In Pursuit of the Analytical Unit. Island Archaeology as a Case Study

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The present study offers an epistemological and ontological historiographical review of the concept of the unit of analysis using island archaeology as a case study. We carry out a critical investigation to lay out the main ideas used to define units of analysis, and we consider the discourse that has emerged between this and other fields when defining such a concept. From an epistemological point of view, we can define three distinct strategies: first, those that define units of analysis by their outer limits, their borders; secondly, those that make the definition based on the internal dynamics taking place within the units of study; and in third place, strategies that focus on defining the analytical unit as a set of interactions between agents. From a more ontological point of view, we can differentiate between strategies that take on a categorical perspective and those that take on a more relational perspective. Ultimately, we reflect on the conceptualization and function of the unit of analysis in the process of interpretation, and in so doing, we provide evidence of the great theoretical richness of the concept and the multiple interrelated factors involved in its development.

> Islands are slippery as metaphors. They are neither entirely different from the rest of the world nor exactly like it. (Broodbank 2000, 33)

Introduction

When setting out to study island communities, we are first confronted with a problem: defining the unit of analysis and ensuring that it is appropriate for the scientific goals that we have laid out. At first glance, the island is a well-defined geographic space, a seemingly good choice for the unit of study. However, in many cases, this approach does not capture historical factors that must be considered. As Broodbank (2000, 16) mentions, this imbalance can be related to two points: one concerning the wide range of theoretical approaches used in analyses of island communities, and the other concerning the range of islands that exist, from small ones to those that could be considered continents. Then, there are islands located very close to some main body of land (which have therefore been in constant fluid dialogue with continental dynamics) and others that are at great distances from larger bodies of land. Some, at points in their history, have been key parts in enormous connectivity networks, while others remained isolated. And of course, between all of these extremes, there is a multitude of intermediate situations.

However, beyond the variability in island contexts, researchers have spent decades reflecting on the heuristic ability of the idea of the island to serve as a unit of analysis. Of note in this regard is the body of work published by Fitzpatrick (2004), which includes many authors debating whether islands should be considered useful units of analysis. The debate continues today. Recently, Terrell (2020) reiterated the doubts that he raised in a previous article (Terrell 2004) about whether islands actually have the ability to serve as valid models and units of analysis that allow for a proper consideration of the complex realities that take place therein.

Cambridge Archaeological Journal 34:4, 583–600
doi:10.1017/S0959774323000501 Received 7 May 2023; Accepted 23 Dec 2023; Revised 4 Oct 2023

Leppard *et al.* (2021a), on the other hand, defend the appropriateness of using islands as units of analysis.

Defining the unit of analysis has been one of the central points of debate in island archaeology as a scientific discipline. It has not only contributed to the development of island archaeology in general, but has provided lines of thought and advanced theories regarding archaeology as a whole. Thus, we have two objectives in studying the units of analysis in island archaeology. First, we wish to analyse how the various approaches have been discussed, focusing on the variables used and theoretical connections with other disciplines. Secondly, we wish to provide more insight into the meaning of the unit of analysis in the process of interpretation in archaeology.

There are many ways to carry out a historiographical analysis of a discipline: internal strategies, external ones, and those that are contextual, critical, praxiological, etc. (Javaloyas Molina 2010). In our analysis, we take an internal approach, stressing an epistemological focus. To do this, we define six bases, or central ideas, that we use to define the unit of analysis in island archaeology.[1] They were envisaged as *constructors* in our analysis, and they allow us to structure the wide range of approaches that have been used. However, reality is more complex and nuanced, and we find concepts that evolve from, overlap with, or are hybrids of others.

We know that this analytical option has positive aspects, but there are also some drawbacks. Of note among the positives is the analytical clarity we obtain, which facilitates comparisons. Among the shortcomings, we must be aware that these central ideas represent a simplification, which is not especially useful when trying to categorize authors and studies with regard to one key idea or another. Nevertheless, the objective of the present study is not to carry out this taxonomic work, but rather to describe the core concepts that have been accepted and used to define units of study in island archaeology, and from there, to reflect on how these base units have evolved and developed.

(Key Idea 1) A portion of land surrounded by water on all sides

This is probably the most common argument made when studying islands, especially when it comes to defining islands as units of study. Here, the unit under consideration corresponds not only to an obvious geographic area, but the idea that underlying biogeographic factors are crucial to the dynamics being analysed. We can trace this focus back to the first anthropological studies of the nineteenth century and the first decades of the twentieth, such as those by Morgan ([1872] 1964, Rivers (1914) and Seligman (1919), who, in line with Wallace and Darwin, understood that isolated spaces like islands led to divergent evolutionary processes among species when compared to continental dynamics. By analogy, isolation would also give way to particular and distinct cultural behaviours. Thus, since the nineteenth century, academics have built a stereotypical idea of islands as separated places whose isolation gives rise to specific, unique processes of evolution (Rainbird 1999; 2007; Spriggs 2008). This stereotypical view of islands can also be traced back for millennia through myths, legends and stories (Edmond & Smith 2003; Fitzpatrick *et al*. 2008; Gillis 2003; Rainbird 1999; 2007; etc.)

During the 1930s, this central concept was reinforced by the incorporation of new theoretical approaches, and one of those that had the most success was the use of a metaphor: *islands as laboratories*. This idea can be traced back to Margaret Mead's (1928) study *Coming of Age in Samoa*. However, it was during the middle of the century that the idea would reach its full potential. As precursors to this movement, we should highlight the publication of three articles in 1957 (Goldman 1957; Goodenough 1957; Sahlins 1957) with a preface by Mead (Mead 1957). Both in Mead's preamble and in the three articles themselves, much stock was given to the idea that islands, because of their clear limits and because they are isolated, represent a good base for defining the unit of analysis and controlling the variables being considered.

Two events would end up reinforcing this approach to defining the unit of analysis: on the one hand, the publication of *The Theory of Island Biogeography* by MacArthur and Wilson in 1967 and, on the other hand, the inclusion of the paradigm derived from ecological approaches into analyses of island communities. From a biogeographic perspective on islands, it was clear from MacArthur and Wilson that the specific and distinctive biogeographic characteristics of islands (smaller dimensions, the barrier effect played by water, and the special climatological and ecological characteristics, underscored by more fragile ecosystems) had turned them into the basic unit of analysis. Thus, variables such as distance to the mainland, islands' dimensions and their interlocked ratios were, and have continued to be, commonly used as the basic elements for defining the unit of analysis. The use of these variables can be traced back over 50 years to seminal works by Allen *et al.* (1977), Diamond (1977), Kaplan (1976), Terrell (1974) and Vayda & Rappaport (1963) for

https://doi.org/10.1017/S0959774323000501 Published online by Cambridge University Press

islands in the Pacific; Keegan & Diamond (1987) for islands in the Caribbean; and Cherry (1981; as well as the 1990 update) for islands in the Mediterranean.

This more biogeographic line was complemented and enriched by the inclusion of the ecological approaches that were in vogue during the 1960s. According to Terrell (1977), the 10th Pacific Science Congress of the Pacific Science Association at the University of Hawaii in 1961 and the corresponding publication of *Man's Place in the Island Ecosystem* by Fosberg (1963) can be considered the starting point for ecological approaches to analysing human dynamics in island environments. However, it is important to highlight that Vayda and Rappaport did not consider all islands to have the same level of isolation or connection (Vayda & Rappaport 1963). Though the unit of analysis continued to be valid, as connectivity and isolation dynamics varied, so did cultural dynamics. Thus, the island can be considered a more-or-less robust unit of analysis.

Although the original acceptance of this key idea comes from biogeography applied to plants and animals, in its adaptation to analysing human behaviour in island environments, nuances were very quickly incorporated, as there are differences between human dynamics and those of other species (e.g. Terrell 1974; 1976; 1977; Vayda & Rappaport 1963). To do this, variables related to technical knowledge and availability, social practices and a historic perspective on island dynamics and processes are included. Nevertheless, it is still the biogeographic variables that define the unit of analysis.

This perspective has been widely used in the study of prehistoric island communities, although it has had differing impacts on the different academic fields in which it has been used. This approach has predominated in studies of Pacific islands, where the principles derived from new archaeology have provided the predominating theoretical framework compared to studies of Mediterranean and Caribbean islands.

This approach (Key Idea 1) continues to be a popular strategy, though it has been updated and nuanced, as can be seen in the contributions of numerous authors (e.g. Anderson 2018; Cherry & Leppard 2018a, b; Di Napoli & Leppard 2018; Fitzpatrick *et al*. 2008; Giovas & Fitzpatrick 2014; Leppard 2014; 2015; Leppard *et al.* 2021a, b; 2022; Pilaar Birch 2018; Plekhov *et al.* 2021; Shipton *et al.* 2021; etc.)

The success of this approach stems mainly from its ability to define variables, establish categories and generate models that aim to overcome singular points of view in the pursuit of coming up with more comprehensive models and comparisons.

(Key Idea 2) Islands are what they are because they are living spaces (habitats) surrounded by radical shifts in habitat

One important variation on the definition of the unit of analysis, which is much more tied to an ecological point of view, was proposed by Terrell (1999; 2008), who suggests that the differentiating factor of islands is specifically the radical split between habitats, i.e. those in terrestrial environments and those in aquatic ones. Terrell understands the significance of defining this radical split between habitats, e.g. analysing the manner and frequency with which certain species (plant, animal and human) can move back and forth between both. According to Terrell (1999, 241), the delineation of these boundaries and the ability of certain species to cross them is what should define the unit of analysis. However, as with Irwin (1989; 1999), Terrell insists on the need not mechanically to associate islands with isolation.

In any case, using the island as the unit of study, Terrell (1999) includes two caveats that had already been suggested by Leach (1961): the definition itself of the unit of analysis could be both the explanation of the dynamics that we see within, leading to a circular discourse, and the explanation for the fact that the diversity that we find between different islands or units of analysis tends to be explained by the internal dynamics of each island more than by the association between them. He insists that there is not necessarily a relationship between the geographical boundaries of islands and the social boundaries of islanders. But this is not a defense of a rigid or mechanical use of islands as units of study. Instead, they are understood as elements that are more-or-less stable, and from which comparisons and analytical strategies can be derived.

Ultimately, beyond the use of islands as units of study, this angle introduces the need for a historical perspective on island dynamics and processes. It is not mandatory that this perspective be included in the definition of the unit of study, but it should be considered among the many dynamics related to the unit. Along this same line, we can find Irwin (1999, 52) and Bevan and Conolly (2013, 6) with two further arguments: first, islands should not be equated with isolation: instead, their social dynamics should be considered alongside their geographic and historical contexts; and second, the mechanical use of islands as units of analysis and their correlation with isolation have often prevented the inclusion of the

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role that the sea and sailors have played in shaping island dynamics. Other authors follow this line, too (e.g. Boomert & Bright 2007; Fitzpatrick *et al.* 2007; Rainbird 2007).

This perspective is the one taken by approaches that see islands as model ecosystems, such as those derived from historical ecology and analyses of the ecological impact that human colonization has had on islands (e.g. Anderson 2002; 2018; Douglass & Cooper 2020; Fitzpatrick & Erlandson 2018; Fitzpatrick & Keegan 2007; Fitzpatrick *et al.* 2007; French *et al.* 2020; Harris & Weisler 2018; Kirch 2007; Kirch *et al.* 2012; Leppard 2017; Leppard & Pilaar Birch 2016; McLaughlin *et al.* 2018; Nogué *et al.* 2017; Rick *et al.* 2013; 2020; Russell & Kueffer 2019; Siegel 2018; Swift *et al.* 2017; 2018; etc.).

(Key Idea 3) Cultural units

In parallel to the understanding of islands as units of study, another strategy has been used in anthropology: one in which cultural traits override biogeographic parameters. The basic origin of this idea can be traced back to work by Boas (1949) and the development of the concept of culture areas. As per Goldman (1955, 680), in using cultural units to define the unit of study for island groups, 'a culture area comprises historically related societies each showing significant variations from a common area pattern'. Indeed, this is the very concept underlying works by Sahlins (1957), Goldman (1957) and Goodenough (1957): direct precursors to the idea of islands as laboratories. When it comes to defining the unit of study in Polynesia, these authors thought beyond clear biogeographic limits to demarcated cultural units (Spriggs 2008, 216).

This strategy has been used in more or less the same way up to today, even amongst those who consider islands to be nuanced units of study (for a synopsis in the Caribbean islands, see Curet 2004). We can also find its influence on authors, such as Irwin (1992, 260), who claimed that 'Polynesian society was commonly less insular than its islands.' This can be related to the colonization dynamics of Polynesia, which, in contrast to Melanesia and Micronesia, was colonized rapidly, and the islands share some common traits. For example, their languages are more or less mutually intelligible, an important factor that has led to a certain level of cultural unity.

(Key Idea 4) Islanders as maritime communities

Another starting point for defining the unit of analysis relies on the idea that it should be primarily associated with social and identity-related variables. One of the first references to this approach comes from a proposal made by Hau'ofa (1993) regarding the men-of-the-sea identity that could be conferred to the inhabitants of the island of Tonga. Along this line, authors such as Eriksen have suggested the use of the unit of study in a sense more metaphorical than geographic, which is related to premises from anthropology and post-processual archaeology (Eriksen 1993, 133).

In his approach, Eriksen uses as his base one of the greatest debates taking place in cultural anthropology, one that began at the end of the twentieth century: up to what point are social, cultural and geographic units of analysis able to define clear borders and distinctions? Eriksen opts to approach the analysis as if it were a continuum of communication, interaction and exchange in which borders, since they are blurry, lose a large part of their interpretive power (Eriksen 1993, 134). Using the island of Mauritius as a case study, Eriksen reflects on the complexity of choosing a unit of study, as it can vary depending on the focus that each researcher chooses to take. Therefore, the author touches on the different levels of connectivity that island communities experience and the need to establish the point to which these differing levels of connectivity affect structural dynamics or remain on the surface. He also emphasizes the role that self-awareness plays when it comes to the self-definition of the group and the island community, and the extent to which this can represent a unit of analysis. This approach leads him to defend the concept of *cultural islands* or *artificial islands* as entities built upon the intervention of human agency and people's social and identity dynamics.

Along a similar line of defining the communities more than the spaces they inhabit, but similarly branching off from one of Eriksen's approaches, we can find Rainbird (2007). Following Cohen (1985), he insists that the limits of a community cannot be defined by geographic variables; instead, they are defined by symbolic links derived from shared experience (related to common ancestry, a shared language, common identity, shared practices, etc.). From this point of view, and incorporating some of Delanty's perspectives (Delanty 2003, 189), Rainbird understands the unit of analysis to be an entity made up of a network of interrelationships: *communities of communication* that create an imagined and constructed identity more than a symbolic reality based on fixed points of reference (Rainbird 2007, 166). The ideas underlying all this conceptual architecture, which stems from the sociology of Bourdieu, make

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use of the concepts of *habitus* and *field*, i.e. interiorized structured and structuring practices over time (Bourdieu 1994). Both dynamics act as glue, creating spaces and common references, both imagined and real, and which are recognized as specific to members of the community.

(Key Idea 5) Integrative strategies: islands beyond the physical borders: from islandscapes to aquapelagos

The beginning of the twenty-first century saw a certain shift in the paradigm of defining the unit of analysis. Of note is one work by Broodbank (2000), in which the concept of the islandscape is proposed, and another by Hayward (2012), which addresses the idea of the aquapelago. With both concepts, they include many interconnected aspects, those that are historical, cultural, geographic, identity-related, etc., but all of which largely capture traditions seen in the postulates of landscape archaeology and the concept of the various dimensions of place: as a physical space, as a used space, and as a space that is perceived, felt and remembered (Tilley 1999, 177).

We would like to highlight some points that have been derived from these concepts and which we feel have led to a paradigm shift. To do this we consider Broodbank's arguments (2000, 17), some of which can be traced back to previous works (see, for example, Helms 1988; Irwin 1992; Kirch 1984; Patton 1991; 1996; Stoddart *et al.* 1993; or Terrell 1977, among others).

a. First, in the definition of the unit of study, we must include the concepts of agency and habitus in the communities that use and perceive this unit.
b. Secondly, the definition of the unit is contextual and depends on history, thus, it can vary from one period to another and from one community to another.
c. Thirdly, the definition of islands and islanders is often affected by the communities of practice created by inhabitants. This shows us that islands, as units of analysis, need not be considered unique, and the island may not even be the defining element upon which islanders build their worlds.

Broodbank breaks away from the idea that islands are fragments of land enclosed by a coastline, instead incorporating more fluid limits that extend to how landscapes and seascapes were used and perceived by island communities. Along this same line is the concept of the *aquapelago* (Dawson 2012; Hayward 2012), which is related to the conceptual overhaul that took place in maritime archaeology at the beginning of the twenty-first century. If the concept of the *islandscape* touches on the need to break the biogeographic boundaries of islands, integrating landscapes and seascapes into one unit of study, and at the same time including the practices and perceptions of islanders, then the concept of the *aquapelago* adds a new focus, one in which mobility and connectivity become key elements when it comes to coherently articulating a unit of analysis. Following Stratford *et al*. (2011, 122), this concept stems from the idea that archipelagos, as wholes, might represent valid units of study on two possible bases: first, that they have cultural processes and connectivity dynamics that extend beyond biogeographic variables, and secondly, that this connectivity might confer identity constructs to the representative archipelago, which would reinforce its use as a unit of analysis (Hayward 2012; Knapp 2008).

With this new way of understanding the unit of analysis, there are three factors that become essential: the fusion of landscapes and seascapes, the connectivity that exists and the practices that communities carry out in these spaces, and finally, the construction of an identity that takes these considerations into account. There is also a special emphasis on the fact that histories and places are unique: notably, *aquapelagos* and *islandscapes* are built upon three pillars, one spatial, one temporal and one social: the place lived, perceived and imagined.

From this perspective, and in line with Bourdieu, units of study would be structured upon history, and also fully able to provide a structuring of historical dynamics (Bourdieu 1994). They should therefore be considered both object and subject (Cosgrove 1994, 17).

(Key Idea 6) Conceptualizing the analytical unit as a set of interactions between agents

The final key idea that has been used in island archaeology to define the unit of analysis stems from the idea that the unit can be structured around the set of interactions that have been established between components or agents that participate in the phenomenon under consideration. In archaeology, various theoretical and conceptual frameworks have been formed using this key idea, for example, systems theory (Clarke 1968), actor-network-theory (Latour 2009), and the concepts of meshwork (Ingold 2011), entanglement (Hodder 2012) and

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assemblage theory (De Landa 2006; Harris 2014; 2018). However, in island archaeology, the clearly predominant focus has been on applying different versions of world-systems theory (WST), world-systems analysis (WSA), or social network theory.

In its most basic form, this strategy aims to analyse, describe and make inferences from the relational properties of the entities that make up a network at an individual level, as well as on the level of sets, and with regard to the dynamics of entire networks (Knappett 2013). Under this approach, a relational focus and the use of *relational thinking* (Dawson 2021; Munson 2019; Terrell 2020) not only become the strategies that define the unit of analysis, but they also become the center of attention, moving away from other approaches for structuring reality, such as categorization (Dawson 2021, 6).

Our aim is not to provide an in-depth analysis of the interpretive models based on Wallerstein's (1974) world-systems theory or its reformulated counterpart, world-systems analysis (WSA), which highlights mutual influences across all connectivity nodes (Hall *et al.* 2011). Within this interpretive framework, the definition of the islands unit of analysis for islands does not reside in the islands' biogeographic or cultural characteristics, but rather in the role that the islands play in the connectivity system. In studies on prehistory, we can see approaches that take these perspectives (e.g. Harding 2013; Kohl 2011; Kristiansen 1998; Sherratt 1993; Sherratt & Sherratt 1998; etc.).

In turn, criticism of the mobility and connectivity that this theoretical framework proposes can be found in the work of authors who have minimized the impact of these long-distance contact networks but emphasized the day-to-day contact between communities (e.g. Blake 2008; Knapp *et al.* 2021; Russell 2017; Russell & Knapp 2017; Snodgrass 1991).

Analyses using social network theory in island archaeology have also become popular, and they are often used as tools to highlight the connectivity between island communities and the role that this connectivity has played in their historical and social dynamics. According to Terrell (2013, 19) network analysis applied to island environments can be traced back to 1977, when the anthropologist Hage, along with the mathematician Harary, applied graph theory to patterns in the social world of the Pacific islands (Hage 1977; 1979; Hage & Harary 1981; 1983; 1986). From that point onwards, this analytical strategy has been used in many island contexts (for a synopsis of the main lines of study and thought, see Dawson 2021; Knappett 2013; Leidwanger & Knappett 2018; or Terrell 2013).

The key concept behind these studies is that the unit of analysis is defined by the set of interactions that exist between the nodes. And there are many criteria upon which graphs can be built: nearest neighbour, common elements, a certain distance, gravity models, asymmetries, centrality analyses, visibility, etc. It is under this paradigm of relational thinking, of interaction between nodes and analysing contact topologies, that units of analysis are defined.

Discussion. Units of analysis: concepts and theoretical frameworks

We carry out our discussion on this case study on three different levels. The first is the epistemological level, where we see how the unit of analysis changes as theoretical foundations shift. The second is a more ontological level, something between a categorized view of reality and a more relational view. On the third level, we reflect on the creation and meaning of the unit of analysis in the process of interpretation.

An epistemological point of view

The range of focuses that have been taken and the multitude of intermediate situations and hybrid approaches that exist might seem overwhelming or give the impression that there is a certain lack of specificity and agreement among researchers. In order to address this 'apparent blur' (Dawson 2014, 261), we consider the epistemological foundations of the different strategies that have taken shape. An analysis of the importance that each of the analysed paradigms gives to the main concepts used can be seen in Figure 1.

Broadly speaking, we can define three distinct strategies: first, those that define units of analysis using their outer limits, their borders; secondly, those that make the definition based on the internal dynamics that take place within the units of study; and thirdly, strategies that focus on defining the analytical unit as a set of interactions between agents.

In the first group of strategies, there are two main lines of thought, each stemming from radically different ontological and epistemological sides. On the one hand, there are those that define the unit of analysis based on certain biogeographic and ecological criteria; and on the other, there are those that, in defining outer limits, use strategies related to the concept of culture.

The delimitation of the unit of study based on a defined biogeographic and ecological space inhabited by human communities stems from the idea that such a space directly conditions the set of social dynamics and practices documented, hence its

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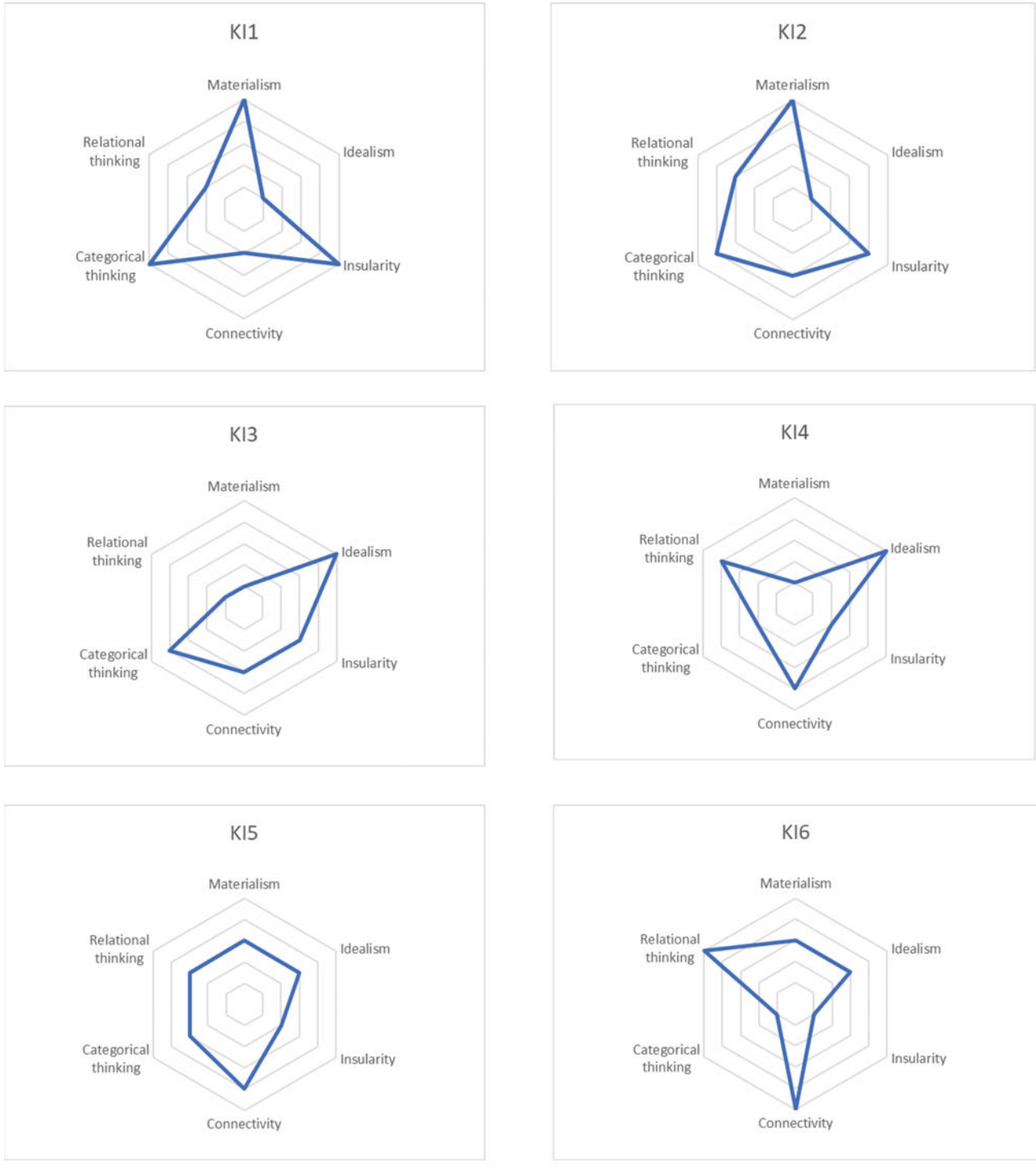

KI1: Key Idea 1: Biogeographic criteria to define the unit of analysis
KI2: Key Idea 2: Ecological criteria to define the unit of analysis
KI3: Key Idea 3: Cultural criteria to define the unit of analysis
KI4: Key Idea 4: Sharing identities and praxis to define the unit of analysis
KI5: Key Idea 5: Sharing a place (sea and land) where the multiple interconnections are functioning
KI6: Key Idea 6: Set of interactions as a unit of analysis

Figure 1. *Radial graphic projection of the concepts related to each Key Idea.*

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interpretive and unifying potential. This strategy is probably the one that has been most used, because of the clarity in its application and the ease with which it can generate widely applicable models. Unlike continental land masses, in island archaeology the units of analysis defined by their biogeographic borders are clearly distinguished by the island/sea dichotomy. The strength of this key idea stems from two aspects: first, the importance that it gives to the concept of insularity/isolation compared to that of connection, as well as the role that both have played in social arenas. Then, as biogeographic, weather-related, nautical and historical-cultural conditioners lead to low levels of connectivity, the island as a unit of analysis becomes more robust, as opposed to when these factors favour connectivity dynamics (Anderson 2018; Dawson 2014; Fitzpatrick & Anderson 2008; Leppard *et al.* 2022).

It might also be the case that communities that coexist on an island are actually less connected to each other than they are to communities on other islands or land masses; this was the case in Mallorca during the second Iron Age (Hernández-Gasch & Quintana 2013) or Corsica and Sardinia after the expansion of the dolmen-building phenomena during the Late Neolithic (Cicilloni 2007; Leandri 2023). These examples allow us to see how robustness and the island unit of analysis are directly linked, not because of the biogeographic conditions that exist (though they undoubtedly play a significant role), but because of the isolation/connectivity dynamics that exist at each moment in history in human island communities.

Secondly, the relative sensitivity that islands have to disturbances. Islands have their own geographic and ecological realities, which are highly structuring and very sensitive to the arrival of human beings and the species that they bring along with them. Therefore, many researchers have taken a historical-ecological point of view when analysing human impacts on island ecosystems; among them, the island unit, as a systematic model, offers a robust option for interpretation (e.g. Fitzpatrick & Erlandson 2018; Leppard & Pilaar Birch 2016; Rick *et al.* 2013; Siegel 2018; etc.).

The approach involving biogeographic and ecological variables takes a materialistic perspective, one in which reality is seen as something independent from the cognisant subject, and thus, is measurable and objectifiable (see Figure 3, below). Under this strategy, data are understood to be neutral, objective and independent of the interpretive process. This strategy is placed in the realm of radical realism at ontological, epistemological, and semantic levels, in that there is an independent reality that can be accessed and proposed theories reflect this reality. The implementation of this strategy in island archaeology cannot be separated from the enormous influence that new archaeology and ecological approaches have had on archaeology since the 1960s. With them —and in line with the postulates of logical positivism (Hempel 1942; 1965)—there was a clear desire to be more scientific and more objective, and to come up with models that could be widely implemented. On the other hand, while ecological perspectives (e.g. the second key idea) take a materialistic, positivist position, they move away from this radical realism towards a more structural realism: a reality independent of the cognisant subject, one that is accessible, but more on the level of the structures laying out reality.

In general, this approach has four major shortcomings. First, it is difficult to incorporate processes and dynamics that take place outside the geographically defined unit of study. When defined borders do not include, and indeed are surpassed by, the practices of island communities, which on a day-to-day basis transcend the proposed geographic framework, the originally conceived unit loses coherence, and the ability we have to make inferences is weakened. Secondly, there is a danger of creating a circular discourse by which the defined unit of analysis itself explains the dynamics that take place therein. Thirdly, the concepts behind biogeographic variables have sometimes been used without proper historical contextualization, but this does not preclude the historical timeline from being tied to historical ecology or the model systems derived from ecology. Fourthly, a critical, deconstructive analysis of this strategy makes clear that there is a projection of Western values and ways of thinking, with lines of thought such as effort/result/profit, objective/function, etc., which are often not found in the communities being analyzed.

From a totally different point of view, but with the aim of defining a unit of study based on its external limits, we find strategies that opt to define the unit of study in relation to the human communities themselves, as they can be considered to be, in reality, variables with greater interpretive power (see Figure 2). This means breaking away from biogeographic delimitations and boundaries to establish new criteria that adapt to the cultural dynamics observed. Contrary to the previous approaches, this set of strategies stems from a more idealistic point of view, as culture is seen to be an ideal structure, made up of the set of items that are considered to

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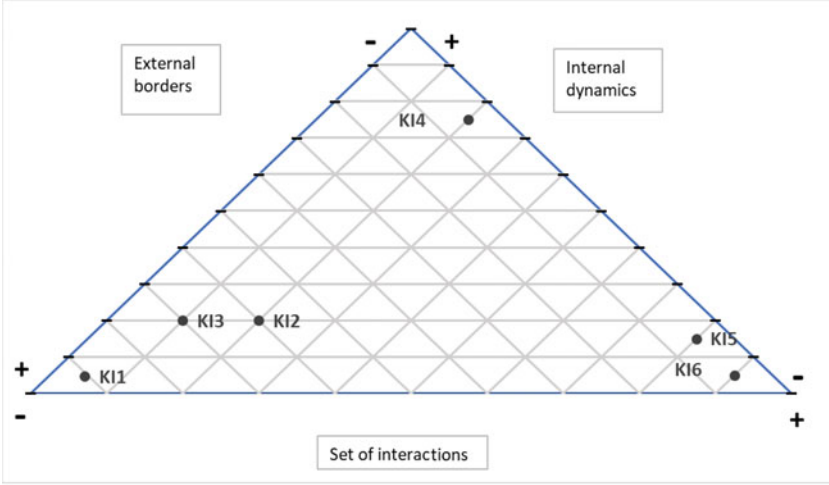

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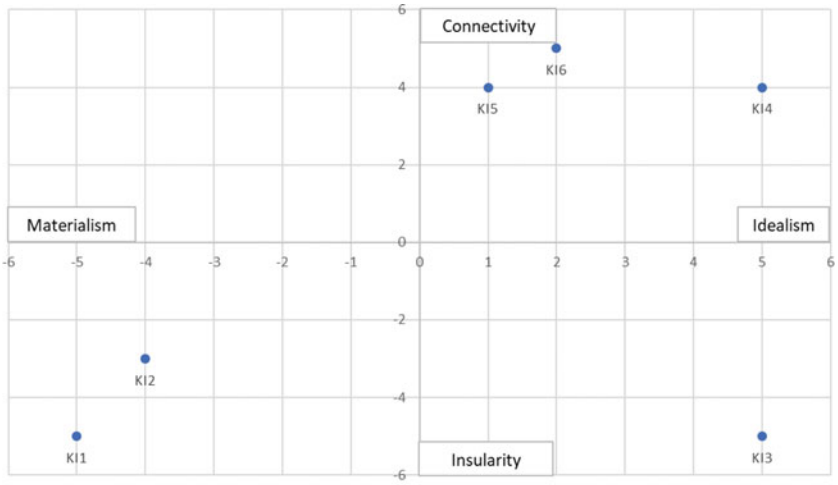
Figure 2. *Comparative projection of the key concepts in regard to their study unit definition strategy.*

define it (see Figure 3). From this more idealistic point of view, variables related to the organization of reality are defined at an instrumental rather than structural level. Originally, this strategy was associated with the paradigms that were taking shape at the end of the nineteenth and beginning of the twentieth centuries, both in human geography and anthropology, with notable figures including Ratzel, Boas, Schmidt, Smith, etc. From these disciplines, regional differentiation in material, moral and mental culture began to be studied and these differences began to be explained in terms of cultural diffusion and cultural circles or areas.

It is Tylor (1871) who gives the concept of culture its classic definition: a network that includes the knowledge, beliefs, art, morals, laws, customs



KI1: Key Idea 1: Biogeographic criteria to define the unit of analysis
KI2: Key Idea 2: Ecological criteria to define the unit of analysis
KI3: Key Idea 3: Cultural criteria to define the unit of analysis
KI4: Key Idea 4: Sharing identities and praxis to define the unit of analysis
KI5: Key Idea 5: Sharing a place (sea and land) where the multiple interconnections are functioning
KI6: Key Idea 6: Set of interactions as a unit of analysis

Figure 3. *Comparative projection of the key concepts in reference to two axes that enable their classification following four concepts: Insularity/Connectivity, Materialism/Idealism.*

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and other abilities and habits acquired by human beings as members of a society. Nevertheless, regarding its application in island archaeology, the most similar points of reference can be found in Boas, for whom the concept of culture is formed from a particular historical point of view and is understood to be the sum of that which is formal (similar objects) and that which is essential (shared habits) to a culture (Stocking 1966).

The main difficulty with using the concept of culture as the line for defining the unit of analysis has two parts. On the one hand, we have to define what is meant by culture, a difficult undertaking, especially when it comes to analysing the weight of each variable included in its definition. A clear example of this is the amount of scientific literature that has been created regarding this very concept, and a consensus has yet to be reached (e.g. Geertz 1973; Giner 2010; Kroeber & Kluckhohn 1952; Lévi-Strauss 1958; Malinowski [1944] 1960; etc). On the other hand, culture-related variables that can be used to draw cultural borders between communities must be defined. Neither of these two cases has an easy solution, as Barth (1969) reflected, hence the number of paths taken when establishing the limits of the unit of analysis: from identifying common traits that could be defined as a culture (cultural material, language communities, connectivity, etc.) to the development of identity strategies like recognizing and belonging to a group (accepting a common ancestry, self-recognition as belonging to a group, symbolic strategies and shared practices, etc.).

In contrast to these two major concepts for defining the unit of study by its outward-facing limits are strategies that focus on the internal dynamics of the units of analysis to define the units themselves (see Figure 2). Of note in this group are strategies that focus on identifying the practices and habitus shared between human communities that end up creating identity dynamics and self-referencing. Along this line, for example, are the idealistic approaches (Eriksen 1993; Hau'ofa 1993; Rainbird 2007) related in some measure to traditional post-modern approaches stemming mainly from sociology and anthropology. With Eriksen, the units of analysis are defined by a *continuum of communication* between groups (Eriksen 1993, 134), partially following the approaches taken by Giddens (1990) and Appadurai (1990). For his part, Rainbird—using Bourdieu-like concepts that centre on the discussion over idealistic *versus* materialistic approaches—incorporates continual, structured, and structuring relationships between certain human groups, which give way to the shared habitus and identity recognition that serve as lines for defining the units of analysis (Rainbird 2007). This set of strategies breaks away from the idea of units of analysis with clearly defined limits, accepting as something inherent to the unit the presence of liquid borders, fluidity and intrinsic variability.

Another set of strategies that also defines the unit of analysis using dynamics created from within comes from a different starting point: one in which the concept of place as a physical space that is used, socially constructed, perceived, symbolic, has a lasting memory, and is dependent on each specific culture and era becomes the conceptual tool used to define the unit of analysis. These strategies are related to changes in landscape archaeology at the end of the twentieth century and the related influence that was played by some post-structuralist approaches, which changed the way of understanding territory and marked the evolution toward a more holistic concept of landscape (Ingold 1993; Thomas 1993; Tilley 1994; 1999). Some authors, such as Bender (1993), Gosden and Head (1994), or Tilley (1994) are direct points of reference for this movement in island archaeology (e.g. Broodbank 2000).

From these premises, and using the concepts of the *islandscape* and the *aquapelago*, we can try to establish the unit of analysis; variables that should be considered include the following: the idea of fluidity between the land and sea, and that they represent one specific unit of coexistence; an emphasis on the connectivity and mobility of groups and a focus on their shared practices; and finally, a certain level of identity, one that can be constructed from the islandscape and the communities that experience it (see Figure 3).

There is one final strategy that can be found among those taken when defining the unit of analysis, the ones that focus on defining it as a set of interactions between agents (see Figure 2). This approach stems from relational thinking, a theoretical paradigm (see Figure 4) in which two foundations describe the units of analysis: first, accepting that relationships are more important than the agents themselves, this includes physical spaces and identities, thus differing from approaches that structure reality on categorization to capture relationships as the main structurer of reality (Dawson 2021); and second, renouncing the idea that it is possible to get only one unique unit of study to include the set of phenomena that shape a historical context. The present method aims to fragment this historical context into different dynamics and phenomena, and for each of these fragments, a unit of analysis is defined

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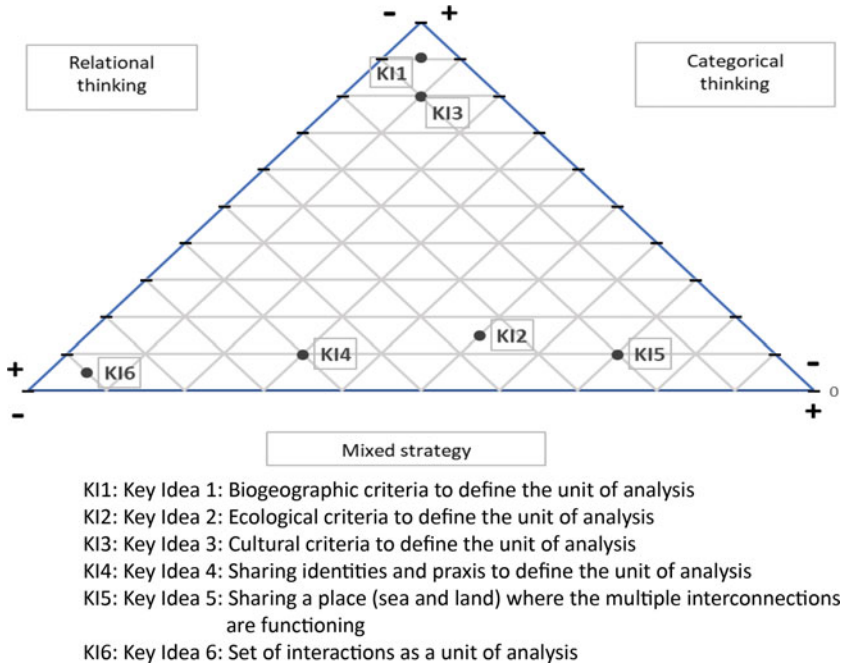

Figure 4. *Comparative projection of the key concepts on the ontological level.*

by the connections between the agents involved. In this way, a historical context is the sum of and interaction between multiple levels of connections grouped into multiple units of analysis, each of which are converted into decidedly contingent networks or assemblages. This fragmentation of the unit of analysis breaks away from the tradition in island archaeology of finding an all-inclusive, unique object of study. Instead, this approach is more attuned to the diversity observed, and it aims to provide an in-depth analysis of the observed complexity by splitting it up and trying to see its many levels of interrelationships.

From an ontological point of view

From this point of view, one group is made up of key ideas that can be expressed using categorical thinking (see Figure 4), where the definition of the variables (as well as the explanatory models and comparison strategies) becomes the main focus, so as to overcome the particularities of each case and hopefully achieve a more comprehensive historical analysis and discussion. In this group we find the first, as well as some instances of the third key idea.

The main critique of this model has to do with its own ambition. 'To what extent are we able to condense reality into a limited set of categories? To what extent are these simplified models of reality useful in understanding the dynamics of human communities?' (Terrell 2020, 8). And these issues do not take into account a critical, deconstructive analysis of the variables used, which would lead us to see how, in selecting them, we often include openly Western ways of categorizing and understanding the dynamics of human communities which often differ greatly from the domineering Western worldview.

Another group is made up of the key ideas that emphasize the use of relational thinking (see Figure 4). These ideas, in their attempt to categorize it, aim to analyse reality from the multiple interactions that occur. These strategies take a much more dynamic and fluid point of view, which allows them to integrate variability and difference more harmoniously. On the other hand, they have a harder time comparing and integrating different relational fields and comparing different networks and sets of interactions. In many cases, to develop relational thinking in this context, the response has been to include categorical thinking as a strategy for comparing networks of interaction. With this more relational strategy we find some studies related to the fourth key idea and all of those adhering to the sixth key idea.

The last group is more mixed. Using concepts such as islandscapes or aquapelagos, and in certain ecological models, categorical variables are included to analyse biogeographic and ecological aspects; relational thinking takes on greater significance when it comes to analysing historical dynamics and, most notably, the set of interactions that take place in the biogeographic spaces under consideration. In this

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final group we find studies that are associated with the fifth key idea and some approaches with the second.

Rethinking the unit of analysis

As we have seen, in a discipline like island archaeology where the unit of analysis is seemingly obvious, a wide range of focuses and perspectives have been and are currently being taken. It is therefore interesting to reflect upon the process of creating the unit of analysis. At first, when laying out the issue under consideration, an initial hypothetical unit of analysis is created, conceived from the theoretical premises that stem from and respond to the following question: what do I want to analyse and how am I going to do it? This first hypothetical unit of analysis, as well as the chosen reference variables, will condition the rest of the analytical process and the results obtained, as the initial definition of the field and the rules for analysing it lead to a certain reconfiguration of the reality of the object under consideration. Originally, multiple superpositions and levels of interaction existed in this reality, but in defining the field and an analytical strategy, this reality takes shape in a certain way. Throughout the study process, both the unit of analysis and the variables will be adjusted in order to achieve the most robust construction possible. This will lead to the definition of both the unit of analysis and the variables that have showed the greatest interpretive robustness with regard to the theoretical framework of reference being used. Throughout this process, we must consider the structuring nature that the chosen variables have on observed reality, as their interpretation cannot go beyond the fields of interaction that they create. To this end, new variables would have to be introduced to redefine the field of interaction and thus the unit of analysis. During this interpretive process we find agents (objects of study, units of study, variables and methods of analysis, observers, researchers, etc.) that do not act as outside, neutral, or passive elements. Instead, they take on structured and structuring dynamics *à la* Bourdieu, given that they materialize jointly as the process of analysis and interpretation moves forward.

From here, the unit of analysis takes shape not as something independent, objective, measurable, or constant, nor as a set of associated mental structures, but rather as a field of interaction of the dynamics created by the variables selected. Ontologically and epistemologically speaking, this allows us to structure the phenomenon we wish to analyse, not based on the object of study itself, but based on the analytical strategy being used. Seen in this way, the unit of analysis, from its first potential postulations to its final form, becomes a centrepiece, and thus it conditions and structures the overall interpretive process as well as reality itself. Because of this, the unit of analysis is influenced by the historical context about which the work is written, the theoretical framework proposed, and the topic or period upon which the researcher has been working. This means, to a certain extent, a loose application of some of the offshoots of Heisenberg's uncertainty principle or Bohr's complementarity principle; i.e. a multiple, overlapping reality only takes shape when it is observed (Hilgevoord & Uffink 2016; Madera Gómez 2016). For this reason, when choosing a unit of analysis, a certain deconstructive process is required in order to be aware of what the repercussions are of choosing certain variables—as well as the unit of analysis—throughout the interpretive process and the effect they have on the results obtained.

Conclusion

One of the great challenges in archaeology, when it comes to analysing islands and island communities, is delineating what should make up the unit of study. This delineation is not in the least bit simple, as it must consider the multiple connections and relationships that exist within human groups and between other groups and the places they inhabit. This wide range of connections, along with their contingent, multiple, relational, and simultaneous nature, must be smoothly incorporated into the definition of the borders of what can be considered a valid unit of study. Accordingly, this has allowed for a variety of strategies and focuses to be taken, which has given this tool great theoretical richness and conceptual variety. This vibrancy should be understood in two ways: in some ways, it owes itself to the major theoretical-conceptual trends in archaeology, anthropology, and sociology, while in other ways island archaeology has been an innovative pioneer, with its ecological approaches and the advancement of concepts such as isolation, mobility, connectivity and relationships.

Beyond these interactions with other disciplines, however, a critical historiographical analysis of the concept of the unit of analysis has a second aspect. The definition of the unit of study is structured around and defined by the objectives we set out and the theoretical and methodological frameworks that we use. Thus, we should not consider the unit of analysis to be an independent, *ex-ante* element, but rather something that comes from the interpretive process. This means accepting the existence of

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multiple, not mutually exclusive, units of analysis that offer different points of view of an overlapping, interrelated, multi-faceted reality. Despite the fact that this could lead to significant conceptual and epistemological offshoots with regard to certain definitions of a realistic view of the scientific practice (on every level: ontological, epistemological, semantic, structural, etc.), at a practical level, it leads to two consequences: on the one hand, the existence of a multivocality inherent in the interpretations of the behaviours of human societies on islands, and on the other, the incorporation of a certain theoretical fluidity that allows for the coexistence—sometimes with considerable theoretical tension—of such multivocality.

Ultimately, the acceptance of this perspective and the role that the unit of analysis plays allow us to reduce the question for defining the unit of analysis to one basic question: 'How relevant is it?' (Terrell 2020, 8). How relevant is the chosen unit of analysis to the problem that we wish to analyse? And on a secondary level, how can we coherently aggregate the multiple possible units of analysis?

While it is not the objective of the present study, accepting the suggested premises allows us to pose some points of consideration. First, it means accepting that the unit of analysis is the interaction field that is created when the chosen variables are used, not a reality that is independent, objective, or previous to the process of analysis. Secondly, it means that we need to analyse critically the variables used so that we are aware of how they condition our perception of reality. This means accepting the fact that certain phenomena will evade the field of interaction created by the chosen variables. Thirdly, it requires that we analyse the limits of the interaction between the chosen variables when facing situations that cannot be measured by the same standard as the field of analysis that is created. Fourthly, and finally, in a more epistemological sense, it enables us to develop conceptual tools that enable us to integrate more coherently various fields of interaction or units of analysis that stem from epistemologically different variables.

Returning to the case study on island archaeology, we can see how some concepts and strategies can be related to this final point, i.e. concepts and ideas derived from ecological and historical-ecological perspectives as well as holistic concepts—such as islandscapes, aquapelagos, communities of communication and communities of practices—aim to group together various fields of interaction. We do not wish to overextend, as this is not the objective of the current study, but we understand that the application of these (and other similar) concepts, from an ontological point of view, promotes a much more relational view of reality than one structured around classifications and categories.

In developing these relational frameworks for defining units of analysis, we feel that there are two key aspects. On the one hand, there is the idea that the nodes, agents, actors, etc.[2] that interact, have multiple overlapping realities that are only activated, and thus are only observable, when a certain interaction takes place involving the variables chosen. On the other hand, the interactions themselves, which are continuous, changing, relational, fluid, and contingent, can be structured differently, and therefore, they may create structural dynamics throughout the field of interaction. These structural conditioners limit and condition both possible future lines of interaction and the overlapping realities of the agents that might be involved.

Acknowledgements

I would like sincerely to thank H. Dawson, D. Javaloyas, D. Albero, J. Garcia and A. Galmés for having read the present text and for their enlightening comments and assessments. I would also like sincerely to thank the editor and reviewers; their comments have helped to improve the article considerably. Obviously, any errors are the sole responsibility of the author.

This study was supported by the following R&D project: 'Movilidad y conectividad de las comunidades prehistóricas en el Mediterráneo occidental durante la prehistoria reciente: El caso de las Islas Baleares' (PID2019-108692 GB-I00), which is financed by the Spanish government's Ministry of Science, Innovation and Universities MCIN/ AEI /10.13039/501100011033.

Notes

1. The definition of these six key ideas derives from the seminal works by the authors that originally came up with them. In the interest of being concise we do not carry out an historiographical analysis of their evolution, although related bibliographic references are included.
2. The vocabulary depends on the theoretical framework being used: actor-network-theory (Latour 2009), meshwork (Ingold 2011), entanglement (Hodder 2012), or assemblage theory (De Landa 2006; Harris 2014; 2018).

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https://doi.org/10.1017/S0959774323000501 Published online by Cambridge University Press

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https://doi.org/10.1017/S0959774323000501 Published online by Cambridge University Press