Autonomous but not isolated

Citation for published version:

Digital Object Identifier (DOI):
10.1111/arcm.12695

Link:
Link to publication record in Edinburgh Research Explorer

Document Version:
Publisher's PDF, also known as Version of record

Published In:
Archaeometry

General rights
Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy
The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact openaccess@ed.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.
Autonomous but not isolated: A petrographic study of Iron Age ceramics from a ‘deep-rural’ community in Asturias (NW Iberia)

Beatrijs G. de Groot1 | David González-Álvarez2

1School of History, Classics and Archaeology, The University of Edinburgh School of History Classics and Archaeology, UK
2Spanish National Research Council (CSIC), CSIC, Institute of Heritage Sciences (Incipit), Spain

Correspondence
Beatrijs G. de Groot, The University of Edinburgh School of History Classics and Archaeology, School of History, Classics and Archaeology UK.
Email: beatrijs.de.groot@ed.ac.uk

Funding information
Spanish Ministry of Science and Innovation, Grant/Award Number: HAR2013-47889-C3-3-P; Leverhulme Trust, Grant/Award Number: ECF2019-081

INTRODUCTION

During the first millennium BCE, communities in the north-western part of the Iberian Peninsula inhabited hilltop sites, locally known as castros (=hillforts) (Parcero-Oubiña et al., 2017). These sites were fortified with large defensive systems including stone walls and ditches. Despite shared modes of habitation, the area is marked by internal regional diversity, evidenced by differences in portable material culture and degrees of hierarchisation (González-Ruíbal, 2012). In the mountainous regions of northern Iberia, stretching between the interior of Galicia and western Asturias, Late Iron Age (400–19 BCE) groups have been characterised as ‘deep-rural’ communities (Marín Suárez, 2011), considering anthropological analogies established by Alfredo González-Ruíbal (2012) based on Jdrej’s (1995) research, and general views on Iron Age societies under the umbrella of...
'heterarchical societies' (Moore & González-Álvarez, 2021). Looking at the archaeological record, deep-rural communities inhabiting local hillforts have been described as self-sufficient, egalitarian groups, characterised by their isolation and conservative forms of material culture and by lacking prestige objects and monumental architecture (González-Ruibal, 2012, 259). Like other classes of material culture, ceramics have been considered as products of domestic labour (Marín Suárez, 2011). This interpretation fits with the dominant narrative of the 'deep rural' model, in which portable material culture is produced within the household to achieve autonomy and self-sufficiency. However, there are many gaps in our understanding of Iron Age ceramic technology and the organisation of ceramic production due to a lack of comprehensive studies utilising material scientific approaches. Archaeometric studies have been conducted in NW Iberia looking at gold (e.g. Armada & García-Vuelta, 2015) or metal objects (e.g. Farcì et al., 2017), but pottery is still underinvestigated for this region.

The present study provides a new contribution to a growing body of archaeometric research on Iron Age ceramics in other areas of the Iberian Peninsula (López de Heredia et al., 2018), aiming to reassess traditional assumptions concerning the organisation of ceramic production in Iron Age rural societies in this part of Iberia. Ceramic petrographic research was carried out on Late Iron Age ceramics from El Castru in Vigaña (Asturias, NW Spain, Figure 1), a hillfort that, by all common standards, classifies as a deep-rural site. The present study provides evidence for the mineralogical composition and microstructure of ceramic fabrics at El Castru and investigates the provenance of raw materials for ceramic production through geological survey and the petrographic analysis of local clays. We utilise this information to trace the development of the initial technological steps in the ceramic production process – that is, the procurement and preparation of clay – next to information concerning firing temperatures and shaping methods. Our results suggest that El Castru's Late Iron Age ceramics were produced from non-local clays opposing current views on the organisation of ceramic production. Our research demonstrates the importance of archaeometric studies for assessing theoretical interpretations about the social complexity of Iron Age societies in the region.

**ARCHAEOLOGICAL CONTEXT**

El Castru is a small hillfort near to the village of Vigaña, in the municipality of Balmonte de Miranda (Asturias, Spain). This site is a good example for the small hillforts (less than 1 ha.), which are common in the mountainous landscapes of western and central areas in Asturias and the north-western area of León (González-Ruibal, 2006, 2006-2007; Marín Suárez, 2011; Villa Valdés, 2007b) (Figure 2). The site was excavated in 2012 and 2013 within the context of a diachronic landscape archaeology project, which produced valuable information from several chronological periods, since the Neolithic to the contemporary era (Fernández Mier et al., 2018; Fernández Mier & González-Álvarez, 2013). The aim of the excavations at this site was to provide evidence for the chronology and evolution of its occupation, aiming to incorporate those results into long-term biographies of upland landscapes in the region (González-Álvarez, 2016, 2019).

The investigations at El Castru were developed in two different areas. An exploratory trench was excavated out of the fortified perimeter of the hillfort, revealing contemporary agrarian activities that modified the topography of the site quite noticeably, as well as a deposit of dark soil with animal bones, which was interpreted as a rubbish dump. The main excavation area was located in the upper area of the settlement, revealing a stratigraphic sequence with six different phases corresponding with successive occupations and different uses in the areas explored (González-Álvarez et al., 2018). The earliest evidence dates to the Early Iron Age, with the
remains of a structure inside the walls (phase 1), followed by phase 2, relating to the transition between Early and Late Iron Age. Phase 3 corresponds with a small complex for metallurgic activities, radiocarbon dated between the fourth and second centuries cal BCE (González-Alvarez et al., 2018, 220–223). Phases 4 and 5 relate to stone roundhouses, which were built during Late Iron Age and probably abandoned soon after the expansion of the Roman state early in the first century AD. Phase 6 corresponds to the most recent layers in the sequence, which have been altered by modern agricultural activity.

A total of 295 ceramic fragments was recovered from the excavations in the main trench in El Castru. No pottery was found in phases 1–2. Phases 3 to 5, related to the pre-Roman occupation of the hillfort, contain handmade ceramics. Roman pottery, produced using a fast potter’s wheel, appears in phase 5; these include red-oxidised wares, grey-ware and terra sigillata. Phase 6 includes a mixture of previous types of pottery alongside modern and contemporary ceramics.
El Castru is located 563 m above sea-level on a limestone ridge of the Moniello formation, nearby ferruginous limestone and slate formations (Figure 3). The landscape is characterised by mountainous terrain with steep slopes and densely forested valleys. The Pigüeña River, located 240 m below the site to the east, flows into the Narcea River, which gives access to Cantabrian Sea to the North.

Some 3 km East of the site is a major NE–SW running fault line located at the western-most extent of the Cantabrian Zone, which consists of Paleozoic unmetamorphosed and carboniferous rocks. The fault line, known as the Narcea River Gold Belt (Cepedal et al., 2000; Martin-Izard et al., 2000), extends for nearly 45 km across western Asturias and comprises several gold mineralisations that have been mined since at least the Roman period (Villa Valdés, 2007a, 2010). The nearest gold mineralisations to El Castru (which derive from skarn deposits) are intrusions that are associated with igneous rock (predominantly monzogranite) with subhedral phenocrysts of plagioclase and quartz (Martin-Izard et al., 2000). These igneous rock intrusions are surrounded by carbonate, slate, ferruginous sandstone, and quartzite geology.
The impact of gold mining on the landscape of NW Iberia has been significant (López-Merino et al., 2014). In the 200 years of Roman domination, some 75 million cubic rocks from over 200 open pits in western Asturias, León, and Galicia have been removed (Spiering et al., 2000, 91). Roman mining activities included the creation of channelling networks across

FIGURE 3  Simplified geology and location of geological samples taken in granite areas and in the surroundings of El Castru in Vigaña (5 and 6)

The impact of gold mining on the landscape of NW Iberia has been significant (López-Merino et al., 2014). In the 200 years of Roman domination, some 75 million cubic rocks from over 200 open pits in western Asturias, León, and Galicia have been removed (Spiering et al., 2000, 91). Roman mining activities included the creation of channelling networks across
open ore deposits to extract gold ores through hydraulic force (López-Merino et al., 2014, 214). Such channels are visible on the slopes of the mountain ranges 7 km NW of El Castru. Contemporary mining at El Valle-Boinás has eradicated most of a 1 km wide stretch of mountain in the Begega countryside 3 km West El Castru.

LATE IRON AGE CERAMICS IN NW IBERIA

Late Iron Age (400–19 BCE) ceramics in NW Iberian are characterised by their regional variation, based on subtle typological differences (e.g. Fernández Fernández, 2008; González-Ruibal, 2006; 2006-2007; Rey Castiñeira, 1990). Particularly valuable for us, Marín Suárez has produced a detailed account of Late Iron Age pottery for the western and central Cantabrian area, comprising present-day regions of Asturias, Cantabria, and the northern Duero basin (Marín Suárez, 2012). Although the number of excavated and published ceramic assemblages for this area is limited, it appears that the ceramics from El Castru are characteristic for the broader region, particularly the area stretching between the mountainous interior of eastern Galicia and the north-eastern Asturian coastal zone (zones 3 and 4 in Marín Suárez, 2012, Figure 4). Comparable material to the assemblage under investigation are ceramics recovered and published in detail from nearby hillforts in Asturias, such as San Chuis (Allande) (Jordá-Pardo et al., 2014; Marín Suárez, 2007), Llagú (Oviedo) (Berrocal-Rangel et al., 2002), and La Campa Torres (Gijón) (Maya González & Cuesta Toribio, 2001).

Although, in most of the Iberian Peninsula, the potter’s wheel and two-chambered updraught kiln are adopted by the middle of the first millennium BCE, such innovations do not appear in NW Iberia until the Roman conquest. Pottery from Iron Age hillforts in NW Iberia are typically produced using hand-shaping methods such as coiling and pinching, and fired in reducing atmospheres (Marín Suárez, 2012; Prieto Martínez & Cobas Fernández, 1998). Ceramics from Central Asturias and western Cantabria are characterised by S-shaped and globular bowls with straight, flaring, or carinated rims and flat bases. Some vessels in south-eastern Cantabria and Central Asturias have rims with perforations that might have served as suspension handles. On the western Cantabrian coast some vessels have larger loop-shaped handles (Marín Suárez, 2012, 185). Characteristic of the region are vessels with vertical burnishing marks running from the rim toward the shoulder and horizontal burnishing marks from the shoulder downward, and burnished or incised crosshatched decorations. Other decorations that can be found are impressions and applications (Marín Suárez, 2011, 180–186).

Considering the organisation of ceramic production, the assumption prevails that Iron Age ceramics are produced within the household (Marín Suárez, 2012). The idea of the domestic production of hand-made pottery has been used in support of theoretical models of the social structures of Iron Age societies as well as ideas about the gendered division of labour (Padilla Fernández & Dorado Alejos, 2017; Vega Maeso et al., 2021). Vega Maeso et al. (2021) consider that after the transition between the Bronze and Iron Ages, the skills and ideas regarding pottery production were transmitted vertically, along the female line, and that patterning in the similarity of ceramic styles is a relic of patrilocal intermarriage patterns that develop in northern Iberia after the influx of men from northern and central Europe at the end of the Bronze Age (Vega Maeso et al., 2021, 84, referring to Olalde et al., 2019). This theory hinges on the assumption that handmade ceramics are produced domestically and that the house was the realm of female activity (Padilla Fernández & Dorado Alejos, 2017). However, such interpretations are primarily based on ethnographic analogy, and more archaeological evidence remains required to show that this would be a widespread phenomenon.

In order to understand the organization of production (which includes the degree of specialisation, rate of production and the division of labour), it is first important to consider the location of ceramic production (Costín, 2000, 384). Given the relatively low abundance of Iron Age
ceramics in the excavated archaeological deposits of the region considered, it is imaginable that ceramics were produced within each site for local demand alone. However, without considering the location of production we cannot confirm whether castros were completely self-sufficient or whether some households produced ceramics as surplus for exchange. Despite the high level of autonomy that can be achieved in household economies, complete self-sufficiency is unlikely,

FIGURE 4 Microphotographs of thin sections (crossed polarised light, field of view 3.0 mm)
Notes: A: Granitoid fabric (1A); B: Gneiss-tempered fabric (1D); C: Granite-tempered fabric (1B); D: Misfired granitoid sub-fabric (1C); E: Calcareous clay fabric (2); F: Fine quartz (3B); G: Fine quartz (3C); H: Fine quartz (3D)
particularly in marginal environments (e.g. Hagstrum, 2001, 48). Ceramic petrographic analysis can provide important clues as to the geological source areas from which ceramic clays and/or temper derived, which can contribute to examining the location of ceramic production (Bishop et al., 1982, 285).

In order to evaluate theoretical models concerning the organisation of ceramic production and their connection to models of mobility and social interaction, the present study characterises the clay ‘recipes’ utilised in the production of Late Iron Age ceramics from El Castru and considers the relationship of ceramic raw materials to the local geology. This allows us to assess whether ceramics were produced at the site as a domestic product or if more complex systems of raw material procurement or exchange underpin the use of pottery at the site. Furthermore, by comparing ceramic fabrics to the mineralogical composition of natural deposits in the site’s environment, this study enhances our understanding of landscape exploitation in the Iron Age.

MATERIALS AND METHODS

Samples

This pilot study encompasses 40 ceramic fragments from phases 3–6 at El Castru, reflecting the typological spectrum of the Late Iron Age ceramic assemblage (Table 3, digital supplement and González-Alvarez, 2016, 342, Table 9.6). El Castrus ceramics are extremely fragmented with small body sherds representing the largest group. We therefore selected samples based on variation in surface treatment, colour, and wall-thickness, as well as sherds with pattern burnished, incised, and perforated decorations; s-shaped profiles; and sherds with straight and flaring rims. This pilot sample was selected as a first step in evaluating the variability in the compositional groupings underpinning these typological variations.

Thin-sections were prepared in the Wolfson Archaeological Science Laboratories of the UCL Institute of Archaeology and analysed at the Microscopy Laboratory of the School of History, Classics and Archaeology at the University of Edinburgh. Ceramic fabrics were recorded and separated into fabric groups based on mineralogical and structural variations utilising a description system proposed by Whitbread (1989, 1995) and modified by Quinn (2013).

Geological samples

The comparison of the mineralogical composition of ceramic fabrics with the surface geology by means of thin-section petrography can provide important evidence for the provenance of archaeological ceramics (e.g. Quinn, 2013, 117–150). Although geochemical analyses are required to provide conclusive evidence of clay provenance, our first aim was to consider the availability of ceramic raw materials in or nearby granite outcrops in our areas. Granite areas were targeted because petrographic analysis indicated that granitoid rock fragments were prevalent in most samples. The geological survey focused on an assessment of available clay sources near local granite intrusions and to take samples for petrographic comparison to the ceramic fabrics. Sample locations included a large, well-known granite area at Boal, 50 km west of El Castru, as well as the granite area at Salas, located around 15 km north of El Castru. We took one sample from Boal as a reference to compare to the nearer granite areas in Balmonte and Salas. Small granite intrusions (c. 100–300 m³ in diameter) are located at a minimum distance of 3–7 km west to north-west of El Castru within the Narcea River Gold Belt. These were identified in the field through utilising a geological cartography available open access at the Spanish
Geology and Mining Institute (from Spanish Instituto Geológico y Minero de España [www.igme.es]) and downloaded onto a handheld Garmin GPS that helped us to navigate to the points of interest in our field survey (Table 4 in the digital supplement).

Thin sections of nine geological samples were analysed, including clays from two locations at El Castru itself. The briquettes formed from the clay samples were fired in oxidising conditions at a maximum temperature of 850°C—replicating estimated firing temperatures of the ceramic samples—at the Glass Department of the Edinburgh College of Art. Thin sections were prepared at the Archaeology Laboratories of the School of History, Classics and Archaeology at Edinburgh University and analysed using a polarising light microscope. Sandy deposits from location 10 were added to clays from El Castru (locations 5 and 6) to examine the mineralogical profile of granite tempered local clay.

RESULTS

Summary of the fabrics

The ceramic samples represent main fabric groups and several internal subgroups (figure 4). The most common fabric 1 \((n = 32)\) is composed of non-calcareous clay with granitoid rock fragments. This group is further subdivided into fabrics 1A (igneous rocks, \(n = 8\)), 1B (granitoid temper, \(n = 4\)), 1C (gneiss/metamorphic rocks, \(n = 13\)), 1D (gneiss temper, \(n = 4\)), 1E (misfirings with granitoid inclusions, \(n = 3\)). A detailed description of these fabrics can be found in the digital supplement. Samples of fabric 1 are characterised by the presence of few coarse (1–2 mm) polycrystalline fragments composed of quartz, feldspar, and biotite, as well as common inclusions of these separate minerals. These polycrystalline inclusions represent granitoid geology, though some of these could be of metamorphic origin (recognised by the undulate extinction of quartz and granoblastic texture of some of the polycrystalline inclusions), such as granitoid gneiss. Fabrics 1C and 1D represent samples with such metamorphic polycrystalline inclusions, though in all other ways these samples are comparable to fabric 1A, 1B and 1E.

The presence of granitoid rocks that could either derive from an igneous or metamorphic source suggests that clays containing these inclusions derived from an area with granitoid geology. No relationship exists between the subfabrics and specific typological features or the sites chronological sequence, suggesting that these fabrics do not necessarily correspond to different technological traditions (see supplementary material), but that variation in the nature of the inclusions could derive from variation within the same clay source. Samples with angular granite or gneiss fragments and a bimodal grain size distribution are likely to represent clays that were tempered with igneous or metamorphic rock fragments (1B and 1D).

The second fabric group is represented by only one sample, which contains clay pellets and few weathered calcareous fragments that could be of metamorphic origin. The fabric is generally more porous and coarser than the samples of fabric 1. The presence of calcareous minerals in the matrix indicates that this sample derives from a different geological area than the other samples.

The last fabric group (3A-3D, \(n = 7\)) contains fine and well-sorted quartz and feldspar inclusions. The samples of this fabric are fired in oxidising conditions and relate to ceramics of Roman production. The non-plastic inclusions in this fabric are diagonally aligned to the vessel margins indicating that they were produced utilising a potter’s wheel. This fabric group can be further divided into four subfabrics based on the nature of the inclusions in fine fraction and the sorting and abundance of the quartz and feldspar minerals.
Technological development of ceramics from El Castru

The results of the petrographic analysis indicate that people at El Castru predominantly used ceramics from fabric group 1 throughout the pre-Roman occupation of this hillfort. From phase 3, 10 samples were analysed. The majority of samples (6) belong to fabric group 1. Three of these are distinguished by their optically inactive clay matrix (subgroup 1E). The single sherd containing calcareous rock fragments (fabric 2) also derives from phase 3.

All of the six sherds sampled from phase 4 belong to fabric group 1. There is internal variation in the abundance of inclusions in coarse and fine fraction. There is no notable variation between samples from fabric group 1 deriving from phases 3 and 4. This suggests that there was continuity in the clay sources used between these phases. Clays might have derived from a single, heterogeneous clay bed or from different clay beds upon granitoid geology.

Eighteen samples derived from phase 5. The majority of the sherds in this sample belong to fabric group 1 (15 samples). There are no clear differences between the fabrics of this phase and the previous phases although there are a few samples that lack the granitic fragments seen in the other samples or clay pellets.

Three samples in this phase are composed of fine mixed quartz and feldspar (fabric 3). The orientation and size of the inclusions suggests that these samples were shaped using a potter’s wheel. There is variation within fabric 3 in the abundance and orientation of the inclusions as well as the colour of the matrix.

Six samples derived from phase 6. Four of the samples in this group belong to fabric 3 and two to fabric group 1. The nature of the variation within fabric group 3 is unclear at this stage. The samples seem to have been made from clays that were carefully purified and often contain medium fine, well-sorted sand. It is likely that the ceramics from fabric 3 were imported to the site from a range of production centres like Lucus Augusti (modern Lugo), ceramics from which are found across Asturias (Alcorta Irastorza & Bartolomé Abraira, 2012; Villa Valdés, 2013).

Petrographic profile of geological samples

Based on the presence of granitoid inclusions in fabric 1, the geological survey focused comparing this fabric to clays from local granite intrusions and deposits from around El Castru. Geological samples 5 and 6, deriving from two locations located within the immediate vicinity of El Castru, contained fine (0.5–0.25 mm) subrounded to rounded quartz, occasional feldspar, clay pellets, and, at location 6, slate inclusions (Figure 5). The clay samples contain abundant iron-nodules deriving from the ferruginous sandstone bedrock. The relative scarcity of iron nodules in the ceramics of fabric 1 suggests that clays from El Castru are an unlikely source. In order to consider the possibility that local clays were tempered with granite, granite sand deriving from location 10 was mixed with clays from locations 5 and 6. These thin sections produced a profile that does not resemble fabric 1 due to differences in the abundance and size of minerals in fine fraction and the strongly weathered granite fragments in the geological samples compared to the less strongly weathered granite in the ceramic fabrics. The clays from location 5 provide a closer match with the fabrics of crucibles for bronze smelting investigated at El Castru, analysed by Farci et al. (2017, 340-341), which contain fine quartz and feldspar of similar sorting and dimensions. This suggests that, although local clays might have been used as a source material for crucibles, ceramics clays derived from a different source.

The nearest granite intrusions to El Castru are locations 7, 8, and 9. No obvious clay formations were identified at these locations, which were located at different slopes, sensitive to erosion. Silty deposits below the topsoil were sampled. Sample 7 produced the closest match with the ceramic fabrics in terms of the state of alteration of the granite. The granite in sample 8 is much more strongly weathered, and the minerals in sample 9 contained fragments of slate or
mudstone. Although no clay beds were encountered at the sample locations, it needs to be reiter-
ated that the sample locations are all located on top of or nearby Roman gold mines. Mining
activity will have strongly altered the landscape since the Iron Age, potentially removing suit-
able ceramic clays.

A larger area of granite geology is located near Salas, some 15 km north of El Castru. Clays
were sampled from three locations next to or near the San Vicente River, close to the villages of
Aciana and Godán. The samples contain strongly altered granite minerals as well as slate and
marl. These minerals are not seen in the thin sections, and therefore, this seems an unlikely ori-
gin for the ceramic clays used for the pottery at El Castru.

One clay sample derives from Boal, a large area of granite geology, about 50 km west
of El Castru. The sample from location 1 contained coarse low-grade metamorphic rocks
identified as slate. Slate is not present in the ceramic fabrics analysed. Nevertheless, a more
intensive geological survey of this area is needed to assess the location of suitable granite
clays in this area.

DISCUSSION

The key outcome of this study is the discovery of coarse granitoid fragments in a large propor-
tion of the samples from El Castru. This finding is significant because it demonstrates that
ceramic clays derived from a location that does not match the site’s geology. This is all the more
surprising because El Castru is surrounded by clayey deposits that seem suitable for ceramic
production. There are three possible explanations for the presence of granite in the Iron Age
ceramics from El Castru;

1. Clays from an unidentified local source were brought to the site for the production of
   ceramics, a possibility that is in line with the domestic production model as well as ideas
   about the self-sufficiency of Late Iron Age hillforts of the ‘deep rural’ model.
2. Ceramics were produced using clays from an unidentified local deposit at a different nearby
   site and finished products were imported to El Castru.
3. Ceramics or raw materials were imported to El Castru directly or via a different local settle-
   ment from a distant region where granite and gneiss formations are more extensive
   (Figure 6).
The preliminary results presented in this paper point out that clays from local granite sources and the ceramic fabrics provide no clear match. Granite in the soil samples was often more strongly weathered than the granitoid rocks in the ceramic clays and the soil samples often contained other minerals from the surrounding geology next to granite. However, due to significant landscape alterations through Roman and modern mining, suitable clay beds might have since disappeared. Below we consider possible scenarios for the local procurement of granite clays or the import of ceramics or raw materials from a distant source.

**Herding mobility and raw material procurement**

The first scenario that we consider is that of the local procurement of granite or clays for ceramic production at the El Castru. In this scenario, clay would be transported across the mountainous terrain from one of the nearby granite sources located within a 10 km radius around the site. Surveys of the ethnographic record have shown that the optimum procurement distance for ceramic clays falls within 1 km from the production site, whereas locations at more than 7 km distance are more rarely targeted (Arnold, 1980; Rice, 2015, 130). The distance of granite sources to El Castru seem to therefore be within potters’ catchment or ‘preferred territory of exploitation’ (e.g. Arnold, 1980, 149). However, most of the local granite intrusions are located at high altitudes (570–750 m above sea level) and across steep terrain, as well as being separated from El Castru by the Valbona River valley. Despite the ruggedness of the terrain, which will have increased the cost of movement, those elevated areas were exploited since Later
Prehistory for pastoralism (González-Álvarez, 2019). Ethnographic evidence and historical accounts demonstrate that valleys were usually avoided for mobility, which would mainly follow areas mid-way up the mountains (Fernández Mier, 1999).

Iron Age economies relied on combined subsistence strategies involving both herding and agricultural activities. The excavations at El Castru provided evidence for such livelihoods, with a significant abundance of cattle and ova-caprine bones found throughout the archaeological sequence (González-Álvarez et al., 2018, 230–233). Similar to preindustrial subsistence strategies in this region—well known by historical and ethnographic accounts—the inhabitants El Castru hillfort would take advantage of the diverse resources at their disposal within the different altitudes in their surroundings. Herding mobility in facilitates access to the closer granite intrusions around El Castru, as well as facilitating encounters with groups from hillforts located closer to such granite intrusions.

Pastoralism requires a detailed understanding of the landscape, including the location of appropriate pastures, adequate routes and mountain passes, and access to different types of vegetation. It is likely that this list also includes knowledge concerning types of soils and geology. Awareness of the properties of granite as a building material must have been widespread in the Iron Age populations of the study area, as evidenced by the deliberate sourcing of granite for sculpture and stone-work at castros such as Coaña (Jordá Cerdá, 1983; Villa Valdés, 2013) and San Chuis (Jordá-Pardo, 1990; Jordá-Pardo et al., 2014), both in the western area of Asturias. The location of such castros, upon slate geology, suggests that the utilisation of granite for stone architecture, sculpture or mortar stones is not determined by the local availability of such material alone (Carrocera Fernández & Jordá-Pardo, 1986). Furthermore, although knowledge of pre-Roman mining activity is limited, it is possible that Iron Age communities were aware of such locations through the spatial association between gold mineralisations and granite intrusions, even if areas with granite geology were small.

Thus, although it is not unthinkable that local granite clays or granite nodules to be used as temper were transported to the site, evidence to support this scenario is currently inconclusive. In contrast, it is likely that local clays were used for the production of crucibles (Farci et al., 2017). This suggests that, although the inhabitants of El Castru will have developed detailed material and environmental knowledge, the production of ceramics might not have been part of their technological repertoire.

**Regional specialisation in ceramics production**

A second scenario we can propose here is that the pottery at El Castru was produced from local clays from an unidentified source at a nearby production location. This option involves other neighbour groups inhabiting the hillforts located closer to the granite areas in the study area in a ceramics production and exchange system. In NW Portugal, for example, ceramics found at different Iron Age sites were produced from similar clays that probably derived from a single clay bed, around 10 km equidistant from each of the settlements (Little, 1990, 273). The challenge of this finding is to determine whether ceramics were produced at a single location and transported to nearby settlements, or whether clays were transported and each settlement produced ceramics independently. Nevertheless, settlements in this region appear to have been part of a network based either on the exchange of pottery or on the development of shared clay procurement strategies. In order to consider this possibility in the context of the present study, it will be important to study the mineralogical composition of the ceramics from contemporary sites in El Castru's surroundings. Future research on the ceramic sherds recently recovered at the hillforts of El Castru in Alava (Salas) and Penaguda in Bueinábs (Balmonte de Miranda) (Montes López & Villa Valdés, 2019) along new excavations at nearby Iron Age sites might enhance the consideration of this second proposal.
Long-distance trade or travelling potters

There is a distinct possibility that ceramics were imported to the site from a distant location (i.e., more than approximately one day on foot), where granite and gneiss formations are more extensive. The mineralogical composition of fabric 1 corresponds to areas where granitoid or coarse grained metamorphic rocks with a similar compositional profile are abundant and where there is little admixture of other lithologies. As shown by most of the geological samples included in the present study, minerals from surrounding geological formations have intruded into the deposits covering the granite formations, indicating that ceramics produced from such clays can be expected to contain more heterogeneous materials too.

Extensive granite and gneiss formations can be found in Galicia, some 80 km West of the site (Figure 6). Closer by, a stretch of granular porphidoblastic gneiss known as the ‘gneis de Pola de Allande’ is a further likely source area for the type of granitoid clays encountered in El Castrus ceramics (Fernández Suárez et al., 2012, 293). This is also the location of the well-known San Chuis hillfort, whose ceramics bear resemblance to those of El Castru in typology and decoration patterns. Future comparative ceramic petrographic research and the analysis of geological samples from around this site could therefore produce promising results. Furthermore, future analysis would also include geological samples from other locations at Boal.

In this scenario, the continuous influx of ceramics with a granitoid fabric throughout the occupation phases of El Castru provides unprecedented evidence of the (inter)regional circulation of ceramics during the Late Iron Age. Although evidence of long-distance exchange during the first millennium BCE has been discussed for the western and southern areas of Galicia (Ferrer Albelda, 2019; González-Ruibal, 2006; Naveiro López, 1991), the literature shows little evidence for the inclusion of western Cantabrian area in similar exchange networks. The economic underpinnings of such a supply system in Late Iron Age hillforts such as El Castru in Vigaña are yet to be fully understood as well as the extent of the distribution of similar ceramics in western Asturias, where no archaeometric studies have been conducted on Iron Age pottery.

A related possibility is that not the pottery but the clays were transported across large distances. This scenario is partly informed by evidence from Galicia, where several sites produced the remains of portable combustion chambers (Rey Castiñeira et al., 2013). Although there are still many gaps in our understanding of how these kilns were used, their utilisation suggests that potting equipment was sometimes transported along with specialist potters. Such equipment would explain why so little is known about the production location of Iron Age ceramics in this part of Spain, as well as pointing toward the mobility of craftspeople, utilising their own equipment and, perhaps, transporting suitable clays as well as pottery kilns. It is worth pointing out, here, that granite-rich clays were selected for the production of ceramics at a number of sites in Galicia (Rey Castiñeira & Soto Arias, 2002). Although Rey Castiñeira and Soto Arias suggest that clays were procured locally in Galicia, where granite geology is common, the preference for granite clays might have been part of a discriminatory clay selection strategy (sensu Bishop et al., 1982). The possibility that clay procurement strategies were shared as part of a deliberate procurement strategy can be addressed by future petrographic studies of ceramics from contemporary settlements in NW Iberia. It is important to point out that, to the East of our study area, in the Basque country, more heterogeneous clay and temper sources were exploited during the Late Iron Age (Olaetxea, 2000).

CONCLUSION

Our research is a first step in reconsidering patterns of mobility and interaction underpinning the procurement of ceramics or ceramic clays in rural mountainous areas of Asturias during the Iron Age. Our results demonstrate that a model of independent, domestic ceramic
production at El Castru is unlikely, contradicting prior expectations. Considering the results described in this paper, we propose models for the procurement strategies of pottery—or pottery clays—by El Castru’s inhabitants that can be further examined through a more extensive comparative study of ceramic fabrics and geochemical signatures of ceramics from other castro settlements as well as considering the petrographic and geochemical composition of local clays and clays from Pola de Allande and Boal. Evidence for clay procurement strategies or the circulation of ceramics or ceramic clays would greatly enrich our understanding of the lifeways of deep rural communities in this part of NW Iberia, demonstrating that such settlements might not have been as isolated as previously assumed. The insights arising from this pilot study reveal the potential of archaeometric studies and theoretical reflections on the social organisation of prehistoric groups and how these inform each other, enriching both fields of research.

ACKNOWLEDGEMENTS
This research was supported by BdG’s Leverhulme Trust, funded Early Career Fellowship entitled ‘Economies of innovation: tracing the potter’s wheel in Iron Age SE Europe’ (ECF2019-081). DGA’s research is currently supported by a Juan de la Cierva-Formación fellowship (FJCI-2017-33731) funded by the Spanish Ministry of Science and Innovation. The excavations at El Castru in Vigaña (2012-2013) were supported by Margarita Fernández-Mier’s research projects ‘La formación de los paisajes del Noroeste peninsular durante la Edad Media (Siglos V-XII)’ (HAR2010-21950-C03-03) and ‘Poder central y poderes locales entre la Antigüedad Tardía y la Alta Edad Media, 400-900 d.C. El Norte de Hispania y su contexto europeo’ (HAR2013-47889-C3-3-P), both funded by the Spanish Ministry of Science and Innovation. Carlos Marín’s contribution to the typological and formal analysis of Iron Age ceramics recovered at El Castru was fundamental to this paper. We are grateful to two anonymous reviewers for their helpful comments and suggestions.

PEER REVIEW
The peer review history for this article is available at https://publons.com/publon/10.1111/arcm.12695.

REFERENCES


SUPPORTING INFORMATION
Additional supporting information may be found online in the Supporting Information section at the end of this article.