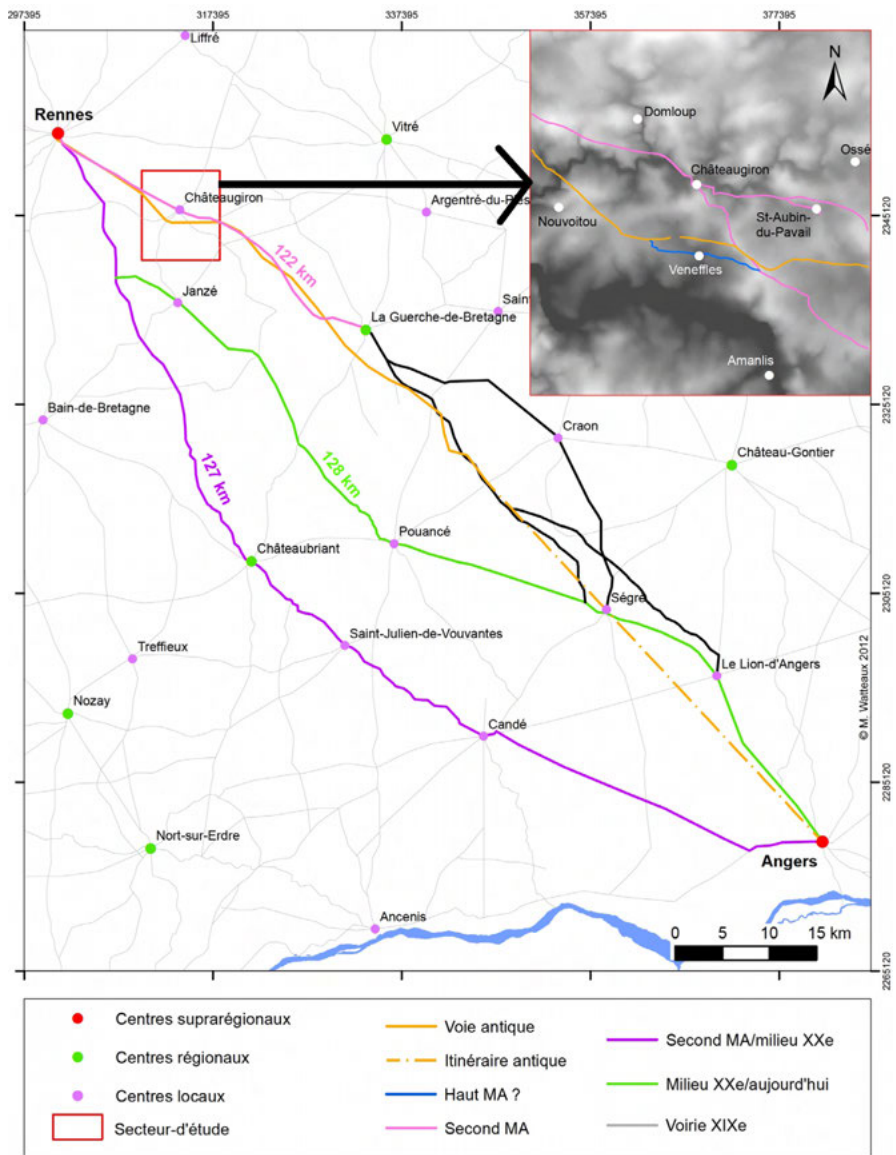
Today, the main layout from Rennes to Angers is through Janzé, Pouancé, Segré and Le Lion d’Angers (cf. Figures 12 and 16). Yet, on a 1935 road map of the department, the two main roads to get to Angers were always those that passed through Châteaugiron (via La Guerche) or Châteaubriant. So today Châteaugiron is no longer a step on the road between Rennes and Angers. More generally, the route Rennes/Angers is no longer an important route in Brittany and it is less resilient than others. The principal flows are observed rather between east and west (Paris/Rennes) and between north and south (Rennes/Nantes) due to economic dynamism. Symptomatically, the road from Rennes to Nantes is now a dual carriageway, whereas that of Rennes/Angers is only a standard road with rare dual sections. Châteaugiron has suffered from this loss of dynamism of the axis Rennes/Angers because it was a step on it and took advantage of the traffic.

### 4 Discussion: Storytelling of the Historical Dynamics of a Territory over the Long Term

These results show a heterochrony of the layouts that expresses the “pulsations” of the history of this route and of the map of settlement in this area (cf. Figure 16 and Table 3).

**Table 3:** Temporality of the different “long course paths” inside the itinerary Rennes/Angers.

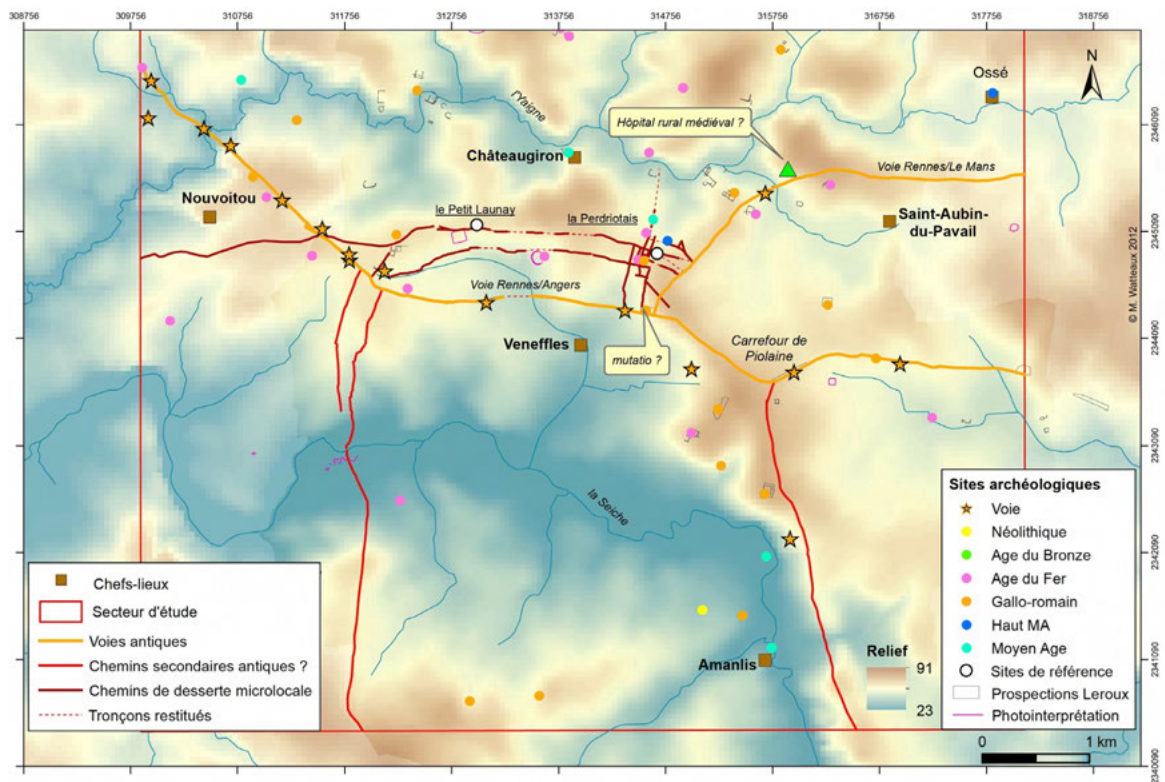
Layouts	<i>Ante-quem</i>	<i>Post-quem</i>	Total
Roman road southern Châteaugiron (n°1)	early Roman Empire	± X <sup>th</sup> -XII <sup>th</sup> c.	± 10 centuries
by Rennes/Châteaugiron/La Guerche (n°2)	XI <sup>th</sup> -XIII <sup>th</sup> c.	XIX <sup>th</sup> c.	± 7-8 centuries
by Rennes/Châteaubriant	XI <sup>th</sup> -XIII <sup>th</sup> c.?	Milieu XX <sup>th</sup> c.	± 8-9 centuries
by Rennes/Janzé/Pouancé	Milieu XX <sup>th</sup> c.	Today	± 50 years



**Figure 16.** “Long course paths” composing over time the itinerary between Rennes and Angers. Source: Watteaux 2013: 244.

#### 4.1 Before and at the Founding of Châteaugiron: A Historically Rich Territory

Before the founding of Châteaugiron, the two ancient ways linking Rennes with Angers or Le Mans crossed just south of Châteaugiron, about 300 hundred meters from La Perdriotais (cf. Figure 17). In particular, the itinerary Rennes/Angers seems to have represented an important engine of development for the sector between the Yaigne and the Seiche rivers, perhaps since La Tène. Indeed, a very high density of Gallic and Roman sites has been discovered in the valley of the Seiche (Gautier, Jumel and Leroux 1991: 62; Gautier et al. 1991a). Thus, the micro-sector of La Perdriotais is in an archaeologically and historically rich area because it represents a major traffic corridor in ancient times and probably during the early Middle Ages. The site of La Perdriotais cannot be understood without considering this road reality: the proximity of these two ancient roads not only had to promote the economic development of the site, but also had an impact on the morphology of the structures determined by the crossroads of these two roads just a few hundred meters further south (cf. Figures 17 and 18).



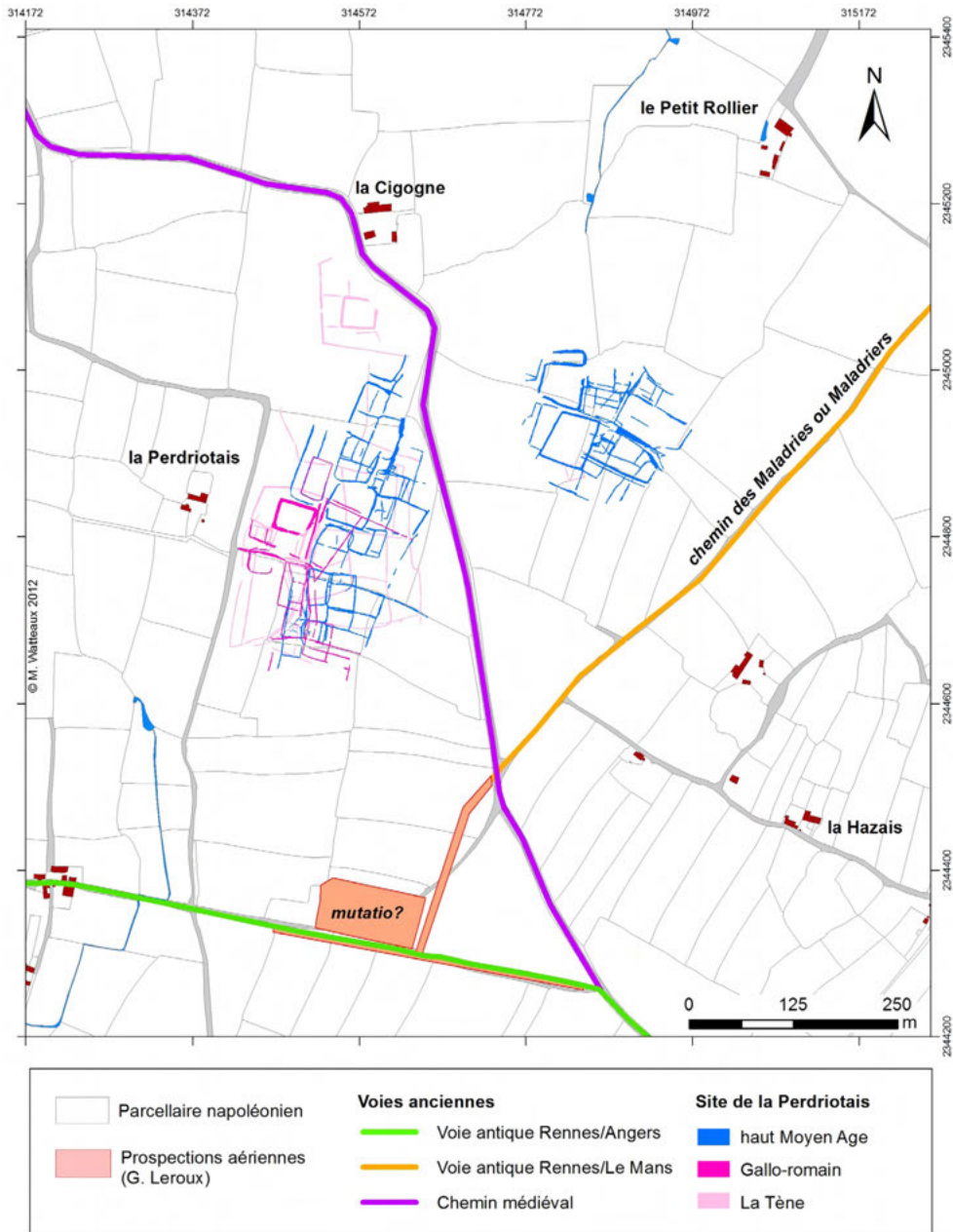
**Figure 17.** Proposal of restitution of the local Roman road network from the results of morphological analysis and archaeological data. Source: Watteaux 2013: 250.

This type of location near an ancient road is typical for the Gallo-Roman period in Upper-Brittany. In a study of the ancient sites of Upper-Brittany in the late 1980s and early 1990s<sup>9</sup>, archaeologists analysed the relationship between the Gallo-Roman sites and the roads (Gautier et al. 1991b: 194). Of all the ancient sites located within 1500 m of a Roman road (15.7% of Upper-Brittany sites<sup>9</sup>), the majority of sites are located between 0 and 500 m away from an ancient way. In the Rennes basin in particular, 60 % of these sites are within 500 m of a Roman road and 35 % within 100 m (Provost and Priol 1991: 76). Researchers deduce the “attractive effect played by the ways, with an obvious economic role” (Gautier et al. 1991b: 194). However, we can relativise the conclusions by saying that Rennes is a large road junction in the Gallo-Roman period,

<sup>9</sup> The project is called “Archaeology of the rural settlement in Upper-Brittany during Roman and pre-Roman periods”.

so the number of sites located at a respectable distance of a way is logically important in this area (Provost and Priol 1991: 76).

Anquetil's choice of the site of Châteaugiron at the beginning of the eleventh century was likely related to the proximity of this important ancient road and crossroad. Then the development of a market town at the foot of the castle led to the "capture" of these ancient ways and initiated the process of the polarization of the local road network by Châteaugiron. Although we cannot specify the exact relationship between the foundation of the castle, the subsequent development of the town and the abandonment of the early medieval hamlet of La Perdriots, it is possible that these events enter into resonance in the context of a reconfiguration of the settlement, of the powers map and, thus, of the road network.



**Figure 18.** The archaeological structures of La Perdriots are influenced by the two ancient roads Rennes/Angers and Rennes/Le Mans. Source: Watteaux 2013.

## 4.2 Following the Founding of Châteaugiron: Peak and Decline of a Small City

Across the investigated area, the city of Châteaugiron strongly polarizes the paths of neighbouring territories, showing its progressive influence since the eleventh century, which we see today (cf. Figure 19) or on the map of Cassini in 1785-1787 (cf. Figure 20).

At the intermediate scale (the Rennes basin), from antiquity to the present day Châteaugiron has remained in the area of influence of Rennes for several reasons: geographic proximity; step on an ancient supra-regional route between Rennes and Angers; historical loyalty to the Duke of Brittany whose Rennes was the capital; defensive site on the borders of Brittany, then step to La Guerche located on the first line of defence of the Marshlands; current economic relations, etc.

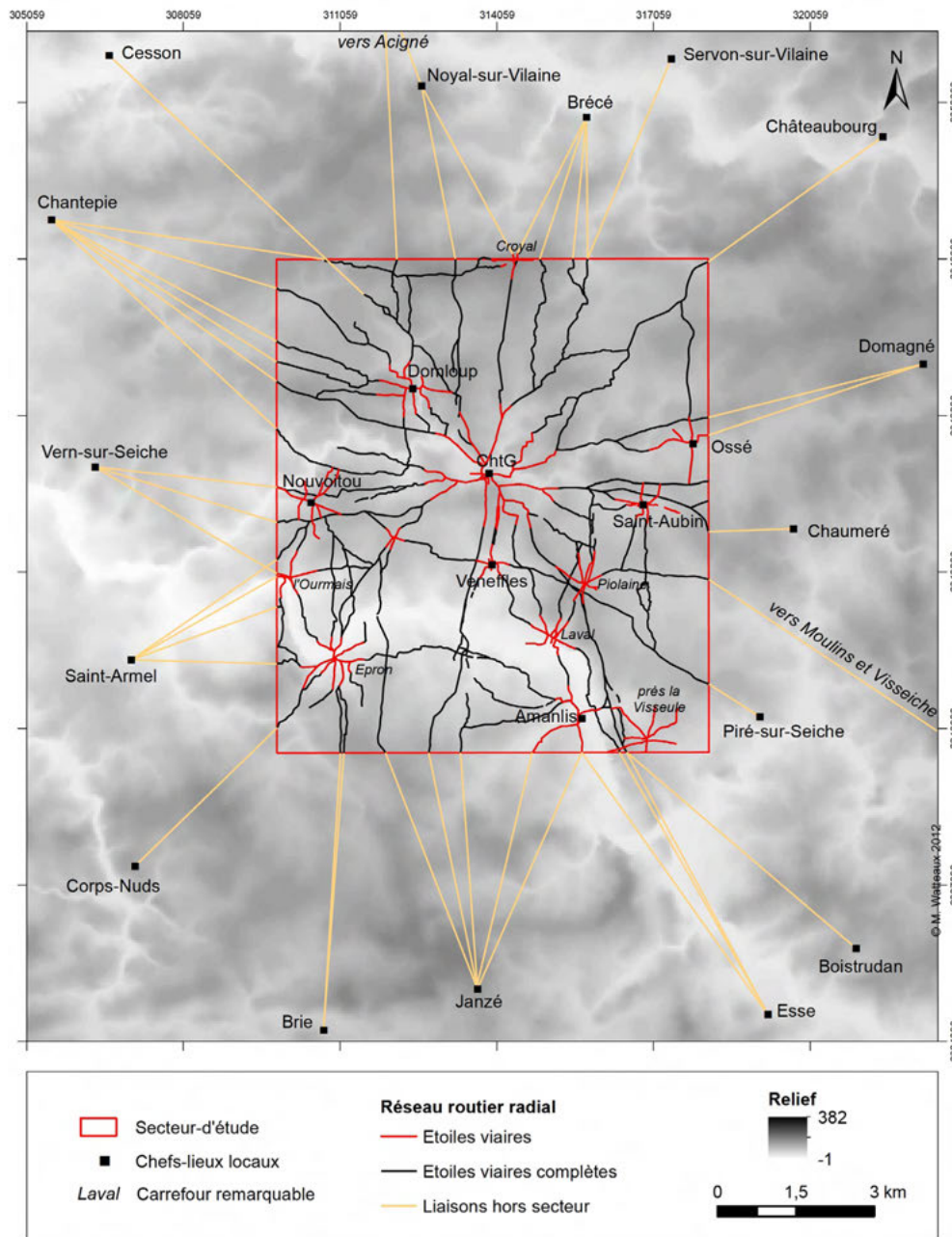


Figure 19. Local road network polarized by the market town of Châteaugiron. Source: Watteaux 2013: 236.



**Figure 20.** Cassini's map (1785) showing the polarization of the local road network by Châteaugiron. Source: *Carte de France* or map of Cassini, sheet number n° 129, 1785. On line: <http://cassini.ehess.fr/cassini/fr/html/index.htm>

At the regional scale, due to the rise of Vitré and La Guerche, Châteaugiron is only a local centre on a supra-regional-scale road whose logic escapes its control and that was supplanted by other centres from the late eighteenth century. More generally, the itinerary Rennes/Angers is no longer major. Currently the flows are deployed between east and west (Paris/Rennes) and between north and south (Rennes/Nantes). The axis Rennes/Angers, therefore, does not become as important and resilient as the two others axes Rennes/Paris and Rennes/Nantes, which has had a direct impact on Châteaugiron.

Today, the recent vitality of the municipality is due to the annexation of Veneffles' communal territory in 1971 and to the demographic and urban vitality of Rennes, whose extension benefits the surrounding territories.

Ultimately, we see that it is the history of urban competition, of the geography of powers and of the economy of trade that explain the shift of the different layouts that compose the itinerary Rennes/Angers in the *longue durée* (cf. Table 3 and cf. Figure 16). Châteaugiron and La Guerche capture an ancient Roman road



at the same time that they take a major place on the medieval settlement map. Châteaubriant and Candé get the “favours” of trade during the Middle Ages and prevail in the nineteenth century as the reference route. Finally, from the mid-twentieth century, the direct route by Janzé and Pouancé won, perhaps because Châteaubriant was no longer an important economic centre. This obviously does not mean that the way by Janzé and Pouancé did not exist before. It did exist, as we see it on the maps of the eighteenth century, but it was not then the main long course path between Rennes and Angers. Globally, what we observe through time is a phenomenon of displacement of the centre of gravity of traffic flows:

- At a local scale: displacement of the layouts from the surrounding of the Gallic, Roman and early medieval site of La Perdriots to the market town of Châteaugiron farthest north. We also observe this phenomenon for the axis Rennes/Le Mans (Watteaux 2013: 152-162).
- At a large scale: reinforcement of the traffic flows between east and west (Paris/Rennes) and between the north and south (Rennes/Nantes) at the expense of the itinerary Rennes/Angers.

### 4.3 To Conclude: About Yesterday... But also Today and Tomorrow

In conclusion, we see that the archaeogeographical analysis of road networks has helped to highlight some facts, from supra-regional to micro-local scale, which insert the study area into a wide geographical and historical set. This was made possible by the application of a methodology based on the morphological analysis of the forms of the landscape and by the crossing of numerous data in a diachronic perspective. Thus, we were able to reconstruct several possible road layouts for the same axis and to propose changes inside it over time.

However, our research often has stumbled against the problem of dating, a typical problem when working on the old roads. Usually – but not always happily – it is the history of the settlements served that guides the reasoning. Yet, our knowledge about these settlements is limited because the excavations at the heart of these market towns and villages are rare or nonexistent. Thus, the contribution of the early Middle Ages to this road’s history may be minimized, as this period is poorly documented concerning the settlement still in place (not for Châteaugiron, though). As Alain Provost and Alain Priol already reminded us in 1991, the ancient masonries discovered in medieval churches, the many dedications of the churches attributable to the early Middle Ages, and the low number of cemeteries originating from the Middle Ages discovered in the Rennes region “highlight a recovery or even a continuity of settlement sites. One can wonder if most of the early medieval sites are not the cause of our villages, making the surface readability obviously difficult” (Provost and Priol 1991: 79). It has been a well-known debate among medievalists for several years, which has demonstrated the importance of this period in the process of the formation of the “medieval village”, thanks to the development of preventive Archaeology (but outside our villages and market towns essentially) (Peytremann 2003; Watteaux 2003; Catteddu 2007; Carré et al. 2009). This ignorance, therefore, partly skews the reflexion on the history of old roads and paths. However, the formation of beams of clues, rather than a sure dating, allows us to propose coherent and useful hypotheses regarding the evolution of a particular itinerary.

Apart from a purely historical interest, this type of study can provide a tool for reflexion on the development of our contemporary territories. One of Marc Bloch’s convictions captures this mindset perfectly: “Ignorance of the past doesn’t simply impair our knowledge of the present; it compromises actions undertaken in the present” (Bloch 1997 [1949]: 11). In practical terms, this means making the people involved in development at the local level aware of the impact this heritage has on land management. It also valorises patrimonies of all kinds, including landscapes and territories (“matrimonies”) (Lavigne 2011, Lavigne 2014, and Lavigne 2015). This is the direction that a number of archaeogeographers have taken when they have proposed their services at the local level to developers, regional governments, and heritage managers. They have worked on their own (C. Lavigne, E. Cavanna), within regional agencies (M. Foucault for the office of urban archaeology of the city of Lyons), or on specific projects (Robert and Verdier 2014; Cavanna 2008). Their renewed attachment to sites, which archaeogeographers hold to, allows them to establish ties with local populations and to make people aware of the impact that choices made long ago, which is to say their heritage, have had on land management. In this way, the configuration of a landscape

is not simply a matter of its history. It becomes truly contemporary, a part of the present that influences the present, which is to say, us. The assimilated past to which land configurations bear witness is thus a memory that morphological research, refashioned by archaeogeography, can bring back from oblivion. Thus, historic roads are not reduced to a single story, but become a true contemporary material which can be used to think about the sustainability of our territories.

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