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LANDSCAPE ARCHAEOLOGY AND GEOGRAPHY:

between observation, transfers and co-constructions

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LANDSCAPE ARCHAEOLOGY AND GEOGRAPHY:

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Sandrine ROBERT

Abstract

Since the end of the 19th century, relationships between landscape archaeology and geography appear to have been determined as much by the concept of time as by that of space. We can distinguish an initial period when geography and historical sciences were linked by a cyclical perception of the dynamic of landforms. From the 1960s, theoretical complementarities became more difficult because the explanatory model changed in geography, towards a view of a present which was no longer dynamically linked to the past. Since the 1990s, the theory of self-organisation and the concept of resilience, by introducing time as an agent in its own right within organisations, have made theoretical co-constructions possible once again.

Keywords

Archaeogeography, landscape, resilience, temporalities.

Introduction

As early as 1921, Jean Brunhes and Camille Vallaux, in *Géographie de l'Histoire*, and Osbert Guy Stanhope Crawford, in *The Man and his Past*, attempted to clarify the relationship between geography and archaeology (Brunhes, Vallaux, 1921; Crawford, 1921). Giving a full overview of this interaction is beyond the scope of this paper. I aim to examine it in relation to the theme of landscape and agrarian structures, which was an important melting pot for these exchanges (for another point of view, see for example: Gentelle, 1995).

1 - Complementarity and interdependence in cyclical time

In 1921, Jean Brunhes and Camille Vallaux, in defining the relationship between geography and other social sciences, wrote: "history, archaeology, prehistory, anthropology, ethnology, economic and statistical sciences [...] all understand and affirm that the isolated event can be subject to such contradictory interpretations that it must not be studied in isolation; it is necessary to situate it in the context of the life which created it; it is a link in a chain..." (Brunhes, Vallaux, 1921: 21).

To understand this concept, we must examine it in relation to the theory of landform change adopted by geographers at the end of the 19th century. This theory favours a cyclical view, inspired by the life sciences, which is expressed in the idea of an erosion cycle, or of "*ages of topographic forms*" (Brunhes, 1925: 11, italics in original). According to this theory, defined by William M. Davis (1850-1934) and brought into France by Henri Baulig, landforms fit into progressive series which follow an irreversible sequence, ending in a final, denuded state of the original feature

(Coque, 1996: 367). This notion of a cycle was transferred to human geographical features and Jean Brunhes, for example, suggests "searching, first and foremost, for the cause responsible for the birth of these phenomena, and for whether their current state indicates maturity or degradation" (Brunhes, 1925: 13). Archaeology, like history, is therefore called upon to provide chronological elements capable of defining a phenomenon's origin or its stage of development. This organisation of knowledge was formalised in Roger Dion's project of retrospective geography. While historians and archaeologists situate their viewpoint in the past in attempting to provide a full picture of earlier periods, geographers sort through historical events and only keep those which have left traces in the present, or which can explain it (Dion, 1949; 1957; Flatrès, 1994). The past is mobilised in order to establish a "genealogy of what has remained through transformation" (Verdier, 2009: 13).

For Brunhes and Vallaux, the interaction between archaeology and geography occurred in particular in relation to cartography. During the early 20th century, this became vital for geographers, as a way of generalising observations by correcting the limitations of a local viewpoint, and as a means of explanation (Clozier, 1942: 111-112). With this in mind, Brunhes and Vallaux encouraged archaeologists to use it in order to define "true periods" such as the Neolithic, and not "simple local constructs" (Brunhes, Vallaux, 1921: 30-31).

We find the same position in the work of O.G.S. Crawford, for whom cartography was necessary in order to define "*the extent in space of a given culture during a given period*" (Crawford, 1921: 79, italics in the original). However, he states that it is necessary to go further when placing archaeological sites in their geographical context. Taking the example of Sussex, he proposes maps which link the distribution of "Celto-Roman" and "Anglo-Saxon" settlements with slope, water, and the remains of field systems on the upper slopes of the plateaux (Crawford, Keiller, 1928: 8-9, figs. 1-2). He thus applied the geographers' explanatory model founded on notions of "combination" (Vidal de la Blache, 1913) or "connection" (Brunhes, 1925: 36). Cartography simultaneously carries out a generalisation and an explanation by comparing different elements. This idea of combination is expressed in particular through the notion of "landscape", which establishes links between human morphological features and natural features (Dion, 1934). Geography does not simply give a list of localised events or enable the generalisation of a local observation; it contributes a scientific explanation by organising landforms into groups whose components affect each other as part of a whole. Landscape thus constitutes a "synthesis" prior to analysis (Meynier, 1970).

During this initial period, the study of agrarian structures became an important space for exchanges between geographers and archaeologists with shared themes and, in particular, a shared method: morphological analysis. Created by the natural sciences, this enabled geographers and archaeologists in the second half of the 19th century to establish their own systems of classification. Observation (in the field) and explanation of material remains were of great importance to both disciplines. The latter must enable us to "perceive the social event which is contained within it" (Brunhes, Vallaux, 1921: 42). Morphology, by placing geography and archaeology alongside the observational sciences, allows them to take a step back from history, their mother-discipline, where the study of documents dominates.

After World War I, archaeologists and geographers developed the conditions of use for a new source of information: aerial photography. This was used as the basis for morphological analyses of landscapes, in geography and archaeology. It seems significant that one of the two key manuals in this field in the 1960s and 1970s was written by a geomorphologist, Jean Tricart, while the other was by Raymond Chevallier, a historian with an interest in archaeology and who played an important role in the morphological analysis of land divisions (Tricart *et al.*, 1970;

Chevallier, 1971).[1] Aerial photographs enabled the landscape to be analysed "in a global way" (Chevallier, 1976: 507) and photo interpretation fostered collaboration between the two disciplines (Snacken, 1964: 232). During this initial period, syntheses typically came from the geography side, which produced the theory of change and the explanatory model by means of the concept of landscape. This placed archaeology in a supporting role whereby it provided daymarks which determined one's position in the cycle of time: "The sciences which support history and geography provide important information [...] Archaeology dates objects discovered in the banks and the fields." (Meynier, 1970: 9-10). Nevertheless, it appears that geography was also somewhat dependent on the sciences of the past, because in the cyclical perception of time, the present is linked to the past by a shared dynamic. Understanding the past was therefore necessary to explain the present.

2 - A phase of mutual observation

In the second phase, which began in the 1960s, geography's explanatory model shifted from human-environment relationships towards social and economic relationships. Functions and flux were overemphasised, at the expense of form. Geography sought to highlight processes and laws, using the deductive method. For certain geographers, traditional cartography was seen as a "static language", no longer relevant as a tool for synthesis, as it prioritised the "visible in the landscape", at the expense of the invisible aspects of space: decision processes, spread of information, etc. (Dauphiné, 1998: 57). Morphological analysis was gradually replaced by mathematical models and explanatory diagrams.

However, at the same time as many geographers were abandoning landscape as an explanatory model, archaeologists were adopting it in order to develop *Landscape archaeology* (Aston, Rowley, 1974). In 1977, Raymond Chevallier organised the first French conference on the "*Archéologie du paysage*" (landscape archaeology), which he saw as fitting into two research traditions: that of the geographers, from the time of Vidal de la Blache, up to Georges Bertrand, and that of historians such as Marc Bloch or Emilio Sereni (Chevallier, 1976: 507). Maurice Le Lannou gave the conference's inaugural address and Georges Bertrand presented a paper where he proposed viewing landscape archaeology from the perspective of historical ecology (Chevallier, 1978).

From the 1970s onwards, archaeologists continued to develop the methods and tools of morphological analysis, which had been somewhat abandoned by geographers. The "seminar on photo interpretation and historical topography", created by Raymond Chevallier at the *École pratique des hautes études* (EPHE) in 1963, was attended by archaeologists, cartographers and urban planners and his photo interpretation textbook was aimed at a much wider public than simply the historical community (Chevallier, 1971). With the help of engineers, historians and archaeologists developed increasingly sophisticated tools for analysing landscapes, such as the optical filtering method (Chouquer, Favory, 1981), frequency and direction analysis (Charraut, Favory, 1995) or pattern recognition (Robert *et al.*, 2013). However, beginning in the 1970-1980s, ties weakened between geographers and archaeologists regarding morphological analysis and photo interpretation, in the face of criticisms of morphological analysis[2] and the use of satellite imagery, which was difficult for archaeologists to access. Alongside this, agrarian and landscape archaeology were slow

1. Fernand Joly compared the two in a 1972 review (Joly, 1972).
2. For Gérard Chouquer, this rejection of morphological analysis of landscape demonstrated that archaeology possessed "a resolutely geographical genealogy, but with no possible link to the discipline." (Chouquer, 2011: § 29).

to apply systems theory, despite the calls of Georges Bertrand who, as early as 1975, invited historians and archaeologists to use it (Bertrand, Bertrand, 1975; Bertrand, 1978; 1991). He saw in it the potential to establish an agrarian archaeology and a landscape archaeology which would be more "than a conglomerate of different research projects [...] without communication between them and without an overall objective" (Bertrand, 1991: 16). The new geography favoured a time of flux and functions (Bailly, 1998). The present was no longer explained by the origin of a process which began in the past, but by economic and social relationships which were constantly being updated. Past and present were no longer questioned in the context of a dynamic relationship because geographers no longer needed the past to explain the present. In *L'Ère des techniques*, for example, Pierre Georges describes the surviving strata in the landscape as "scenery from times gone by", frozen in "the resistance of small out-of-date economies and aged populations, who missed the train of modernisation" (Georges, 1974: 22).

Despite this, exchanges between the two disciplines multiplied from the early 1970s onwards, in relation to spatial analysis and urban analysis (without listing them all, see in particular the studies cited in Djindjian, 1991). They focused in particular on the use of methods of spatial analysis (site catchment analysis, central place theory, gravity models etc.) and, starting in the 1990s, on the development of new tools such as geographical information systems (Rodier, 2011). Fundamentally, however, relations between archaeology and geography remained centred around the observation of a sequence of states, rather than the understanding of real dynamics. In the fields of agrarian and landscape archaeology, geographers appear to have been in a position of observation rather than true collaboration: they were invited to write prefaces to books (Le Lannou, 1978; Bertrand, Bertrand, 1975; Bertrand, 1991), but we find few shared theoretical or methodological constructions.

3 - Co-constructions in non-linear temporalities

The period from the 1990s onwards became more conducive to co-constructions, in particular thanks to a more widespread adoption of systems analysis by the archaeological community. In 1997, Gérard Chouquer named Volume 3 of the series "*Les formes du paysage*" ("The forms of landscape"): "*L'analyse des systèmes spatiaux*" ("Analysis of spatial systems"). Here, he suggests replacing the discipline's traditional pattern with a systems approach based on the relationships between ecosystems, social systems and morphological systems. He makes specific reference to the works of geographers such as Claude and Georges Bertrand, Roger Brunet, Philippe Pinchemel, etc. (Chouquer, 1997).[3]

Systems theory was at the heart of the Archaeomedes project, a European research programme (1992-1999) which was instrumental in bringing together geographers and archaeologists. This project aimed to highlight the anthropogenic and natural dynamics involved in the deterioration of the Mediterranean environment, and particularly in desertification (van der Leeuw, 1998). In France, this took the form of research focused on the resilience of a system of towns which contributed to the integration of the theory of self-organisation and resilience in archaeology and geography (Durand-Dastès *et al.*, 1998). By demonstrating that the population structure of the South of France was already in place during the Roman period and that the mutations of the modern and contemporary periods had merely adapted the Roman and medieval heritage,

3. In archaeology, systems theory was particularly active in the field of fluvial ecosystems where we also find concrete examples of theoretical co-constructions which brought together geographers and archaeologists.

researchers proposed drawing their explanatory model from that of self-organisation. In this concept, the form of organisation stems more from interactions between the elements which make up the system, than from an order imposed by an external force, and time becomes one of the agents in the structuring of these organisations (Durand-Dastès *et al.*, 1998: 17).

In order to understand how the overall structure of the network of towns survived, through constant reorganisations of their environment, researchers suggested using the concept of resilience which implies "an ability to adapt to external changes, but also to the production or adoption of technical and cultural innovations..." (Durand-Dastès *et al.*, 1998: 13-14). In her thesis, produced as part of the Archaeomedes project, Cristina Aschan-Leygonie proposed that the concept of resilience be applied to geography, using the definition given by the ecologist Crawford S. Holling, who defined resilience as a system's ability to absorb and even use disturbances and changes which affect it, without a qualitative change taking place in its structure (Aschan-Leygonie, 1998; 2000; van der Leeuw, Aschan-Leygonie, 2000). After a disturbance, the system does not return to its previous equilibrium, but rather it reacts in a creative manner, through multiple changes and readjustments (Aschan-Leygonie, 2000: 65). In this theory, changes and disturbances appear to be inevitable and even necessary for the dynamic and preservation of the system.

These propositions arrived in archaeogeography at the same time as researchers began to compare planimetric data with fieldwork data on a large scale, in the context of rescue archaeology. Increasing numbers of incoherencies were found between the supposed dates of landforms according to "morpho-historical" and synchronic models, and those obtained in the field (Robert, 2003a). Certain patterns of land divisions, road networks etc. appear to develop, beyond the cultural and political contexts which introduced them, in non-linear chronologies, marked by phenomena of hiatus and renewal. They are reappropriated by societies which treat them differently (Marchand, 2003). It is not therefore inertia which passes down a system through time, but transformation at smaller scales which helps to maintain a macro-structure (Robert, 2003b). In 2003, I used the work of Cristina Aschan-Leygonie to put forward a model for structuring spatio-temporal scales which explained the resilience of regional routeways, from the Roman period to the present-day, through constant transformations which took place at micro- (modelled) and meso- (pattern) scales (Robert, 2003c).

Resilience theory, which became widespread in geography during the second half of the 2000s through the geography of risk, is today the subject of numerous debates and the study of systems in the *longue durée* appears to be one of the means of overcoming the current limitations of the theory (Reghezza-Zitt *et al.*, 2012; Djament-Tran, 2015). In 2003, the archaeologist Charles L. Redman and the ecologist Ann. P. Kinzig dedicated an article approximately thirty pages in length to archaeology's contribution to resilience theory (Redman, Kinzig, 2003).[4] More recently, Ann P. Kinzig has shown that the definition of resilience would greatly benefit by integrating the research on "cultural landscapes" carried out by the social sciences, as this demonstrates the complex relationship which exists between humans and nature (Kinzig, 2012). The geographer Géraldine Djament-Tran suggests we "historicise resilience" in order to understand more fully the various time scales and endorses a transfer and a dialogue with the work of historians and geohistorians who typically do not use the term 'resilience' but who explore the continuity of urban trajectories through notions of urban permanence or spatial reproduction (Djament-Tran, 2015: 75-76).

4. More widely, on the central role that archaeology could play in research on the environment: van der Leeuw, Redman, 2002.

One possible contribution of history and archaeology can be observed in relation to the definition of the role of inherited structures in current systems (Aschan-Leygonie, 2000: 75). The historical sciences also favour the study of the effects of past disturbances as they enable us to observe them in the *longue durée* (in the domain of land use, for example: Redman, Kinzig, 2003). Contributions also seem possible regarding the theorisation of the model of change known as "panarchic", which has been put forward by theoreticians of resilience (Gunderson, Crawford, 2002). In this model, researchers struggle to agree on what should be considered a major change, otherwise known as a bifurcation (Reghezza-Zitt, 2012). Archaeology can enable the observation of full cycles and the identification of real and deep transformations, as well as the evaluation of their geographic expansion (Redman, Kinzig, 2003). The part played by archaeology and the historical sciences more broadly appears fundamental for gaining a greater understanding of the structuring of spatio-temporal scales in the resilience of socio-spatial systems. Landscape analysis in the *longue durée* and archaeogeography are particularly well-placed to participate in this debate (Kinzig, 2012). Within interdisciplinary networks, working groups enable resilience theory to be honed.[5] By giving a space to the *longue durée* in the dynamic of systems, it reintroduces a heuristic bridge between geography and archaeology.

Conclusion

Today, conditions appear to be favourable to conceptual exchanges and co-constructions between archaeologists and geographers. Time has been reintroduced as an agent in its own right in the comprehension and construction of the resilience of systems. Contrary to the framework which linked archaeology and geography in cyclical time, the present is not tied to the past by a predetermined process. It appears instead as a remobilisation of possibilities opened by the past, as demonstrated, for example, by the use of the notion of uchronia in archaeogeography (Chouquer, 2007: 266-267). More broadly, archaeologists and geographers also share a methodology, through systems analysis and common tools such as geographical information systems (GIS) which bring together different traditions by simultaneously linking their descriptive, modelling and quantitative dimensions. Through the formalisation of data, they make these elements interoperable between the two groups and facilitate exchanges between disciplines.

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5. See for example the work of the Resilience Alliance (https://www.resalliance.org) or the research project REAL: Resilience in East African Landscapes (http://www.real-project.eu), which are collaborations between archaeologists, anthropologists, ecologists, geographers and historians. In France, resilience is explored in the spatio-temporal lexicon currently being written by the group "*Systèmes du peuplement sur le temps long*", which involves geographers and archaeologists in the *Laboratoire d'Excellence* "*Dynamiques Territoriales et Spatiale*" (LabEx DynamiTe).

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