Towns and rivers, river towns: environmental archaeology and the archaeological evaluation of urban activities and trade*

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Twenty years of environmental archaeology in France. The relationship between towns and rivers: a case study of the Rhône and the Loire

Urban archaeology really started in France in the 1970s and experienced tremendous development during the 1980s, because of the expansion in rescue archaeology in ancient urban centers, particularly Lyons.1 The question archaeologists sought to answer was the “making of the town”: how did urbanization arise, which social groups, what powers had constructed this “object” which written sources did not even call a “town” until the middle of the thirteenth century.

From the mid-1980s, archaeologists specializing in the historical periods started to work in an interdisciplinary way with environmental scientists, highlighting the complex relationship between communities and the environment in which they have lived for the last 3000 years.2 They also benefited and drew inspiration from the research and analytical contributions of geographers,3 sociologists and anthropologists.4

Today the “urban fact” is regarded as a social construct inherited from a number of factors. The unintentional and unexpected result which is the making of a town is the product of a coevolutionary interaction of nature and culture. It is a “an unreflected space”,5 a socio-spatial construct.

Before the great expansion of urban archaeology, archaeologists as well as historians relied on the theories of the Belgian historian Henri Pirenne. At the beginning of the twentieth century, he linked the emergence of cities and their expansion to the international trade which started in the eleventh century. It was assumed that Roman cities had disappeared under the assault of the barbarian invasions, that the early Middle

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5 Lussault 1996.
Ages was unfamiliar with “towns,” and that those which existed, had shrunk to a much reduced area and were not even recognized as such. In the written sources even the term was lacking.6

Archaeological evidence shows that the ones Pirenne identified were not the only factors in the emergence of the “urban fact”. It is now established that medieval societies invented “towns” during the medieval millennium, and that their activities led to irreversible transformations of the environment. The process of urbanization underwent several phases, including one during the early Middle Ages (fifth-tenth centuries). This was the in period in which the “new cities” appeared, a concept which was borrowed from geographers and town planners of the 1960s. These new cities were river towns, and they all share some common features. Geographically they are located in an area which covers northwestern Europe; topographically they took shape on the banks or in the estuaries of the great European rivers.7

These features led some historians and archaeologists to recognize in them the influence and the contribution of the Scandinavians or the Frisians.8 It is true that these societies of sailor-merchants experienced a great expansion in the same period and in the same area; deep down, this is pretty close to Pirenne’s theory, albeit with an ethnic twist. Historians and archaeologists also relied on the theories of town planners and urban architects who believed that the urban can only arise from planning by one or more authorities. Grounded in studies of urban morphology, this theory recognized the existence of urban structures in the ancient world but then passed obliviously over a thousand years of urban history to discover the “reappearance” of the urban fact only in the early modern period. The Middle Ages did not come up to this standard.

Early medieval urban establishments share a certain number of common characteristics which have emerged from archaeological explorations and which, rather like mathematical estimators, constitute indicators of the urban fact.

1. The urban fact of archaeologists and of environmental archaeology

1.1. Archaeological indicators or criteria

Archaeologists are a kind of “sedimentary historian,” who work on material but mute sources. In order to understand the process of town formation, they have defined a number of parameters which enable them to characterize what constitutes an “urban fact” in the early Middle Ages. The first criterion is spatial: the surface area occupied during

6 Burnouf 2003.
7 Lebecq 1983.
the first half of the medieval millennium must be defined and compared to the urban surface areas of the periods which immediately preceded and followed. The second criterion is the presence of that special sort of sediment called “black earth”. Admittedly this descriptive term can cover quite different realities. Black earth is nevertheless present on all town sites of the early Middle Ages. The depth and physical and chemical features of the sediment vary, but the occurrence of the black earth itself remains a constant. This fine, dark-colored layering within which the stratification is as hard to read as it is to interpret, nevertheless represents some six hundred years of archaeological archive of the history of early medieval towns. It must be studied not only as a highly specific material vestige across its entire sedimentary depth, but also spatially: where and over how much surface do these black earths occur? Beyond particular taphonomic conditions, analysis of this composite material shows high frequencies of organic materials, of hydromorphy (the chemical transformation of materials through the seepage of water), and consequently particular treatment of materials used by these societies as well as their management of trash within a circumscribed space. The third criterion for studying the urban fact is that of the boundaries of occupied spaces reflecting the activities of the social groups which produced the urban fact, and the density of occupation per spatial unit. The fourth criterion is the characterization of the structure and the morphology of the basic unit of spatial organization, whether it be a plot or a house. The fifth criterion observes the traffic network, its structure, organization and density, compared to the occupied space. The entire set of these criteria which constitute so many indicators must then be ranked in terms of the reliability of the data, and treated statistically. The same should apply to the archaeological finds, whether they represent artifacts or ecofacts. What really changed the interpretation of the data was correlating the archaeological data in the narrow sense with the environmental data. In the case of the formation of towns, the most important of the latter turned out to be the environmental features of valleys, and the proximity of rivers.

1.2. New approaches: Environmental archaeology and understanding the state of the ecological milieu

Questions which can be applied to the study of the connections between urban societies and water systems include: What type of correlation exists between an urban system and a river system? What was the state of the river system before the urban development of the early Middle Ages, and what did the broader space, and the landscape look like? In terms of the early Middle Ages, we need to know the state of the river system
around the first century of our era. Next we need to investigate the interaction between communities and rivers over the last 2,000 years: how, for instance, rivers reacted to human intervention (e.g. hydraulic modifications, embankments, construction in the river bed, etc.) and how feedback effects and river dynamics affected the settlements.

The example of the studies conducted in the Loire valley will illustrate how environmental archaeology changed the interpretation of the available data, and the study of the process of urbanization. To answer these questions it is necessary not only to understand the functioning of fluvial systems but also the past rhythms of their normal and exceptional dynamics. This requires an interdisciplinary dialogue between archaeology and the natural sciences.

The formation of alluvial plains is an old process which followed the last glaciation, starting with the most recent glacial retreat. But on a human time scale, at the micro-local level, the basic land forms stem from the early Holocene (between 15,000 and 5,000 BP): an ancient network of interwoven courses, former channels or river beds, or river bank buffer swells (Fig. 1). They include irregularities which could be reactivated in unusual periods of more or less extreme conditions and, on a broader scale, in periods of deteriorating hydraulic conditions. We know, for instance, that old river channels which, according to radiocarbon dating, were blocked by about 3,500 BP, remained wetlands and came back to life when the river flooded.\footnote{Dubant 1993; Vivent 1998.} They therefore continued to

Fig. 1. Geomorphological cross section of the Loire valley
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Fig. 2. Map of the triple valley of the Cher, Indre and Loire rivers, showing fluvial morphology, confluences and “turcies” (levees)

represent serious obstacles for early medieval societies. Moreover, as the examples of Lyons and Tours show, interfluves, that is, areas lying between rivers, and the areas at river confluences, offered particularly unstable spaces whose complex history is a stratigraphical tangle.

Rescue archaeological projects undertaken at Lyons since 1984 illustrate nicely how environmental archaeology has completely altered our understanding of an agglomeration’s historical development. Before the mid-1980s, investigations focused on the urban features of the city, whose essence, it was maintained, was inherited from classical Lugdunum, at the confluence of the Rhône and the Saône. The first breakthrough was the demonstration of fluctuation in the area of the confluence itself, and the persistence until the central Middle Ages of branches of the Rhône in the modern “peninsula,” Presqu’île, the confluence zone.12 Two important conclusions followed from these observations. Until the second Iron age, this area was not suitable for human occupation because of the river’s hydraulic regime and the high risk character of the location. Rather, contemporary human occupation should be sought upstream from this zone, on the right bank of the Saône in the “plain” of Vaise, paired with two sites on high ground, on the hills of Fourvière and of Croix Rousse.13 Starting with the classical period, urban infrastructure projects changed the occupation conditions in the valley and in the interfluve, in connection with a climatic optimum which lasted until the end

12 Bravard/Prestreau 1997.
of the first century of the common era. Thereafter, settled areas can be documented archaeologically on both the right and left banks of the Saône, close to the confluence, which then lay further to the north and to the west, within the flood plain. Sites with the potential for urban development only began to be exploited on the Saône’s right bank from the fourth century, with the appearance of the cathedral district, that of the canons, as well as the ports. Taken all together, the publication of these findings established a point of departure and of comparison for investigating the Loire valley beginning in 1995, and for reconceptualizing the problems of environmental archaeology.

2. Cities and wetlands before the tenth century: urban development occurred in interaction with the river and opportunistic water management

2.1. Legacies

A first, essential idea is that any given society must deal with systems that it inherits in a certain state. In the middle Loire region, between Nevers and Angers, the Loire’s floodplain spreads out into “valleys,” formations that were defined by Roger Dion. As wetlands rich in biodiversity, these areas offer a certain number of potential advantages for human societies. In the valley of Tours, rescue archaeology has just begun to document the situation inherited from recent protohistorical times, and human society has left clear tracks in this wetland zone which was crossed by the ancient courses of the Loire and the Cher. This space is a broad interfluve and, in that period, the Cher had four different confluences with the Loire: from east to west, they were the brook of Saint Anne, the spit of the Cher, the Rupuanne, and the Avoine (Fig. 2). The ancient town, built at the beginning of the first millennium of our era, occupied about 70 hectares on the left bank of the river. Communities settled on the swell at the river’s edge, in direct contact with the water, as well as on the old river channels which had filled in since the Neolithic era. The old river channels were always low-lying and could flood in periods of high water; such a site is known as a “boire”. Ancient societies capitalized on the hydromorphism of these areas. The present state of archaeological research locates classical settlement to the east of the recent protohistorical occupation; it does not exactly overlap with the latter, although new discoveries could show otherwise. In

17 Arlaud/Burnouf 1994; Arlaud/Bravard/Franc/Verot-Bourrely 1997; Burnouf 1990.
18 Dion 1934.
19 De Filippo 2004.
other words, even though one can observe permanent occupation on the left bank of the Loire, on the microlevel there was a certain discontinuity in the exact location of that occupation.

This explains why, until now, archaeologists had believed that the site was not settled prior to the classical town. This interpretation was grounded in two erroneous assumptions: on one hand, wetlands were assumed to be unsuited for human habitation, an idea that gained currency in the eighteenth and especially in the nineteenth centuries thanks to the school of the “hygienists,” and which was still current in the late twentieth century. On the other hand, *oppida* sites, which are located on heights, were over-interpreted. They were assumed to be the norm for inhabited places, because “open” agglomerations of the same period had not yet been discovered in the valleys. In other words, a provisional state of knowledge was mistaken for a real state of the past.

At the end of antiquity, Tours’ occupied space seems smaller. The archaeologists reckon it at about nine hectares and, from the fifth to the twelfth centuries, occupation polarized around two centers on the left bank: to the east, the elite ecclesiastical and lay district centered on the cathedral and, to the west, the district around the abbey of St Martin.20 The early medieval inhabitants recycled, in part, ancient urban structures even as they adopted a different spatial distribution and urban focuses. In fact recent discoveries21 show how those focuses had changed even before that, for instance, by the slight (on a macro-scale) shift of the ancient settlement to the east, compared to the open, protohistorical agglomeration. For the ancient city itself, the discovery of an impressive bath complex, built on a “boire” or old river channel susceptible to flooding, revised our understanding of the classical town’s central focus, by shifting to the southeast where we now recognize the “center” of the ancient agglomeration. Out of this inheritance, early medieval communities constructed a different use of the inter-fluve and the wetlands.

2.2. The river as a polarizing force:
the attractive power of various forms of riverine space

Starting with what was already in place, that is the inherited state of the river and related structures, as well as with the ancient urban fact, human groups kept on exploiting the swell at the river’s edge as well as the accumulated rise created artificially by the ancient occupants (5 m in the eastern area, and 6 m in the west).22

20 Galinié 1986.
21 Fouillet 2004a; *idem* 2004b; De Filippo 2004.
However, as the excavations show, they also gained ground on the left bank of the Loire over the next 500 years, particularly between the abbey of St Martin and the Loire. They also occupied certain parts of the wetlands south of the abbey, even including “boires” that crossed between the palaeochannels, the former courses of the Loire and the modern river. The different elements which make up the interfluve, that is, the Loire itself, its affluent the Cher, and the palaeochannels which had become “boires” were integrated into social experience as spatial and topographical points of reference. They show up in the written sources as early as the tenth century, and occur as legal and political boundaries in the eleventh. In addition, people took over the banks and the shores, as well as the islands within the river bed.

Their concern, insofar as we can interpret it, was thus to adapt to the microtopography of the river courses, and to the forms of the river bed, even as they sought to control the changing water levels of the two hydrosystems and exploit the biodiversity of their ecologies.

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24 Ibid., chapter 8, 10; idem 2005.
Although the same principles obtain in the case of the interfluve of the Loire and Cher as in the studies conducted in the Rhône valley, the topography and the operation of the hydrosystems differ. This helps us to see how human populations solved their problems in different ways. At the macrolevel, the ancient agglomeration of Tours is situated on the Loire’s left bank, on the swell at the edge of the river and in direct contact with it, in a floodplain irrigated by the flood channels of the two rivers. The city was built in the northern part of the interfluve, in the Loire’s floodplain, opposite two important depressions on the right bank: the valley of the Cisse to the east, and the valley of the Choisille to the west. These two depressions connect the right bank of the Loire valley with the region of Blois to the east, and the valley of the Loir to the west. This situation affords an opportunistic exploitation of lateral communications with the northern plateau via these two valleys, and resulted in the development of communications axes – bridges – as well as other activities – mills – directly connected to the town. Upstream of the agglomerations, on the right bank, in addition to the abbey of Marmoutier, two other nuclei related to river traffic developed near the confluence of the Loire and the Cisse. In this case, people also made good use of the river’s energy for navigation as well as its changing river levels and currents: the siting of the city’s ports owed nothing to chance, and everything to the Loire’s currents and hydraulic regime. Certain social groups, heirs of earlier economic, administrative and legal structures, required for their activities a certain number of goods of local, regional or more distant origin. In broad terms, whether they simply managed or acquired them, these goods were transported by river to centers of consumption and distribution. In order to optimize the offloading of cargo, the ports on both sides of the river were located at the points at which the current flowed into the shore. This insured that even in low water periods the river remained deep enough for boats to dock there, precisely where the social players of the early medieval city took ownership for their ports. This port activity gave rise to two boroughs. The location of occupation at the river’s edge thus shows a relation of close interaction with the river. Sometimes human activity can be detected archaeologically in perennial fashion: bridges were built, places of power which can still be seen were raised, the banks were built up. On the other hand, the state of the environment, the exact line of the banks, the patterns of water movement are all more difficult to “read” on a macro-scale, and to interpret from the deposits.

This suggests that how an environment works and its state at a given point in time create or impede possible uses of that environment by societies in spaces which may be termed “potentially suited to urban development.” One observes therefore that on a time scale which is short for the workings of the river, but long for those of human societies, the exploitation of the river, its banks, the main river bed and the floodplain were so

many “spatial potentials” implemented by those societies. That was certainly the case between the fifth and the eleventh centuries. The attractive power of this particular space encouraged human groups to take control of it even without a clearly defined prior intention, a program, without the directive intervention of some “power.” So far as we can judge from, or at least interpret, the archaeological and written evidence, it would seem rather that such powers profited from the new conditions created by social groups, in order to benefit from a development which they did not start.

This is what happened with the development and improvement of the river in the early Middle Ages. The state of affairs observed in the tenth century is therefore quite different, and one can interpret it as a new spatial organization. This interpretation inventories a situation which one can consider as the unpredictable outcome of the choices made by human groups in the various earlier periods, that is, during the early Middle Ages.

If we were to shift our vantage point from the scale of the Tours interfluve to that of the middle Loire valley, we could observe a series of comparable phenomena: uninterrupted occupation without continuity, unpredictable outcomes in the absence of an initial urban project, direct contact with the river against a backdrop of the exploitation of the microtopography of “boires” and wetlands. The archaeological data allows us to make the same three observations about different agglomerations in the middle Loire: Orleans, Meung-sur-Loire, Beaugency, Blois, Amboise, Candes-Saint-Martin, etc.

These developments put in place by human societies across the five hundred years from the fifth to the tenth centuries were joined at the end of the early Middle Ages by an innovation: the construction in the river bed of levees, which introduced powerful constraints into the hydrosystem. It happens that that five-hundred year period witnessed at least two hydrological deteriorations which are documented across the whole of northwestern Europe: one in the sixth century, and another at the beginning of the ninth century.28

What archaeologists observe is the manner in which communities occupied and transformed the banks of rivers during the first medieval half-millennium, and how they created not only their lodgings but also the structures necessary for their activities. They observe how people exploited the hydraulic energy produced by the river. But they also detect how people developed the botanical and animal resources of the river environment by installing “in” the river bed the structures required by these activities. Communities took control not just of the banks, but of the river itself. Once these different activities coalesced, they produced new spaces, new “places” of population density which were mutually dependent and which relied on the river. In so doing, these groups also created new constraints, not only for themselves, but also for the hydrosystem with which they constantly interacted. These constraints took shape as the development of new “molds” which patterned space: constructions for crossing, for

28 Burnouf 2002.
fishing or navigating, for directly exploiting the latent energy of the river, and especially, construction to protect some of the spaces: the levees. In the light of the evidence, it seems to me that the social groups which occupied these spaces, spurred precisely by the growth of the coalescing population, developed new agricultural activities on the interfluvial soils. Such activities ran counter to the river’s hydrological workings in the form of floods. In order to protect these new activities from the river’s risks, from an uncertain date social groups began to construct the levees which are first mentioned in 821 (as Latin *aggeres*), and from the tenth century were called “turcies” (Figs 3-5). This “fettering” of the river isolated four different spaces, three of which came to be called “islands”: the agglomeration of Tours, the island of Berthenay, and the island of Rupuanne. By cutting these territories off from the two rivers, these new enterprises
impacted the spatial whole at the local scale, insofar as they deprived the rivers of their floodplains and increased the pressure of floods on these spaces during periods of high water at the regional scale.

So social groups “use” a certain state of an environment which also happens to come to them from the past but does so at another scale of time and space from the social. It is the interaction of these two different scales of the two different systems, the social and the river systems, which leads to a new state of the systems.29

Scholars have observed a result, a state of affairs in the eleventh century which resulted from a long process. All along the river’s floodplain, between Nevers and Nantes, the written as well as the archaeological evidence attests to the existence of 29 larger or smaller agglomerations, situated around every 24 km. This state of affairs, which still obtains today, is a legacy of the process of the construction of the urban fact between the fifth and tenth centuries (Fig. 6).

The early Middle Ages: a profound cultural change in the relationship between social groups and the environment in the valleys

Indisputably, the half-millennium of the early Middle Ages marks a turning point in the way social groups related to the valley environment. While archaeology in the more conventional sense allows us only to observe and interpret certain results, environmental archaeology permits us to ask our questions in a different way, and so to interpret anew the archaeological traces of the initiatives of social groups. The urban network observable in the eleventh century is a state of affairs inherited from 500 years worth of social systems. This network made the Loire’s floodplain into an “urban ribbon” which

29 Burnouf 2005.
remains active to this day, and it was laid down by the societies of the early Middle Ages. It represents a profound cultural transformation in the relations early medieval societies developed with moving water and its hydraulic power. It also represents the desire of the social groups operating in this space for permanent interaction with the rivers. The material outcome is the urban fact: these are truly river towns, and the urban fact attests to that profound cultural transformation.

In order to meet needs that arose from their food supply as well as their other activities, the very same social groups who were creating the urban fact undertook projects whose result was to constrict the workings of the river and its “breathing space”, particularly in high risk periods, in floods. As we know, the sixth and the early ninth centuries were two moments of deteriorating water and climatic conditions. Perhaps in that connection, those social groups launched even more constrictive projects by beginning to build levees. That undertaking, which would continue until the nineteenth century, triggered chain reactions both in the environment and for societies (Fig. 7). It started a process which creates risk for successor societies, and demarcates an irreversible turning point in the diverse situations of the floodplain of the middle Loire.

(translation: Michael McCormick)

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