# Knowledge-scapes as an Alternative to Long-term Geo-determinism in Travelling and Movement

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***Abstract***

Human groups use similar routes of communication to travel between two points in the long-term, not because of the influence of geography, but because geography involves a knowledge-scape that is passed on through generations of travellers. Thus, geography is not an entity that eliminates human agency, but rather it is the place where the practical and technical knowledge necessary to travel between two points is passed down between generations of voyagers which, subsequently, causes them to use similar itineraries. To explore these ideas, pre-modern travelling around the Bay of Biscay, between northern Iberia and western France, is employed as a case study. The interval analysed is placed between the Bronze Age, when the coasts of the bay started to resemble those of today, to Late Antiquity, when pre-modern orientation methods started to be replaced by modern ones (2300 BC–AD 1000). This study focuses on sea routes, which are analysed using archaeological evidence and written sources, although the same ideas could be applied to land routes.

## Introduction

The idea that human behaviour is influenced by geography dates back to antiquity (Gates 1967; Isaac 2004: 108). This notion was introduced to the social sciences through Herbert Spencer's ideas of environmental determinism or geo-determinism (Milton 1997; Peet 1985: 310; Thomas 1925: 10). Environmental determinism argues that geography is the main driving force in history that makes people behave in certain ways (Johnston 2017). In the *Annales* school, this view was embedded into Braudel's *longue-durée* (Braudel 1958: 731, 1972: 23; Kinser 1981: 69; Knapp 1992: 6). Braudel divided time into three levels: long-term, medium-term and short-term. The first level is concerned with geography (e.g. mountains, seas, climate) and its slow-changing influence in history (Braudel 1972: 23). The second is beyond the scope of this study and

the third analyses ephemeral events caused by individual actions (Braudel 1972: 901). Unknowingly, by separating human action and the influence of geography, Braudel created a dilemma which he never properly addressed. Which is more important, the influence of geography in the *longue-durée* or the capacity of individuals to overcome it (Bintliff 1991: 8; Robb and Pauketat 2013: 12)?

In archaeology, this dilemma has been approached in four ways. Bintliff (1991: 14, 2004, 2018), based on the third generation of the *Annales* school, argues that the long and short terms influence each other. This is criticised by the second group of archaeologists who have addressed this issue. They strongly criticise the idea that people from different periods and with different world-views could react identically to long-term influences (Gosden 1994; Harding 2005). This issue is considered below. The third approach comes from the *Time perspectivism* school, which argues that the long and short terms are different research methods, meaning it is unnecessary to discuss their relation (Bailey 1981, 2008: 23; Holdaway et al. 2008). Finally, some authors have employed Braudel's *longue-durée* in the study of the relationship between communities and the bodies of water on which they lived. However, when discussing routes and travelling in the *longue-durée*, Braudel's problematic separation between human action and the influence of geography resurfaces and they are met with difficulties when trying to marry the latter with the voyager's agency (e.g. Broodbank 2013: 95; Chaudhuri 1985: 5, 130; Cunliffe 1999: 93).

This paper attempts to solve Braudel's problematic separation between human action and the influence of geography in relation to travelling using 'knowledge-scapes' and the orientation system used by pre-modern voyagers; what Ingold (2000: 237, 242) labels 'ordinary wayfinding'. It also incorporates Ingold's term 'wayfaring', that is the way pre-modern travellers experience movement (Ingold 2007: 75). The model presented understands the routes employed in the *longue-durée* as the outcome of a complex long-term relationship between geography and travellers. Travellers use geographical landmarks, such as mountains, stars or water bodies, including their changing surroundings (e.g. smells, clouds, fauna), to find their way between two points. That knowledge, which is only known by experienced voyagers, is transmitted *in situ* between them in the *longue-durée* in the form of similar routes. Due to this, knowledge and routes are kept alive and are used by different generations of voyagers in the long-term. Thus, in this model, geography is not an entity that eliminates travellers' agency, but rather it is a non-human agent with which they interact.

This study has two parts. In the first, the model and the concept of knowledge-scapes, wayfinding and wayfaring are explained. The second part examines these ideas and applies them to the sea routes which were used to travel around the Bay of Biscay between the Bronze Age and Late Antiquity (2300 BC–AD 1000). The case study serves to address three problems that the model presents.

## Knowledge-scapes, wayfinding and wayfaring

Knowledge-scapes are the different contexts in which knowledge is learned (Matthiesen 2009). The difficulty lies in defining context and knowledge. 'Knowledge' is defined here according to Ingold's (2000: 316) definition regarding technology. He differentiates between 'technical knowledge' and 'practical knowledge' or 'skill'. Technical knowledge is knowledge passed on from a teacher to a student. It is explicit, objective and transmitted through words. Importantly, it does not have to be taught in the context where it is practised. Conversely, practical knowledge is learned by imitation and practice. It is tacit, subjective, and can only be taught by practising it. Thus, it cannot be learned outside the context where it is employed. According to Ingold (1990: 8; 2000: 316–319), practical knowledge has been devalued in modern times, and technical knowledge is considered indispensable, while in pre-modern societies, both were important and were learned simultaneously (see also Hallpike 1979: 126).

In practice, therefore, knowledge-scapes in pre-modern societies were the contexts in which knowledge was transmitted as technical knowledge and simultaneously recreated, or put into practice, as practical knowledge. Thus, when representing knowledge-scapes as a diagram, they have two components (fig. 1). The first is technical and practical knowledge and the second

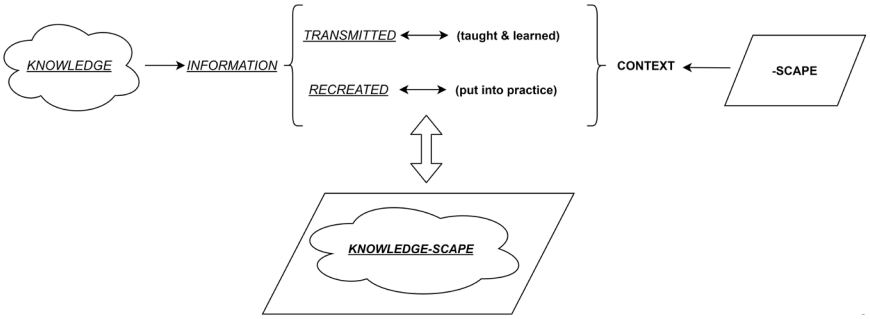


Figure 1 The two components of knowledge-scapes: knowledge and -scape.

is 'scape'. An example of a knowledge-scape is when the sailors from the Southern Pacific are accompanied by their apprentices on their voyages (Gladwin 1970: 143). While guiding the ship, they teach their pupils which winds and stars must be followed to successfully move between two islands and how to do it. During this process, old technical and practical knowledge is put into practice and transmitted to the next generation of travellers.

There is plenty of evidence to suggest that pre-modern voyagers have always had the ability to travel between two points using landmarks as reference (Parker 2001). In fact, anthropological studies show that non-western groups possess an acute awareness of the space which they inhabit (Chapman and Chapman 2005: 45–46). Unlike the modern space, which is quantifiable and divided into coordinates, pre-modern space is abstract and divided into 'places', which can be anything from a valley to a singular tree. When travelling between two points, travellers memorise stories about the places which they must cross and the instructions they must follow to safely move between them. These instructions are passed down between generations and are codified in myths or tales that served as guidebooks to travellers (Ingold 2000: 219; Tilley 1994: 31–34). This way of understanding pre-modern travelling was originally defined by Gell (1985: 273) and was labelled, based on previous studies, as 'practical wayfinding'. Later, it was modified by Ingold (2000: 239–242) and relabeled 'ordinary wayfinding'. He emphasised that voyagers not only learn the places that must be found and crossed, but also the changing environmental details (e.g. colours, light, wind) that surround them.

This way of understanding wayfinding is related to Ingold's concept 'wayfaring'. This refers to an attitude towards movement which is uncommon in modernity (Ingold 2007: 75). Thus, while wayfinding is an orientation system, wayfaring is thought of as a way of experiencing travelling (see Lanng and Jensen: 2016). In modernity, travelling is "destination-oriented" (Ingold 2011: 150) and considered an uneventful affair. People are transported by trains or cars and the space they cross is inconsequential compared to the destination. Conversely, wayfarers must find their way through a landscape as if it were a labyrinth, using its changing environment as a guide (e.g. smells, light, wind). This means every journey is different even if the itinerary followed is similar (Ingold 2015: 133). Moreover, travellers are expected to be changed by their experiences, while transport in modernity is mostly a

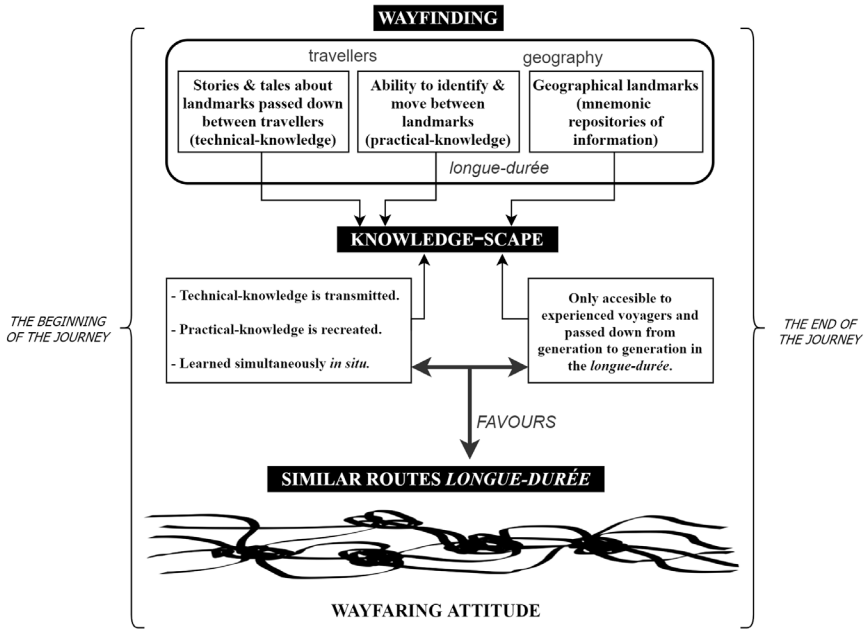


Figure 2 How knowledge-scapes allowed similar routes to be employed in the *longue-durée*.

routine formality (Ingold 2007: 96). Therefore, in wayfaring, moving or path-finding is as relevant as the aim of the voyage itself (Ingold 2007: 81–90).

As such, wayfinding and wayfaring together constitute telling a story that contains a description of the places that must be found and crossed and the personal odyssey of doing so. Importantly, unlike maps, these descriptions can only be used to travel between two points (Gell 1985: 274–275; Ingold 2000: 238) and are accompanied by practical knowledge that is learned by imitation.

However, wayfinding (setting aside wayfaring for a moment) does not allow new travellers to introduce radical changes to a route. This is evidenced in the Southern Pacific, where a complex package of information was created over many centuries allowing voyagers to travel between a myriad of islands by crossing between them in particular combinations (Lewis 1972: 20–27). This means that not only does wayfinding favour repetition but that it is also likely to be passed down unchanged for generations. This, in turn, indicates that travellers follow

routes in the *longue-durée* not because geography forces them to do so, although it does play a role, but because they learn about them in knowledge-scapes.

In the *longue-durée*, the knowledge transmitted in knowledge-scapes would have encouraged travellers from different periods to use the same routes. This was the result of a complex long-term relationship between geography and successive generations of travellers. This relationship, represented as a diagram (fig. 2), has three components. The first component is the wayfinding method employed to travel between two points and which includes the geographical landmarks or places that have to be crossed to reach a destination, the technical knowledge in the form of tales about those landmarks, and the practical knowledge which serves to identify and allow movement between them. In this model, geography, in the form of geographical landmarks, is not an entity that eliminates people's agency, but rather a mnemonic repository of information linked to the knowledge required to move between two points. The second component is the 'knowledge-scape' whereby previous knowledge is passed down between voyagers and is recreated. Both the technical and practical knowledge are the product of travellers and geography interacting together in the *longue-durée* and are only accessible to experienced voyagers who pass the knowledge down from generation to generation, keeping it alive. Therefore, similar routes can be used in the long-term. Finally, these routes are followed with the employment of a wayfaring approach.

## Case study

The approach to knowledge-scapes and long-term travelling represented in Figure 2 presents three problems. Firstly, it can be equally deterministic as it reportedly transfers determinism from geography to the knowledge transmitted in the *longue-durée*. Secondly, voyagers from different times who may or may not have different worldviews, such as Roman and Bronze Age travellers, experienced the same space as different landscapes. Consequently, they should not understand the same knowledge in the same way. Finally, changes in the coastline and/or technology affect how people move in the *longue-durée*. To address these issues, the previous approach to knowledge-scapes and travelling is applied to a case study that also serves to illustrate how it works. The case study analyses the similar sea routes which were used in the Bay of Biscay (hereafter referred to as 'the Bay') between northern Iberia and western France during four subsequent periods of time: Bronze Age, Iron Age, the Roman Period and Late Antiquity.

For the Early Bronze Age (2300–1700 BC), the distribution of two types of objects is a good reflection of the routes used to travel around the Bay (fig. 3A). The first object is the gold plates found in southern Iberia, the Basque area and western France (Eluère 1982: 35; Pingel 1992). They are interpreted as the result of a communication route between those areas (Alday-Ruiz 1999: 154). The second type of object is the 'Lothéa-Agua Branca' swords that have been found in northwest Iberia and Brittany and are interpreted as being the result of contact between those regions (Briard 1998: 114; Ruiz-Gálvez Priego 1998: 135). In the Middle Bronze Age (1700–1200 BC), it is argued that Atlantic Iberia was isolated from the rest of Atlantic Europe due to the absence or scarcity of metal objects, such as spearheads or palstaves, which were common in Atlantic Europe (Burgess and O'Connor 2008: 42; Gibson 2000: 73). An example of this is the distribution of razors and different types of Bronze Age pins that were only recovered in the French regions of the Bay and reached Iberia later (de Melo et al. 2017: 793; Harrison 2004: 163) (fig. 3B). Finally, regarding the Late Bronze Age (1200–700 BC), there is consensus about Atlantic Europe, including the

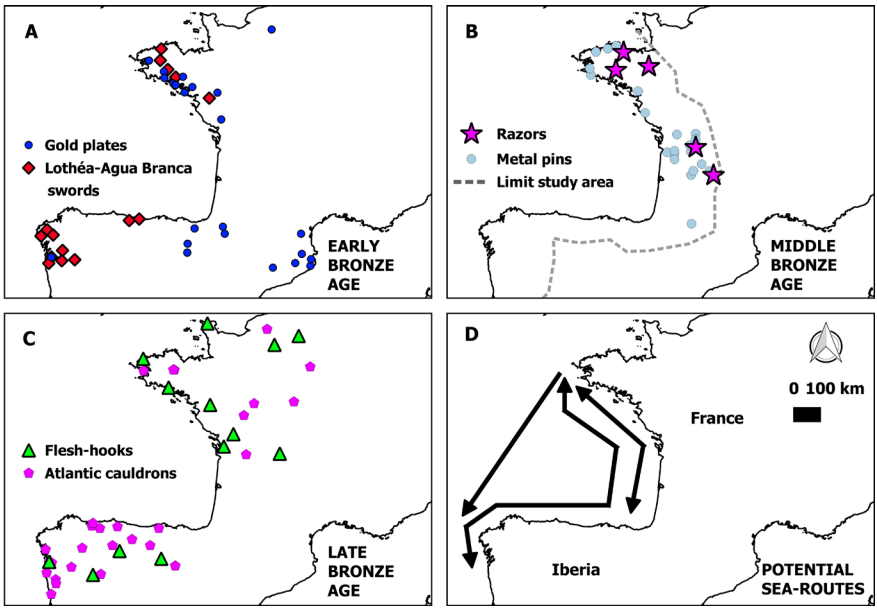


Figure 3 Distribution of metal artefacts around the Bay of Biscay during the Bronze Age and possible sea-routes used. The artefacts of the Early and Middle Bronze Ages are part of an ongoing research project by the author. The distribution of flesh-hooks and Atlantic cauldrons in the Late Bronze Age are based on Needham and Bowman (2005) and Gerloff (2010) respectively.

Bay, being connected and forming a large network of contacts (Brun 1991; Cunliffe 2001: 275). An example of this is the distribution of Atlantic cauldrons and flesh-hooks (fig. 3C) (Gerloff 2010; Needham and Bowman 2005: 129).

The distribution of these artefacts during the Bronze Age suggests that three overlapping routes were used. One connected Brittany directly to north-western Iberia, one linked the French coast, whilst another bridged the coasts of the Bay by sailing parallel between them (fig. 3D). These routes, among others, are proposed in a study by Callaghan and Scarre (2017: 364) concerning the prehistoric sea routes that were used to cross the Bay. The distributions discussed above suggest that the first and third routes were active during the Early and Late Bronze Ages whilst the second was used during the Middle Bronze Age. Below, it is shown how similar routes were employed later in time and it is argued that this was the result of them being passed down from generation to generation. This was possible because geography was part of a 'knowledge-scape' that contained information accumulated over generations and travellers taught each other how to access that knowledge, facilitating the use of the same routes in the *longue-durée*.

Nevertheless, this knowledge did not force travellers to follow the same routes in all periods like automatons, which is the first of the three problems mentioned above. The different but similar routes followed during the Bronze Age show that voyagers did not use all routes simultaneously. They suggest that people chose which routes to follow according to the historical particularities of each period. This indicates that we should not understand the knowledge transmitted in 'knowledge-scapes' as a set template, but rather as a package of routes that sailors used depending on the particularities of their time (Ingold 2011: 161).

The Iron Age (700 BC–120 BC/AD 20) has been considered to be a period during which contact between the regions of Atlantic Europe, including the Bay, declined (Cunliffe 2001: 308–310). However, two elements point to the opposite. On the one hand, there are similarities in urbanism between Iberian and British hillforts (fig. 4A) (Almagro-Gorbea 1995; Berrocal-Rangel et al. 2019; Cunliffe 2001: 337; see also González-Ruibal 2004). They suggest contact across the Bay between Atlantic Iberia and Britain. On the other hand, there are the several exploration voyages from Mediterranean travellers described by classic authors (Roller 2006: 1–8). For example, the Periplus of Himilco, the Punic explorer that reached Ireland from Gibraltar crossing the Bay (Carpenter 1966: 212–214); the Massiliote Periplus, a

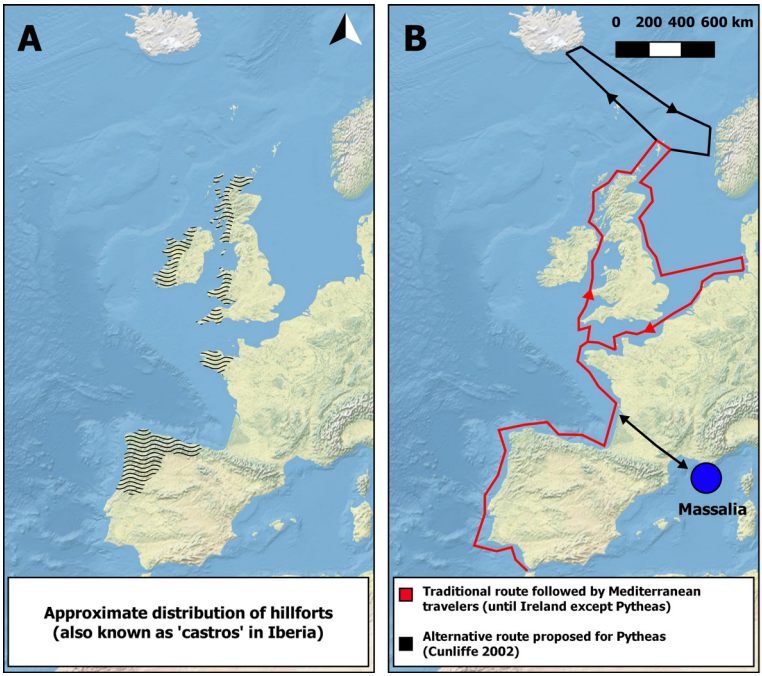


Figure 4 A) Areas with characteristic settlement forms in Iron Age Atlantic Europe. Modified from Cunliffe (2001: 337, fig. 8.16) B) Possible routes followed by Mediterranean travellers during the Iron Age.

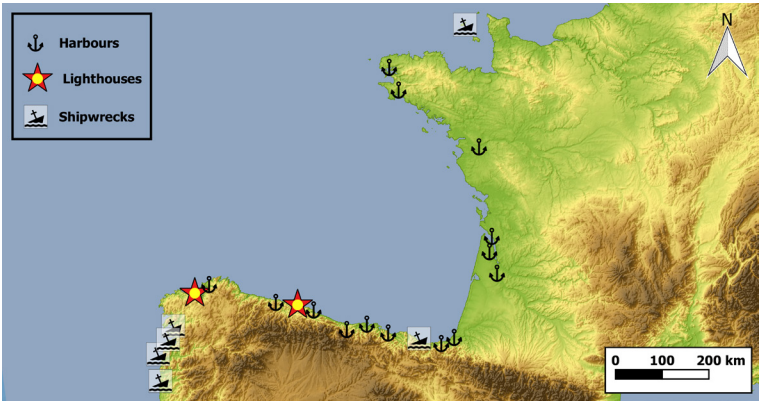


Figure 5 Distribution of Roman harbours, lighthouses and shipwrecks around the Bay of Biscay during the imperial period. References in the main text.

journey from Marsella to the English Channel encircling Iberia (Roller 2006: 9–12); and the periplus of Pytheas the Greek, who also travelled from Marsella to Brittany but crossing France through the Garonne river and who reached Iceland by encircling Britain (Cunliffe 2002) (fig. 4B). All this shows that the routes used to travel during the Iron Age were similar to those of the Bronze Age, suggesting they had been inherited from the previous period.

This leads us to the second of the three problems mentioned above. How could voyagers with different worldviews, such as Mediterranean travellers and Bronze Age sailors, use the same indications to travel if they experienced the Bay as different landscapes? The answer is that the knowledge that was passed down between generations of voyagers was part of a long-term knowledge-scape that existed in the *longue-durée* and which connected people with different worldviews to the same knowledge of the sea, the stars and other elements unknown to non-practitioners. Consequently, that knowledge constituted a timeless and cross-cultural 'community of practice'. Community of practice has been defined as a group of people from the same or different 'culture' with a common interest or preoccupation for something they practice and learn (Wenger 1998: 72, 125). In the case of the Bay, travellers, thanks to long-term knowledge-scapes, were part of a *longue-durée* community of practice whose members, individuals from different times and regions, learned how to find their way around the Bay in similar ways. Due to this, voyagers with different worldviews could use the same indications to move around the Bay following similar itineraries.

Romans avoided the Bay until they completely conquered northern Iberia at the beginning of the first century AD (Carreras and Morais 2012: 436–439; Fernández Ochoa and Morillo 1994: 177–178; Morillo et al. 2016: 178). Between then and the decline of the Roman Empire during the fourth century AD, a sea route that went from north-western Iberia to Brittany, parallel to the coast, was followed by Roman ships (Torres Sevilla-Quiñones de León 2003: 232). Some authors believe it was a secondary route (Fernández Ochoa and Morillo 2013: 78; Morillo et al. 2016: 281), while others argue that it was an extremely important one (Carreras and Morais 2012: 433–439; Rubio-Campillo et al. 2018: 45; Sáez Taboada 2001: 262). Either way, there is plenty of evidence to suggest Romans used it. This evidence includes the construction of two of the few lighthouses built in the Roman Empire (Fernández Ochoa and Morillo 2010), the discovery of Roman shipwrecks (Morillo et al. 2016: 274) and the archaeological and/or written evidence of numerous Roman harbours

(fig. 5) (Fernández Ochoa and Morillo 1994; Hugot and Tranoy 2010; Morillo et al. 2016: 268–272). Some authors believe that this route was based on previous ones used by indigenous groups since the Neolithic. In fact, they argue that crewmembers on the Roman ships were probably natives with first-hand knowledge of the routes (Berthault 2013; Camino Mayor and Villa Valdés 2003; Morillo et al. 2016: 267). These views fit perfectly with the model presented.

However, this model leaves the last of the three problems mentioned above unexplained, that is, how the routes transmitted over time were modified by transformations in navigational capabilities and/or sea-level changes. This paper argues that, if the latter two changed, the itineraries followed by voyagers would most likely also be modified. Nevertheless, in the case of the Bay, there is evidence that, during the interval analysed, navigational capabilities and the sea-level of the Bay did not change. Concerning the latter, studies show that the coastline of Atlantic Europe has suffered minor and slow transformations since approximately the third millennium BC and this is also the conclusion of local sea-level studies in regions of the Bay (Cearreta and Leorri 2009: 129; McGrail 2014: 258; Millán 2010: 166; Rego et al. 2009: 36; Stéphan and Goslin 2014: 13–14; Van de Noort 2011: 54; Zazo 2006: 123). This means that, since at least

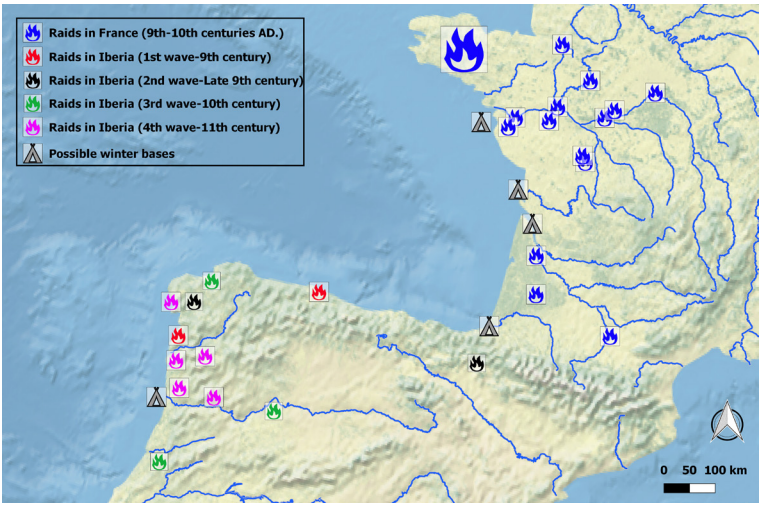


Figure 6 The Viking presence in the Bay of Biscay (based on Baudoin 2009; Christys 2015; Morales Romero 2004, 127–214; Price 1989; Sánchez Pardo 2010).

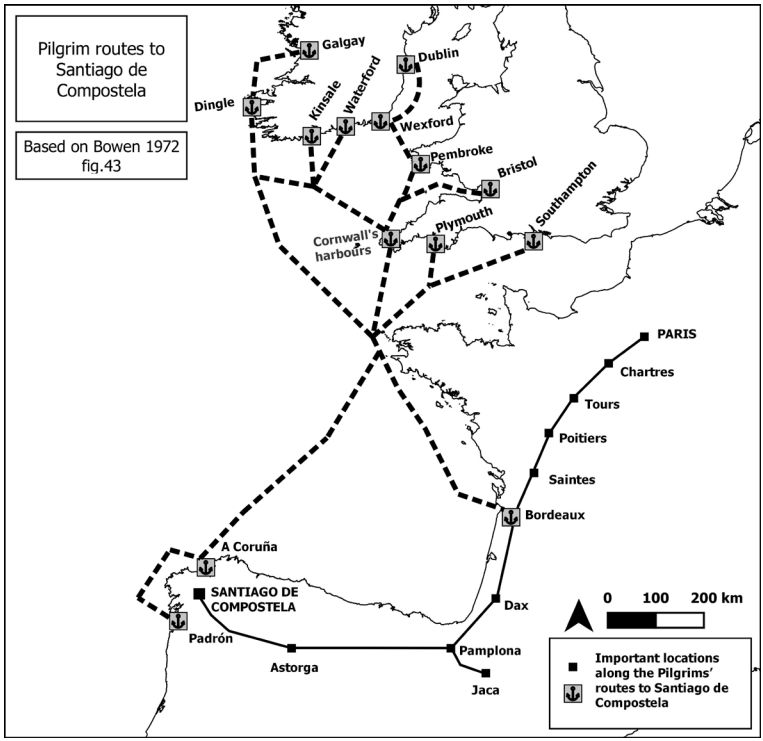


Figure 7 Pilgrims' routes to Santiago de Compostela (modified from Bowen 1972: 119, fig. 43).

the beginning of the Bronze Age, the coast of the Bay has not changed radically and that voyagers from subsequent periods moved across the same geography.

Concerning changes in navigational capabilities, pre-modern navigation was very similar until the end of the Middle Ages (McGrail 2001: 247; Rose 2013: 440). Between the twelfth and fifteenth centuries AD, new orientation techniques, which were the opposite of wayfinding and are labelled 'quantitative navigation', were introduced (McGrail 2014: 275; Needham 1971: 554–560). They employed new tools, such as compass, charts or astrolabes, that allowed sailors to calculate their approximate position and navigate without using geographical landmarks and their environmental surroundings (e.g. winds, clouds, fauna) as reference. As such, travellers were able to develop new routes and they were not limited to those learned *in situ* from others through knowledge-scapes like previous sailors.

Finally, during Late Antiquity, we know that Vikings and Christian pilgrims sailed across the Bay. Between the eighth and eleventh centuries AD, there is evidence of numerous Viking raids in the Bay (Christys 2015: 12–13; Morales Romero 2004: 84; Price 1989: 13; Sánchez Pardo 2010: 59–60). However, there is no agreement about the dates of the attacks or the places where they spent the winter (fig. 6). Nevertheless, authors agree that in the case of France, most attacks happened before the ninth century AD, while Iberian attacks are divided into four (sometimes five) waves dating between the 840s and the twelfth century AD (Baudoin 2009; Christys 2015; Morales Romero 2004: 224–225; Sánchez Pardo 2010: 70). Vikings did not sail across the Bay but rather followed a route that was parallel to the coast from Brittany to Portugal and used rivers to reach the interior. These were most likely old itineraries learned from local sailors (Cunliffe 2001: 515; Morales Romero 2004: 72).

Similarly, during the first few centuries of the first millennium AD, pilgrims from the English Channel travelled to Santiago de Compostela to visit the shrine of St James (Antón Vilasánchez 1998; Dunn and Davidson 2000). They embarked from Irish and English ports and travelled to Santiago following several routes (fig. 7) (Bowen 1972; Storrs 1998). It is believed that they were following itineraries established in previous periods and, based on the routes used in the Bay before Late Antiquity, it seems that was the case (Bowen 1972: 115; Miraz Seco 2013: 101; Tate 1990: 9). Pilgrims and Vikings show that the Bay was still sailed across between the fall of the Roman Empire and the Early Middle Ages and that the routes used were similar to those followed previously. The reason for this is that the knowledge-scapes that were used in previous periods, and which were shared between voyagers in the *longue-durée*, were still alive.

## Conclusion

The main focus of this paper has been to criticize the view that travellers from different periods used similar itineraries to travel across an area due to the influence of geography. Opposing this, it is argued here that the routes used in the long-term are transmitted by generations of travellers through knowledge-scapes. An example of this is the Bay of Biscay between the Bronze Age and Late Antiquity. Knowledge-scapes were defined as the different contexts in which knowledge is learned. In the case of travelling, they are the voyages in which the practical and theoretical knowledge necessary to move between two points is passed down from experienced travellers to novices. During these journeys, voyagers find their way using geographical landmarks as a guide

and the knowledge inherited from their predecessors to move between them. Thus, in this model geography is not an entity that forces voyagers to follow certain itineraries, but rather it is a significant part of a long-term knowledge-scape that is only accessible to travellers, explaining why similar routes are employed in the *longue-durée* without using long-term geo-determinism.

## Acknowledgements

This article is based on the work completed during my doctoral research about connectivity in the Bay of Biscay during the Bronze Age. My thanks go to the anonymous reviewers whose insightful comments clarified and improved the quality of this study immensely. Further thanks are due to the editors for their hard work and patience.

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