Mediaeval agricultural space in Galicia: use and division of land in Marco de Portovello (Lugo, NW Iberia)

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Abstract
Through the excavation of an archaeological site in which traces of old field systems were recorded, linked to an area of hilly terrain devoted to extensive land-uses, together with our previous experience in the archaeological study of areas of settled and permanent agriculture in lowland areas of Galicia, we attempted to reconstruct the function and chronology of use of the areas that were extensively farmed, together with their processes of land allotment and constructive systems, by using archaeological analysis and radiocarbon dating. The data we have examined reveal that this organization of the hilly terrain occurred in the mediaeval period, before the start of the Late Middle ages, and at the same time as previous studies have made it possible for us to identify the creation in Galicia of intensive farming areas through the construction of complex infrastructures for permanent cultivation purposes shaped by agricultural terraces.

Key words
Landscape Archaeology, Rural Archaeology, Rural History, Early / High Middle Age, Field systems, Land-use.

Introduction
This article analyses a series of major linear structures associated with ancient enclosures or boundaries used for hilly terrain which, according to the results obtained, can be dated to the

¹ Several people have collaborated with us in the production of this article. The samples for the radiocarbon datings were prepared by Cruz Ferro Vázquez, of the LPPP at the University of Santiago de Compostela (unit associated with the Heritage Laboratory). Also, Anxo Rodríguez Paz and Pastor Fàbrega Valcarcel collaborated in the production of some of the figures included in the article (both of whom are members of the Heritage Laboratory of the Spanish National Research Council).
mediaeval period. The initial data were obtained from an archaeological excavation carried out in the area known as Marco do Portovello (Guitiriz, Lugo).2

These data are of great importance as, to date, the archaeological studies carried out on the processes involved in the formation and use of the rural environment in Galicia refer to spaces used for intensive agriculture (labradio) close to villages and hamlets, which contain terraces and embankments used for growing crops. However, in the study case presented in this article, we have the opportunity to analyse agricultural spaces that are some distance from the villages, situated on hillsides and containing land more suitable for growing winter cereals such as rye or wheat, and for gorse, used as the basic fertiliser for agricultural land.

**Landscape Archaeology and Rural Archaeology**

The archaeological study of the processes involved in the formation and use of the different types of rural space is a line of work that the Institute of Heritage Sciences (Incipit), belonging to Spanish CSIC, has been involved with since the mid-1990s. Our work is based on an archaeological approach towards the structures and elements that comprise the systems used for organising arable land, considering that these can be analysed as part of the material culture that the peasant societies have constructed over time. Our first experiences in this area date back to work carried out to control the archaeological impact of the Coruña-Vigo oil pipeline (1993-94) or the Galician gas network (1995-99). In these projects it was possible to carry out a stratigraphic analysis of specific elements of the agrarian landscape such as terraces used for growing crops, whose processes of formation and use were inferred through work that was almost completely based on archaeological and stratigraphic methods.

In time, both the objectives and the methodologies of the work were extended to include an analysis of the environmental evolution of the spaces containing the material elements that were studied, and the edaphic-sedimentological processes associated with their construction and use. An example of a project of this kind was the study of Monte Gaiás in Santiago de Compostela, focusing on the remnants of a strongly artificialised agricultural space which has suffered the gradual loss of traditional uses over time (and which has been replaced by the building site for the ‘City of Culture’). A combination of stratigraphic and edaphological analyses and C14 datings made it possible to reconstruct the sequence of construction and use of this space, showing that it dates back to the first centuries of the middle ages, when a profound transformation occurred in what had previously been an enclosed basin, which became an artificial agricultural space which has continued to exist, with the logical variations in scale and intensity, until the present day (Ballesteros et al 2006).

We believe that in order to understand the processes of change that occur in traditional landscapes, it is necessary to take into account, apart from the spaces that contain dwelling structures, the spaces used for obtaining intensive and extensive agricultural and livestock resources. In this context, Landscape Archaeology offers us the ability to de-code the current landscape, and to study and understand changes in the organisation and transformation of the territory throughout a long historical process. This means considering the traditional rural landscape as an archaeological site in itself. As a result, through Landscape Archaeology we can discover, understand and interpret the different ways of occupying, constructing and administering the traditional rural landscape.

Studies of this kind constitute a specific research programme in *Rural Archaeology*. This name refers to “the archaeological study of rural space and its component elements” (Criado-Boado 1991: 248). This implies considering agrarian space as a cultural space seen through Landscape

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1 The results of this work are included in the Technical Report for the Archaeological Control Project for the area of La Medorra de Marco de Portovello; Parga – Curtis section.
Archaeology, in which its component elements are considered as archaeological elements that can be studied in depth, and to which a specific methodology is applied.

The rural landscape consists of both the area occupied by the home and the area dedicated to the exploiting and obtaining agricultural resources (fields containing crops), livestock resources (hillsides) and forestry resources (woods and forests), the network of paths and roads that joins and communicates the different spaces, and the other infrastructures that form a part of rural life (irrigation and drainage structures, quarries, and spaces used for specialised production and transformation processes – such as water mills, which are especially important in Galicia) An archaeological study of a rural space must take into account all of the evidence offered by the territory that was used by its inhabitants, taking advantage of the abilities of archaeology to analyse the structures and buildings that modified the landscape according to the economic conditions, environmental resources and social needs of the community (Fig. 01).

In addition to the purely archaeological studies carried out on the agrarian forms and elements, an important part of this investigation consists of taking soil samples and carrying out Carbon 14 dating of the organic material they contain. Carbon 14 makes it possible to obtain absolute datings for the stages of construction of the agrarian element in question, to date the time of construction and to establish the chronology of the successive extensions of the agrarian system. The results we have obtained to date are of great interest, and reveal that we can use them to establish the moment of construction and the ‘genealogy’ of the old Galician agrarian system.

The Galician rural landscape consists of two different, specialised types of productive spaces: hillsides and fields. Each of these uses is well adapted to specific conditions of the Galician environment, although they are also the result of human action, taking advantage of the characteristics of the environment and based on a unique socio-economic rationale.

The characteristic rural landscape of Galicia, which is now undergoing an accelerated process of transformation and disintegration, could be seen clearly until quite recently. This landscape may be defined according to a theoretical and practical model which we have denominated concave landscape. Above all, this model means that the most significant geographic unit in Galicia is the valley. The network of valleys organises the population and the historical or traditional use of the territory. The boundaries of parishes or local councils frequently coincide with the approximate boundaries of small or medium-sized valleys, respectively, and the area of a village or hamlet even generally coincides with a singular sector of a valley or small basin (Fig. 02).

The profile of the valley also organises the chain of uses of the land (the origin of its “concavity”). The settlements are generally located half way up the hillsides. On the edge of the houses are the allotments that are worked intensively; nearby, a little farther uphill or generally a little lower downhill, are the fields used for growing crops. At the bottom of the valley are the pastures and areas of wet woodland. Uphill are the forests, and farther up, where the land is less steep, the areas of hillside or for extensive working. In the higher areas, where the soil is shallower and the height effect is more concentrated, are the few areas of land that can be categorised as uncultivated.

This type of land use took into account all of the wide range of possibilities the ecological environment could offer, applying a model of ecological rationality based on humanising the natural chain of soils and vegetation that is typical of the Galician environment, in order to adapt the uses of the land by taking advantage of the environmental conditions (Ballesteros 2003: 13-14).
This landscape model is based (as pointed out by A. Bouhier) on the complementarity of the farmland and the hillsides. This is used for three important purposes: to provide pastureland for the livestock, to grow cereals using the rotation system, and to produce gorse, used as a fertiliser to keep the farmland fertile, and therefore the backbone of the system.\(^3\)

Nevertheless, we do not know when this system of structural complementarity was first created, which reached full maturity in the seventeenth and eighteenth centuries and could be seen until recent times in Galicia (and still today, despite the post-industrial changes that have affected the Galician countryside).

Research carried out by the Heritage Laboratory in recent years has led to the discovery that the construction of terraces in Galicia dates back to the first centuries of the middle ages (between the fourth and tenth centuries), when a profound transformation may be seen in the rural environment that led to the appearance of an agricultural landscape which, with logical variations in scale and intensity, has remained in use until the present day (Table 1). One of the first recorded cases was in “Lume de Quintas”, in Pontevedra. Here it was possible to document the planning process involved in the construction of a terraced area that is still in use today, using a construction system known as hill cutting with systematic infilling\(^4\), a highly characteristic method as its construction involved completely modifying the hillside, reducing the original soil levels until reaching the bedrock, where soil was added to create a level, stepped surface. At the same time, the soil that was added was arranged in order to facilitate drainage, alternating layers of organic earth with other layers containing small stones and sand in order to prevent the land from becoming waterlogged, which would cause the roots of the plants to grow to rot. This terrace was dated to 1078 ± 43 BP. Another example was found in “As Pontes”, Lugo. By excavating the terraced surface, an interesting series of plough marks were found in a paleosol from the mediaeval period (1340 ± 60 BP), which also provided information on the agrarian technology from the time (Ballesteros 2010: 28-30).

However, we did not have any references about what happened on the hillsides during the same time period, and the earliest dating for the traditional structures used to divide the hillsides in Galicia. This is why the data we present in this study (from Marco de Portovello and complemented with another study case we will also document, in Coto Vello), are so relevant.

**Uplands in Galicia**

What is traditionally known as monte (current translation would be “upland area” but actually is a more complicate land category category) in Galicia, is a space that is used as a complement to the spaces used for intensive agriculture (arable land), without which these spaces could not be used permanently for growing crops. The uplands are not only a place used for forestry production and obtaining firewood, but is also used for aspects that are essential in maintaining the Galician agrarian system: as pasture for livestock; to obtain gorse which is used as bedding for livestock, and then mixed with their manure to be used as a fertiliser or estrume\(^5\) which makes it possible to maintain the fertility of the intensive crop-growing land; it also provides land for growing cereals controlled by slash-and-burn agriculture or estivadas.

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\(^3\) In coastal villages, seaweed was used as a fertiliser for farmland. This traditional method, known as argazo, consists of spreading fresh seaweed on the land, reducing the amount of acidity in the soil, at the same time as increasing the amount of organic matter, nitrogen and phosphorus.

\(^4\) Terminology taken from a classification of agrarian terraces based on the types of stratigraphy seen in studies carried out by the Heritage Laboratory. See Ballesteros Arias et alii, 2006.

\(^5\) Name used for the typical plant species found on hillsides (gorse, broom, ferns, etc.) mainly used as bedding for livestock, and then used as fertiliser for arable land when mixed with their manure.
also called *cabas or cabadas*6, which are mainly worked collectively; and finally, the hillside was the reserve space to increase the amount of arable land by new ploughing.

According to Bouhier (1979), the communal hillside was the true backbone of the traditional Galician agrarian system, as it allowed farming units to reproduce by providing them with additional farmland for crops, extensive pastureland, firewood and fertiliser. Part of the hillside was distributed amongst the local inhabitants in *tenzas*, a term used to denote each of the portions of land into which the hillside was divided for growing wheat using the slash-and-burn system; once the harvest had been gathered, it once again became common land. These large plots of land, surrounded by earth enclosures or *valados*7 and parallel ditches (called *gavias* or *gaveas*) from which the earth to build the enclosures was taken (or the earth walls that divided up the plots on the hillside) (Fig. 03), underwent a systematic cycle, alternating crops using the slash-and-burn system, extensive grazing during the following years (taking advantage of the natural meadowland of grass species that recolonized the land after it was abandoned), and the production of gorse, which begins to grow after the second and third year from abandoning cultivation, and which was left to grow for six to ten years, at which point it can be easily cut, or otherwise used to produce *estrume*, or cut and burned. After this period of time, gorse can reach a height that makes it very difficult to cut (reaching a height of two metres, it is a tough, prickly plant that is hard to work; its wood was used to make wall plugs), and in this case was used as firewood in the home.

The communal hillsides were gradually fenced in and privatised, especially from the second half of the eighteenth century onwards, ending with a share-out of land amongst the local inhabitants. On occasions, areas of open, shared hillside, which were only divided up into *tenzas* for slash-and-burn agriculture, were interspersed with areas of enclosed hillside, where the communal land was privatised. According to the research carried out by Cardesin (1992), we know that from the eighteenth century onwards, these cycles were associated with a greater or lesser specialisation in the type of livestock, which in turn was heightened by the price of meat in international markets. From the 1950s and 1960s, only a small, relatively unfertile area classified as “common land” was occupied by the National Forestry Service and repopulated with fast-growing, poor quality tree species such as eucalyptus and pine, used for paper production.

A great deal of effort was required to cultivate hillside areas. The slash-and-burn system involved cutting back the undergrowth and pulling out any clumps of grass, stacking them up and leaving them to dry over the summer. Once they were dry, they were burnt; the earth was turned in order to mix the ashes with the soil, adding all of the nutrients of the undergrowth, and at the same time to correct the acidity of the soil (Fig. 04). This is a very ancient technique, associated with itinerant agriculture, which consists of taking advantage of the fertile stage that occurs after burning the vegetation from the hillsides in order to cultivate winter cereals (wheat or rye). This crop was kept for one or two years. The plot was completely abandoned once its productive capacity had been exhausted. It could only be re-used once bushy vegetation had re-established, after a period of ten to twelve years. As a result, the hillside was an extension of the arable land that made it possible to obtain occasional harvests of cereals. These harvests were highly appreciated by the farming communities as they did not have to pay any duties on them to the local lord; this almost certainly explains why they were

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6 The slash-and-burn system is known by different names in Galicia: *queimadas, cabadas, estivadas, borralleiras, tolleiras, bouzas*, etc. The variety of names is a result of extending its meaning, as some terms which refer to one of the stages of the operation, many of which involve fire, are used by farmers to refer to the whole of the process (Bouhier 2001: 819).

7 In the Galician language, the word *valos* or *valados* refers to the enclosures that surround plots of land by piling up embankments of earth.
of such interest, despite the large amount of work involved, which was always a communal effort involving extended family networks and members of the local community.

Gorse, and therefore the hillside, were also important in order to guarantee the supply of estrume (Fig. 05). In Galicia, intensive and permanent cultivation of different types of crops is only possible with the help of intensive fertilising. The fertiliser traditionally used in Galicia is organic (manure or estrumel), obtained by mixing gorse from the communal hillsides with animal manure, mainly from bedding used for livestock (esterco de corral), but also with manure collected from paths (esterco de fochancas). We recently documented this system from a series of ethnographic interviews carried out in the mountain range of O Suído (Galicia): the process consisted of laying gorse on the paths, which as a result of the continuous movement of livestock and wagons, was crushed, mixed with water and manure from the livestock, and rotted.

As a result, the low-lying hillsides are used for intensive agriculture, and are proof of the decidedly autarchic nature of these peasant communities. In fact, for each hectare of arable land, three times more gorse land is required (data from Fernández Leiceaga, citing by F. Molina 1979. Producción e ecoloxía do monte galego, RGEA, nº 2)⁸. Gorse is therefore the basis for the exploitation of the soil, and makes it possible to cover the foodstuff requirements of the peasant family, and to pay rent.

Here it is important to do away with the idea of identifying gorse areas as a regressive stage of woodland. Instead, gorse stands are plant formations that are wholly created by farming communities. They are more an aspect of the humanised landscape than an element of the natural environment.

The areas used for planting gorse are known in some places as chousas¹⁰ or curros, toponyms that are regularly found in the Galician landscape and which constitute a type of arable land that connects with the hillside. These are plots of land that are always enclosed, mostly using valos, with poor soils or in peripheral areas, where livestock are occasionally taken, but which are generally used for seeding gorse. In the past, these were usually small reserved areas which, due to being unsuitable for growing crops, would be used by peasant farmers for these purposes depending on their needs. Today, many have been transformed into stands of pine or eucalyptus trees, or have been transformed into pastureland and meadows for livestock.

**Description and characterisation of the area**

As part of the project to modernise and adapt the railway line from Palencia - A Coruña, on the section between Lugo and Curtis, an archaeological protection zone was established around the site of Medor da Marco de Portovello. This is a relatively well-preserved Neolithic barrow. As archaeological remains are often found in Galicia in the area around barrows – often the prehistoric settlements that existed at the same time, before or after the barrow – and although the barrow in question was not affected by the work, an archaeological control process was applied to earth-moving work in this area. This led to the discovery of long ditches

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⁸ García Fernández recorded this way of turning gorse into fertiliser. Every four or five months, gorse was scattered on the paths, without completely covering them. A layer of sand was scattered on top, which was then covered with crushed straw. Stones were placed on top to keep it in place, and it was then left to ferment until it was time to make a new batch of 'estíércol de hollancas' (García Fernández 1975: 120).

⁹ Although this figure depends on the type of crop (for example, potatoes are more demanding than corn, and corn is more demanding than wheat), which is the reason why the proportion of hillside land to arable land is traditionally 3/1 in Galicia. In the past it was even higher: in 1752, 92% of the hillside was scrubland.

¹⁰ This name is also used for poor pasturage which is occasionally used to obtain a cereal crop using the slash-and-burn method.
dug in the substrate, which in turn resulted in an archaeological intervention being carried out to document these remains.

The protected section is in the area of Portovello, in the parish of Santa María de Lagostelle (Guitiriz, Lugo). This is a relatively flat area covered with undergrowth. Guitiriz is in the west of the region known as Terra Chá, which forms a part of the high plain of Lugo, at an altitude of between 400 and 600 metres. It is limited to the west by the mountain ranges of the Dorsal Gallega (Cova da Serpe, Cordal de Montouto and Serra da Loba), which contain the highest points, and mark the dividing line between the rivers of the province of A Coruña and the tributaries of the River Miño that run through this region. This practically flat relief is dotted with small hills that serve as natural lookout points. The river network, which runs eastwards and runs into the Miño, consists of the River Labrada and the River Parga (Fig. 06). It has an oceanic climate with continental features in terms of temperature and precipitation. The most frequent soil types in this area are dark soils in the flattest, lowest zones, the most suitable for growing crops, although there are also abundant ranker type soils in the mountainous areas, very fine soils that are suitable for forestry use and scrubland. In the lowest, poorly drained areas, there are waterlogged gley and pseudogley soils, which are suitable for wet pastureland, but not for growing crops.

The population is scattered throughout a large number of small towns and villages, which are essentially rural. In economic terms, based on the agrarian census of 1972, the majority of the active population were engaged in agricultural activities in Guitiriz (52.48%). Slightly more than 15% of the municipal district is covered by cultivated land, together with natural meadows and pastureland, while 71% of the terrain is occupied by hillsides (Source: Gran Enciclopedia Gallega Voz “Guitiriz”, 1974).

In this same decade, the majority of the surface used for agriculture was dedicated to twice-yearly rotation, alternating between a winter cereal (wheat or rye) with turnips and potatoes or corn. Comparing the current situation with that of 20 years ago, it is noticeable that rye is now grown much less than wheat, although it has not been completely replaced as it is better adapted to soil conditions in this area. Also, more crops are now grown that are used as forage for livestock, which is increasingly important in the area, as proved by the development of artificial meadows.

The area of Marco de Porto Vello is a point where several communications routes built at different times converge: the railway, built in the nineteenth century, the old National 6 road, and the modern North West Highway, which connects with the centre of Spain (Fig. 07). It is actually a natural transit point, as it is a pass in the mountain range that runs across the middle of Galicia, making it possible to cross easily from east to west, and connect the lowlands around the estuaries of A Coruña and Betanzos with the interior Galician peneplain and the lands around Lugo. In fact, the toponym porto is the Galician word for a natural pass used for the transit of people and animals.

This point also marks the territorial limit between provinces and local councils: Aranga (in the province of A Coruña), and Guitiriz (in the province of Lugo). This territorial limit can be seen in the aerial photograph by the different way the land is used. The toponym of the zone refers to this limit, as marco is the word for a boundary stone marking the edge of a property or plot of land. It is possible that in the past, the barrow at this point may have served as a marco.

In terms of land use, this is a typical hillside zone, dedicated to the cultivation of winter cereals, shrubland and natural pasture. It is located in a midway point between the farmland close to the village, characterised by arable land divided up into small plots, and the hillside itself with the extensive uses described above.
Data

Archaeological results

The archaeological intervention carried out in the area involved excavating five test pits by hand, and using mechanical diggers to uncover the whole of the study surface. Once this area had been opened, the structures that appeared were surveyed and documented, and finally a series of cuts were made in order to obtain sections of all of them (Fig. 08).

As a result of this work we were able to document an interesting group of eighteen very long ditch-type structures, together with some grid-type structures with parallel and perpendicular furrows in a very regular pattern, and others with a clearly circular design. The stratigraphic sequence is uniform throughout the whole of the surface that was evaluated: firstly, a modern A horizon was documented, which lies directly over the mineral horizon of schist substrate. In all of the structures a single deposit was documented with interior accumulation from silting, in some structures with gravel deposits at the base. The type of cut is very similar in all of the ditches that were documented. They have a flat section, vertical walls and are quite shallow. No significant archaeological material was documented during the excavation.

We will now go on to describe only the structures that have been dated using the C14 method, which are named ditch A, ditch C and ditch I, located in sectors 1, 3 and 6 respectively (Fig. 09).

Ditch A

This ditch, in sector 1, is linear but has a pronounced curve that runs almost in a quarter of a circle from the NW to SE. It is 25m long, and has an average width of 0.5m.

Inside the ditch, a deposit (SU 100) of earth with an organic appearance and shallow depth (maximum of 15 cm) was documented. This is the only silt deposit in the ditch, and has quite a sandy appearance with a fine grain; at the base, over the cut, are small quartz stones; this SU coincides with the current A horizon. The cut (SU 131) was made in the mineral horizon; the structure was not emptied completely, and as a result, only some 25 linear metres were documented. The cut has a shallow, U-shaped profile, with nearly vertical walls. At the base, in the southern section of the ditch, are a series of marks which are small, nearly quadrangular incisions 15cm long and 5 cm deep, and which are repeated constantly for nearly 6 m at the base of the cut (Fig. 10).

These marks may be the imprint left in the mineral horizon by a tool such as a hoe, used to cut the ditch. The hoe was a highly important tool in the peasant economy, as it was used to till the soil in the hillside, and was especially useful in the light, stony soils. In general, the majority of the iron tools that were used in the modern and contemporary age (and in some places continue to be used) had already appeared by the High Middle Ages, and have similar shapes.

Ditch C

At the eastern end of sector 3, this is a linear ditch but with a pronounced curve, running almost in a quarter circle from the north to south. It is 15 m long, with an average width of 0.7m and an average depth of 10 cm.

The presence of two deposits was documented during the excavation process: the first (SU 102) containing brown earth with a sandy texture and a medium-thick grain, with some roots due to the proximity of the surface layer of the soil. Beneath this SU is SU 129; this much shallower, sandy deposit with a medium-thick grain is grey in colour and lies directly over the cut of ditch SU 130. The cut is made in the mineral horizon with a U-shaped profile, a flat base and concave walls (Fig. 11).
Ditch I

Located in the southern part of sector 6. The ditch is nearly 26 linear metres long, but is almost semi-circular and oriented from the SW to NE, with an average depth of 38 cm and a maximum width of 1.2 m.

A deposit was documented inside it (SU 109) consisting of dark brown earth with a highly organic appearance, quite uncompact, with the presence of roots due to its proximity to the current ground level, and some gravel and sand over its base. This SU corresponds with the current A horizon. The cut (SU 133) was made in the mineral horizon, with a V-shaped profile, concave walls with a maximum width of 1.10 m, and a maximum depth of 20 cm.

Part of the trajectory of this ditch coincided on the surface with an earth enclosure that separated two plots used for different purposes – one as a meadow, and the other for shrubland. This earth enclosure, as well as separating the two plots, also serves as the territorial boundary marker between the provinces of A Coruña and Lugo (Fig. 12).

Plough furrows: the microforms of the relief

Another type of evidence found during the excavation were marks left on the ploughed land (Fig. 09). These marks cross over each other lengthways and widthways, forming a grid that is perfectly discernable on the mineral horizon (Fig. 13).

Taking into account the context in which these marks were documented, the most likely reason is that they are associated with harrowing carried out using a Roman or symmetrical plough. The use of this tool is recorded from the High Middle Ages, and is still in use today due to the fact that it is effective in specific climatic and soil conditions found on hillsides, with very light, shallow soils. This plough consists of a thick shaft drawn by one or more pairs of oxen to carve a furrow in the soil, at the same time as removing the soil evenly on both sides. The ploughshare is conical or triangular, which lifts up clumps of earth, leaving an intact wedge of earth between each of the furrows, meaning it is necessary to plough in a crosswise direction. This means that the soil is pulverised, preventing excessive evaporation and helping to keep the earth fertile, by bringing up mineral substances from the subsoil to the surface (Cantera 1987: 33).

Analysis

The analysis of the formal data led to us ruling out the initial hypothesis which associated these structures with the barrow and considered them as dating from prehistoric times. Instead, the most obvious alternative hypothesis is that these were remains from a division system used for Galician hillsides, specifically documented through the linear ditches accompanying the enclosure systems. However, it was necessary to confirm this hypothesis, and above all to date this system and connect it with the existing plot system and with other cases. We have found a similar record in other zones (Ballesteros 2003: 48-57). As in Portovello, these structures were located in open spaces, in land in contact with the current hillsides, which are very uniform both in terms of their morphology and the way the land is used. But the best parallel for these data, which allowed us to understand their significance more completely, came from a test pit dug in an enclosure from the hillside in the Sierra del Xistral range in Coto Vello (Lugo). However, before detailing the data from this excavation, we will pause to analyse the results of the absolute datings that were made.

Absolute datings

Samples were taken from soil sediments that fill the linear structures. Extracts were prepared from them in order to determine their age using C14, based on the concentration of organic
material in the soil. The samples were prepared at the “Laboratory of Paleoenvironment, Heritage and Landscape” of the University of Santiago (research unit associated with the Spanish National Research Council), under the supervision of Antonio Martínez Cortizas. Here we would point out that as in the previous case, no ceramic material was found in the test pits that were excavated. In these cases, the dating based on the extraction of organic material works to date soils, as it dates the organic material incorporated into the soil formation process. This technique makes possible to date the soil itself and it has been intensively used by pedologists in Galicia and validated by their publications in outstanding journals; an example on the application of this radiocarbon dating methodology can be seen in Kaal et al, 2008.

As a result, three samples from three archaeological entities were dated using C14. The datings obtained have been processed at the laboratory of Uppsala University (Table 2). All of them have been calibrated at 2σ; this means it is more likely that the real date is within the calibration intervals, although the age ranges presented by the dating are wider.

**Hillside enclosures in Coto Vello, Serra do Xistral (Lugo)**

Based on the archaeological monitoring and control process carried out on construction work for the Álabe-Montemaior Sur wind farm (in Abadín, Lugo)\(^{11}\) carried out in order to verify and reduce impacts on the cultural heritage recorded in the area, a system of enclosures or valos was documented high up in the O Xistral mountain range, associated with old farmland for the cultivation of cereal using the slash-and-burn system. An archaeological test pit dug in one of these enclosures made it possible to identify that the space had been organised and the high parts of the mountain range prepared for growing crops in the High Middle Ages.

The mountain range of O Xistral belongs to the most northerly group of ranges in Galicia, which run from the south to north-east along the frontier between the municipal districts of Valadouro and Muras (Lugo). Their highest peaks are O Cadramón (1056 m), Seixo Branco (1057) and Chao de Lamoso (1039). Rivers flow from them towards the Cantabrian Sea (Landro, Ouro and Masma) and towards the Atlantic Ocean (Eume). In the interior of the mountain range, this river network is associated with a large number of sedimentary basins and peat bogs which suffer from the typical problems connected with obstructed drainage, which partly explains the importance of land dedicated to pasture, and its corresponding association with cattle.

There are few centres of population in this mountain range, limited to very small, scattered villages on the slopes of the valleys, at times closed in on all sides. The fields used for growing crops are on the least steep slopes, above the valley bottoms. On the contrary, the peaks are covered with shrubland, with low woodland growing along the watercourses. But the range itself was also an ideal location for the development of extensive livestock farming\(^{12}\) and agricultural activities complementing the work carried out in the fields used for growing crops in the valleys. This can be seen in specific parts of this landscape, where old hillside plots can still be seen, surrounded by stone walls, or with larger earth enclosures.

The enclosures studied on the hillside are found in the final section of the flank of Pena Vella, in a flat area which has large numbers of boggy areas known locally as *brañas*. These are

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\(^{11}\) The results of the archaeological test pits are included in the report for the Project for the Control and Correction of Archaeological Impact of the Álabe-Montemaior Sur Wind Farm (Abadín, Lugo) written by Raquel López Noia, 2005.

\(^{12}\) Through the ethnographic interviews that were carried out, it was found that up until some forty years ago it was usual to find livestock grazing completely freely, or which spent most of the year on the hillside, watched over in the afternoons by their owners.
specifically found in the area known as Coto Vello, which belongs to the parish of San Pedro de Labrada, in the local council of Abadín. These are earth structures that surround plots in which slash-and-burn agriculture was carried out to grow cereals (wheat and rye)\textsuperscript{13}. The earth enclosures are approximately 0.5m high, with a width that varies between 1.5 and 2 metres.

Taking advantage of the digging of a ditch for cables leading to the wind farm, the transverse profile of an enclosure was excavated. Samples were then taken of the levels identified for C14 datings, and a survey was carried out using GPS of the enclosures located in this area, creating a detailed graphic record (Fig. 14).

The stratigraphic reading of this agrarian element is very simple. Beneath the plant level, a layer was documented composed of large-grained saprolite with a large number of small stones, corresponding to the convex part and jutting out from the enclosure. Beneath it, an A horizon with low cohesion appeared, with a very fine texture, which continues horizontally towards the piece of arable land of which this boundary forms a part. A second, more compact A horizon was documented beneath this level, with a clayey texture, fine grain and very dark colour, which also continues towards the surface of the plot. The C14 dating of this layer showed that it was from the thirteenth century AD. A third A horizon was defined beneath it, with the same characteristics as the previous level, although with a lighter colour, and which is interrupted where the arable surface begins, and which was shown by radiocarbon dating to be from the fifth century AD. Finally, a transitional mineral horizon was documented which comes before the C horizon. On the outside of this structure, a channel or gavía was documented, which apart from marking the external boundary of the plot, made it possible to drain off rainwater. This channel, carved into the saprolite, is filled in with a layer of small horizontal deposits of earth, saprolite and medium grain sands (Table 3).

As already mentioned, these radiocarbon results correspond with other datings of agrarian elements carried out by the Heritage Laboratory in different contexts, whose results indicate that the traditional Galician agrarian system took shape in the High Middle Ages. For this reason, it is of great interest to compare them with the data from Marco de Portovello.

**Analysis of changes in the arable land**

The surface analysis of the arable land, together with the interpretation of the aerial photography (both from the American flight from 1956 and the more recent photograph), allow us to observe that the area of Marco do Portovello has a series of structural changes that coincide with changes in the exploitation and use of the agrarian space in recent times. However, by observing this dynamic in detail we can infer information about the past.

Despite the short period of time between the two, comparing the aerial photographs reveals how quickly the traditional agrarian landscape was changed and transformed in this area. Apart from highlighting the progressive construction of public communication works that connect in this area, from the perspective of land use it can be seen that in the valley areas close to the centres of population, there is a predominance of arable land compared to hillside areas. The field divisions are dominated by elongated, narrow, open shapes, together with quadrangular shapes, forming small areas of farmland surrounded by traditional paths and

\textsuperscript{13} Thanks to an interview with a resident of the village of Currovedo in the parish of San Pedro de Labrada, we found out how slash-and-burn agriculture was carried out on these plots in this part of the O Xistral range. At the end of the rainy period (at the end of May), the first stage of work took place, which involved removing the plant cover. Clods of earth were removed and turned over using hoes. The second stage took place during the summer months, when the dry clods of earth were stacked in rows, and then burnt. Once they had burnt completely, the ashes and burnt earth were spread over the land. Finally, between September and October, the soil was worked using ploughs, sowing wheat or rye depending on the needs for that year. Ordinary rye was used, and the wheat was known as “hillside wheat”, with gluten-rich grains, which ripened before the wheat sown in the fields. According to the interviewee, this activity came to an end in the 1970s.
streams of different sizes. This field division has remained the same over the centuries: what has changed is the way it is used. As time goes by, it becomes clear that the countryside has been abandoned, together with the new uses and values attributed to the land. The images show the importance of forestry plantations with foreign species in comparison to fields with crops, an increased number of meadows and spontaneously created shrubland, and other irreversible changes, such as the creation of the network of roads we previously mentioned.

In contrast to the apparently more stable area of arable land is the hillside area, situated at a higher level and which forms a part of the southern end of the mountain range of Cova da Serpe. Here a noticeable change may be seen, both in its structure and in the type of exploitation. The aerial photograph from 1956 shows that the hillside is divided up into long, polygonal plots used for slash-and-burn farming, next to large areas used for growing gorse. As the years go by, these small pieces of land are joined together into larger plots growing the same types of crops, either as meadows for milk production, or for forestry purposes. In fact, several changes occurred, mainly in the modern and contemporary age, which led to the constant reorganisation of agrarian habits in the Galician countryside (Marey Pérez, M. et al 2004). These include the process of change that occurred with the arrival of new crops such as corn and potatoes in the eighteenth century. Another process occurred as a result of the introduction of new breeds of cow, such as the Friesian. This stabled breed requires more feed than local breeds, i.e. larger areas of meadows and grasslands with forage, meaning it was necessary to clear land on the hillsides, and improve the quality of the soil by using chemical fertilisers. Another change was directly connected with the planting of foreign tree species, due amongst other reasons to an increase in wood prices. Finally, it is important to consider another essential factor when analysing the processes of change that have occurred in recent centuries in the Galician countryside: the mass emigration of the Galician population. This migratory process has led to major imbalances both in the system of population and the territory, considerably transforming the landscape.

If we carry out this comparative analysis at a smaller scale and focus it on the zone of Marco de Portovello, we see that these processes of change in the hillside lands are quite drastic. In the image from 1956, it is clearly noticeable that the arable land is divided into very long, lengthways and transverse strips of hillside, used for different purposes (slash-and-burn farming, fallow cultivation, shrubland, etc.). However, in the image from 2003, we see that the land is more uniform; the former mosaic has become a homogeneous space, with rectangular plots mainly dedicated to pasture and shrubland, but this time associated with the abandonment of the countryside (Fig. 15).

Within this process of changing forms and land uses, it is interesting to note one triangular plot which kept its shape over these years, and whose eastern edge coincides with part of the route of two of the ditches that were documented in the excavation process, one of which dates from the twelfth century (see ditch I). This is also precisely the point that marks the territorial boundary between two provinces, and so this may be why it is the only plot that has remained unchanged over the centuries.

The rest of the ditches that were documented may be identified with shapes that were recorded in the old map of field boundaries, although the low resolution of the image prevents us from carrying out a more precise comparative analysis. In any event, the empirical evidence reveals the continuous transformation of the hillside in this area since at least the High Middle Ages.
Evaluation and Consequences

Up until now, the only chronological indicator we had to help us understand the development of the agrarian space was by consulting documentary sources. Here we found a series of obstacles which mean that it is not possible to trust these sources completely. On the one hand, there is a total lack of written sources prior to the year 800, which means it is impossible to obtain a detailed understanding of the situation before this year. There are no real data as such until the twelfth century, when a clearly agricultural and livestock based economy is documented, with consolidated forms of arable land that were created in the previous centuries. Demographic growth and an increase in the output of the land capable of supporting the increase in population that occurred in previous centuries, are the causes we suggest to justify this phase expansion that took place between the tenth and thirteenth centuries.

On the other hand, the mediaeval documentary sources for these centuries are very limited, as they almost exclusively refer to the properties of monasteries, cathedrals and the nobility. This means that these documents do provide us with data, but not on the peasant way of life that generated economic production through the transformation of the landscape.

In contrast to the limits of the documentary sources, the archaeo logical and radiocarbon data (although not without some difficulties and problems in their interpretation), together with the analysis of aerial photographs, allow us to identify the process of creation of the mediaeval rural landscape, how property was structured, and the rythm at which changes and transformations occurred in these spaces. Above all, these data show that the intensification of land use and the artificialisation of land use through an extensive process of architecturalisation occurred before the Late Middle Ages.

The most relevant aspect of this study is that it shows how this process, which we had previously identified between the sixth and tenth centuries in agricultural terraces in areas of arable land (Ballesteros-Arias et al 2006), also reached the uplands, which had subdivided plots allowing it to be appropriated and used by peasant households. Data presented in this paper show that land allotment in galician hilly (monte) areas occurred between X and XIII centuries and was kept at least till the end of Late Middle Ages. A major consequence of this evidence, is to demonstrate that the complementarity between the ager-saltus, arable land-hillsides and intensive cultivation-extensive cultivation that characterises the traditional landscape of Galicia, would have been present from the begining of Late Middle Ages (X century and onwards). This consequence demands further analysis and a deep explanation in historical terms. But the aim of this paper is not provide this account but to just present the data what show the allotment and use of monte areas at the end of Early Middle Ages.

This peasant logic is maintained in post-mediaeval communities in terms of continuing to grow crops in valley zones, supported by growing, gathering and combining gorse with manure to make fertiliser, taken from the monte areas and uplands. Of course, this cycle of activity around lowlands and uplands was also involved in the upkeep of livestock, something that was essential in the peasant economy.

A further observation derived from this initial study is that in comparison to the greater stability of the plots of arable land in the valleys, the hillsides and uplands were divided up into plots at a much faster rate. The reason for this may be that while the continuity of the forms of arable land depended on the stability of private property and the vast amount of effort and labour involved — meaning they could not be easily modified —, on the hillsides precisely the opposite was true. Here the property was communal, subject to regular changes in peasant strategies and to the concurrence of the different interests of the rich and the poor households: the rich, placing the emphasis on using the land for livestock, while the poor preferring to control slash-and-burn agriculture. That is why on the hillsides the forms can be
easily changed, because their economic orientation is not fixed by agricultural buildings or by technological difficulties that affect taking advantage of them, and they do not require the investment of large amounts of effort.

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Figures

Figure 1. Traditional Galician rural landscape, where the different productive spaces around the village can be seen.

Figure 2. Ideal model of a concave landscape in Galicia, illustrating the different ways terraces are used around the valley.
Figure 3. Different types of walls and enclosures that surround properties and model the landscape in hillside areas.

Figure 4. Photograph from 1930 showing farmers carrying out slash-and-burn agriculture for cultivating hillsides. (Source: Ebeling 2003).
Figure 5. Recent image showing manure being transported to fertilise land used for growing crops.

Figure 6. Location of Marco de Portovello, Guitiriz (A) and Coto Vello, Lugo (B), which we refer to later on in the context of Spain and Galicia.
Figure 7. Aerial photograph, with the excavation area shaded in (Visor Sigpac).

Figure 8. Panoramic view of the area once manual excavation work had begun.
Figure 9. Plan view of the excavation work over an aerial photograph from 2003. The image shows the position of the Neolithic site of Medorra do Marco de Portovello and a plan view of the excavation with the location of the ditches that were found. Those marked in white with the letters A, C and I correspond to the ditches that have been dated using C14. Complete plan view of the excavation showing the situation of the ditches. And detail of the plough marks documented during this excavation.
Figure 10. Horizontal layout of ditch A, and close-up of the cut showing marks left behind by a tool on the rock. The material filling in ditch A was dated to 1020±30 cal BP.

Figure 11. General view of ditch C, plan view and cross section. The material filling in the ditch was dated to 230±30 BP.
Figure 12. General view of ditch I, plan view and cross section. The material filling in the ditch was dated to 800±30 BP.

Figure 13. Detail of marks left on rock from plough.
Figure 14. Aerial photograph of the area studied in the mountain range of O Xistral, showing the area where excavation work was carried out, showing the enclosure where excavation work was carried out, and illustration of the cross section showing the samples collected with the analytical results.

Figure 15. Comparison of aerial photographs from 2003 and 1956. Despite only being some 50 years apart, it is possible to see the significant changes that have affected the distribution of arable land in these hillside areas.
### Tables

<table>
<thead>
<tr>
<th>ELEMENTO AGRARIO</th>
<th>LAB.</th>
<th>C-14 BP</th>
<th>C-14 cal. AD (2s)</th>
<th>NIVEL ESTRATIGRÁFICO</th>
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Table 1. List and results of samples of concentrated organic matter dated by C14 from different agrarian elements. The conventional and calibrated dates are shown, together with their stratigraphic position.

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<th>ELEMENTO AGRARIO</th>
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<th>C-14 cal. AD (2s)</th>
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Table 2. Datings obtained in the ditches in Marco do Portovello (Guitiriz, Lugo).

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Table 3. Datings obtained in the enclosure of Coto Vello (Abadín, Lugo).