Migration or landscape fragmentation in Early Medieval eastern France? A case study from Niedernai

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ABSTRACT

Modelling of archaeological remains in the landscape is a common tool in multidisciplinary research projects that focus on the movement of material and people. The interactions of human, material, and environmental spheres, however, depend on the scale, permeability and availability of the environment. This article deals with the construction and range of activity spheres in Early Medieval eastern France. A transformation period necropolis at Niedernai that dates to the 5th and early 6th century shows long-term settlement continuity with regional communication networks and local land-use strategies among other locally scattered communities. The consistently populated site-catchment in the Upper Rhine Valley was chosen to estimate the theory of large migration processes in the 5th century. Spatial analyses of GIS-based environmental and remotely sensed geomorphological data derived from satellite imagery were conducted. Social structure and social organisation changed at the transition from the Imperial Period to the Early Medieval Ages, affecting land use strategies and economic developments. Larger infrastructural networks were replaced by small-scale dwelling assemblages indicating local spheres of influence in a rather fragmented landscape.

1. Introduction

Human-environmental networks are based not only on physical but also mental concepts of the surrounding landscape on different spatio-temporal levels (Butzer, 1982; Brather, 2017). Landscapes not only provide resources but also include a system of layered cultural, social, religious and cultic meanings (Brather, 2011; Zimmermann et al., 2005; Fleming, 2006; Bintliff, 2008; Lüning, 1997; Meier, 2009, 2017; Doneus, 2013; Ermischer, 2004). Cognitive maps (Ingold, 2000; Butzer, 1982) reflect socio-cultural as well as pragmatic and economic interests (Gramsch, 1996), that result in modified land-use methods and local human-environmental interaction. In Early Medieval archaeology, however, fluent transformation of landscape concepts due to changes in physical conditions, technical enhancements and administrative circumstances in the late 5th and early 6th century AD are traditionally linked to large-scale migration processes after the so-called 'Fall of Rome' (e.g. Von Rummel, 2013; Fehr, 2010). Depending on the scale, permeability and availability of the environment, 'barbarian invasions' can rather be replaced by intra-site mobility, fragmentation and social remodelling of small groups displaying various identities in a joint environment (e.g. Halsall, 1999). In this case, the study site represents a part of the periphery of the former Roman Empire that has been selected to conduct GIS-based spatial analysis of the Early Medieval archaeological record, the surrounding geological and pedological units, as well as the modern landcover deriving from satellite imagery. Within the broad research area of the Upper Rhine Valley, a 5th and 6th century graveyard with 31 graves and 32 human individuals at Niedernai, France (Brather-Walter, 2015) permitted the assessment of land-use strategies of a small and continuous population at the transition to the Merovingian Period. The interconnections between graveyards and settlements were evaluated in terms of distance analysis to further estimate a possible modern bias caused by present-day residential coverage.

2. Material and methods

2.1. Regional settings

The research area in the Upper Rhine valley belongs to an agriculturally intense used region with mild winters, early springs and warm autumns favoring an early phenological phase and long vegetation periods (Stork and Menzel, 2016). The valley represents a regional section of the northern hemisphere frontal zone at the transition from subtropical warm to subpolar cold air masses (Häckel, 2016; Parlow et al., 2006). The location of the orographic barrier almost perpendicular to the prevailing western air flow affects the spatial and temporal

Table 1

Archaeological site-catchment of the Niedernai necropolis '*Kirchbuehl*'. Three classes were created [Roman settlement record, Early Medieval Period settlement 'noise'/single finds and Early Medieval burials] from various databases exported from the platform ArkeoGIS [www.arkeogis.org].

Chronology	Database	Main location	2nd location	Projection	Lon.	Lat.	State	Id.
Roman	Patriarche_67	1 Obernai		4326	7.4783306	48.445446	Survey	Settlement
	Patriarche_67	2 Obernai		4326	7.4783306	48.445446	Survey	Settlement
	Patriarche_67	3 Obernai		4326	7.491906	48.44834	Undetermined	Settlement
	Patriarche_67	4 Obernai		4326	7.491906	48.44834	Undetermined	Settlement
	Patriarche_67	5 Obernai		4326	7.5125837	48.46604	Survey	Settlement
	Patriarche_67	6 Obernai		4326	7.502398	48.478687	Undetermined	Settlement
	Patriarche_67	7 Obernai		4326	7.516338	48.476067	Undetermined	Settlement
	Patriarche_67	8 Obernai		4326	7.491906	48.44834	Undetermined	Settlement
	Patriarche_67	9 Obernai		4326	7.489412	48.45702	Pobed	Settlement
	Patriarche_67	10 Obernai		4326	7.499934	48.481506	Survey	Settlement
	Patriarche_67	11 Obernai		4326	7.4817486	48.46683	Undetermined	Settlement
	Campagnes entre Moselle et Rhin	12 Obernai	Haywiller	4326	7.47803	48.44634	probed	Settlement
	dans l'Antiquité (Ch.-Mo_Rh_Ant)	13 Obernai	Hauel	4326	7.4887247	48.46828	Survey	Settlement
		14 Obernai	Planzen/Gros. Immerschenfeld	4326	7.50318	48.479618	Survey	Settlement
		15 Obernai	Kirblach	4326	7.5165734	48.475246	Survey	Settlement
		16 Obernai	Nevenbrunnen/Sandgrube/Buehl	4326	7.5131536	48.466373	Excavated	Settlement
	Patriarche_67	17 Niedernai		4326	7.5266366	48.449455	Survey	Settlement
	Patriarche_67	18 Niedernai		4326	7.5266366	48.449455	Survey	Settlement
	Patriarche_67	19 Niedernai		4326	7.5266366	48.449455	Survey	Settlement
	Patriarche_67	20 Niedernai		4326	7.5266366	48.449455	Survey	Settlement
	Patriarche_67	21 Niedernai		4326	7.523032	48.44542	Survey	Settlement
	Patriarche_67	22 Niedernai		4326	7.513043	48.44226	Undetermined	Settlement
	Ch.-Mo_Rh_Ant	23 Niedernai	Foegel	4326	7.5236325	48.447575	Survey	Settlement
		24 Bischoffsheim	South of the village	4326	7.49145	48.48191	Survey	Settlement
		25 Bischoffsheim	Rue du Château	4326	7.488369	48.488514	Survey	Settlement
	HabitatsBF3-Aug	26 Bischoffsheim	Bruehling	4326	7.483333	48.483334	Undetermined	Settlement
Early Medieval Settlement 'noise'	Patriarche_67	1 Niedernai		4326	7.5286355	48.438007	Literature	Unknown
	Patriarche_67	2 Niedernai		4326	7.5286355	48.438007	Not documented	Unknown
	Patriarche_67	3 Niedernai		4326	7.5036197	48.447628	Literature	Unknown
	Patriarche_67	4 Niedernai		4326	7.5036197	48.447628	Literature	Unknown
	Patriarche_67	5 Niedernai		4326	7.5286355	48.438007	Not documented	Unknown
	Patriarche_67	6 Niedernai		4326	7.5036197	48.447628	Literature	Unknown
	Patriarche_67	7 Niedernai		4326	7.5286355	48.438007	Literature	Unknown
	Patriarche_67	8 Niedernai		4326	7.5036197	48.447628	Literature	Unknown
	Patriarche_67	9 Niedernai		4326	7.5286355	48.438007	Not documented	Unknown
	Patriarche_67	10 Niedernai		4326	7.5286355	48.438007	Literature	Unknown
	Patriarche_67	11 Niedernai		4326	7.513043	48.44226	Literature	Unknown
	Patriarche_67	12 Niedernai		4326	7.513043	48.44226	Literature	Settlement
	Patriarche_67	13 Bischoffsheim	Rue des Moutons	4326	7.4951515	48.485092	Probed	Settlement
	Patriarche_67	14 Bischoffsheim		4326	7.496151	48.485584	Not documented	Unknown
	Patriarche_67	15 Bischoffsheim		4326	7.496151	48.485584	Not documented	Enclosure
	Ch.-Mo_Rh_Ant	16 Bischoffsheim	Rue des Moutons	4326	7.495211	48.489582	Foot survey	Settlement
	Patriarche_67	17 Obernai	Eglise Saints-Pierre-et-Paul	4326	7.4816866	48.46359	Literature	Ritual
	Patriarche_67	18 Obernai		4326	7.4867816	48.45816	Not documented	Settlement
	Patriarche_67	19 Obernai		4326	7.4867816	48.45816	Literature	Settlement
	Patriarche_67	20 Obernai		4326	7.486806	48.447495	Literature	Settlement
	Patriarche_67	21 Obernai	Chemin du Leimtal	4326	7.4914927	48.454853	Not documented	Circulation
	Patriarche_67	22 Obernai	Chateau d'Oberkirch	4326	7.4728103	48.464264	Literature	Settlement
	Patriarche_67	23 Obernai	1 Rue Athic	4326	7.4788284	48.46248	Not documented	Settlement
	Patriarche_67	24 Obernai	Oberlinden	4326	7.472986	48.463272	Literature	Settlement
	Patriarche_67	25 Obernai		4326	7.4827495	48.461376	Probed	Settlement
	Patriarche_67	26 Obernai		4326	7.4828224	48.461464	Not documented	Settlement
	Patriarche_67	27 Obernai	1 Rue Athic	4326	7.4788284	48.46248	Not documented	Settlement
	Patriarche_67	28 Obernai		4326	7.489412	48.45702	Probed	Settlement
	Patriarche_67	29 Obernai		4326	7.4817486	48.46683	Not documented	Settlement
	Patriarche_67	30 Obernai		4326	7.465851	48.469086	Foot survey	Unknown
	Ch.-Mo_Rh_Ant	31 Obernai	Centre-Ville	4326	7.481352	48.462234	Excavated	Unknown
	Patriarche_67	32 Bernardswiller		4326	7.462167	48.444595	Literature	Unknown
Early Medieval Burials	Patriarche_67	1 Niedernai		4326	7.513043	48.44226	Literature	Funerary
	Patriarche_67	2 Niedernai		4326	7.513043	48.44226	Literature	Funerary
	Patriarche_67	3 Niedernai		4326	7.513043	48.44226	Literature	Funerary
	Patriarche_67	4 Niedernai		4326	7.511039	48.456482	Excavated	Funerary
	Patriarche_67	5 Niedernai		4326	7.511039	48.456482	Excavated	Funerary
	Ch.-Mo_Rh_Ant	6 Niedernai	Kirchbuehl	4326	7.5109754	48.457428	Excavated	Funerary
	Ch.-Mo_Rh_Ant	7 Niedernai	Todtenbreitel	4326	7.5196924	48.45797	Excavated	Funerary
	Patriarche_67	8 Obernai	Eglise Paroissiale	4326	7.4818306	48.463673	Not documented	Funerary
	Patriarche_67	9 Obernai	Eglise Paroissiale	4326	7.4818306	48.463673	Not documented	Funerary
	Patriarche_67	10 Obernai	Eglise Paroissiale	4326	7.4818306	48.463673	Not documented	Funerary
	Patriarche_67	11 Obernai		4326	7.493516	48.47711	Probed	Funerary
	Patriarche_67	12 Obernai		4326	7.493516	48.47711	Probed	Funerary
	Patriarche_67	13 Bischoffsheim		4326	7.4889064	48.487236	Not documented	Funerary
	Patriarche_67	14 Bischoffsheim		4326	7.4889064	48.487236	Not documented	Funerary