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# Down to the River: Marital Movement And Genetic Structure On The Hispanic-Portuguese Border

Thesis Submitted For The Degree Of Master Of Science (M.Sc.)  
Department of Anthropology  
University of Durham

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September 1994



- 2 JUN 1995

**Para mi abuelo Paco.**

**Este trabajo aunque humilde y en  
inglés, se lo debo a tus genes.**

## ABSTRACT

The aim of this study was to provide preliminary evidence on the impact of the River Minho on the genetic structure of the Hispanic-Portuguese populations that occupy its valley. The study was aimed to be descriptive rather than analytical, so ethnographic material was used as background information to predict the constraints imposed by the river's dual role as a political and geographic barrier.

These constraints were then examined in an analysis of marital mobility and genetic structure in the valley in an investigation which involved two stages. Firstly, information derived from dispensations and isonymy was used to understand the degree of inbreeding of the populations and underlying genetic structure. Secondly, marital migration data was used to describe the admixture of the populations in terms of extent, direction and orientation of marital movement, to provide evidence on the barriers imposed by the River Minho. Ethnographic material was used in the interpretation of results.

Results obtained point to patrilocal agricultural communities with high inbreeding, low admixture rates, high endogamy and local mate exchange where short range movement predominates. These characteristics are present in both sides of the river, regardless of national affiliation or of the presence in the Portuguese area of a growing urban centre.

Preliminary findings suggest that the River Minho may well be acting as a geographic rather than a political boundary to gene flow and genetic differentiation.

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## Declaration

I declare that material submitted for this M.Sc. thesis has not been submitted for a degree in this or any other university.

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## Chapter 1

### INTRODUCTION

The study of the genetic structure of a population encompasses the two main branches of anthropology, for it has very clearly defined social and biological aspects; the name biodemography (Abade, 1992) is attached to it to take account of this interdisciplinary nature. The term attempts to take into consideration the methodology characteristic of Historical Demography fitted into a framework provided by Population Genetics (Swedlund, 1980) to answer questions like: how did the genetic structure establish itself in the population? what evolutionary mechanisms will modify such a structure? with what genetic results? (Cavalli-Sforza and Bodmer, 1971).

In the present study, the populations of the River Minho Valley in the border area between Spain and Portugal are studied to provide answers to the questions above. The river itself has had a prominent role in the development of the genetic structures of the populations that form its valley, and that includes not only the establishment of such structures but also their modification through time. It is important that time has seen the evolution of the river itself, from a purely geographic phenomenon to a political division separating the two countries after the birth of Portugal from Spain in the twelfth century A.D. It is this dual role of the River Minho as a geographic and political boundary that encouraged the study of the genetic structure of the populations on the Hispanic-Portuguese border, for it was hoped that evidence would be provided on the effects of geography and political barriers on genetic variation (Smith et al., 1990).

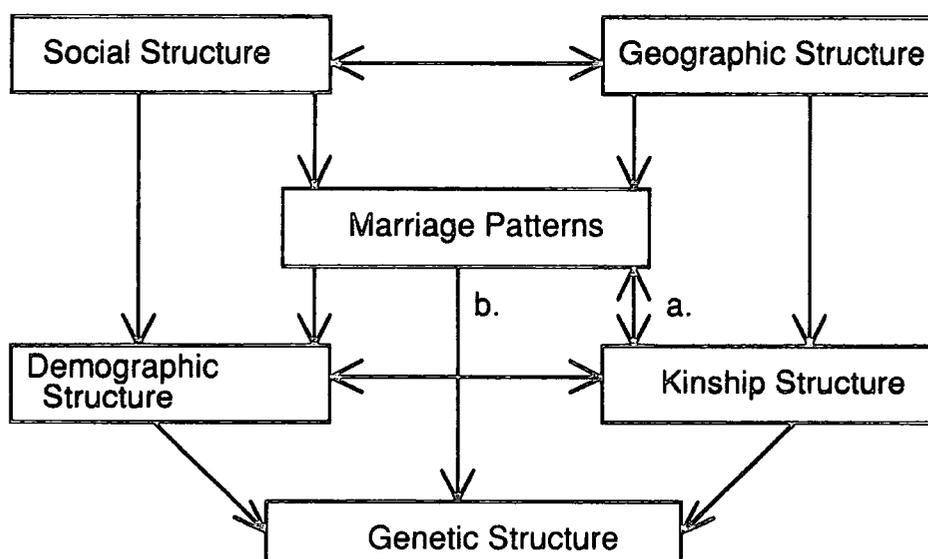
Traditionally, most work on the study of genetic structure has focussed on the part played by geography in the evolution and maintenance of genetic structure and genetic variation. Distance (Azevêdo et al. 1969; Boyce et al. 1967; Cavalli-Sforza and Bodmer 1971; Constant 1948; Coleman 1977; Kimura and Weiss 1964; Malecot 1950; Morton 1973; 1977; Swedlund 1972; Wright 1943; Zanardi et al. 1977) and population size (Cavalli-Sforza and Bodmer 1971; Dyke 1984; Relethford 1986; 1988) have, for instance, received a great deal of attention.

Modern studies still acknowledge the important role of geography on genetic structure, but they have also demonstrated that geography alone cannot explain genetic variation fully, especially at the local level. Interest has since shifted toward understanding the variety of factors which encourage regional differences in the genetic constitution of populations, based on the premise that genes are units of inheritance that can only be understood in an ecological context (Mehrai, 1984). For that reason, attention has shifted to history (Harvey et al. 1986; Relethford et al. 1981; Sherren 1987; Swedlund 1984), demography (Abade 1992; Fúster 1983; Relethford 1984), linguistics

(Barbujani et al. 1992; Falsetti and Sokal 1992) and religion (Smith et al. 1990) to explain this variation.

The recognition that there are many interrelated factors which can affect the genetic structure of populations is essential for the development of biodemography as a discipline. Cavalli-Sforza and Bodmer (1971) suggest, for instance, that a sample of humans must always be accompanied by a careful description of the population from which it originates (*ibid*, pp.39).

Figure 1.1 Factors Affecting the Genetic Structure of Populations



In the present study the model proposed by Dyke (1984) is used as the starting point to understand the relationship between the factors which affect the genetic structure of Hispanic-Portuguese populations (Figure 1.1). Ethnographic material is used in this study to provide an accurate description of the social, geographic and kinship structures which operate in the populations studied. The conditions described are used to predict the type of mating structure which is expected to operate in the region. The accuracy of the predictions made is then tested in an analysis of mating structure of the populations of the Minho River Valley which involved two stages.

The first stage evaluated the relationship between the mating and kinship structures (marked a. in Figure 1.1) in an investigation of genetic isolation of the populations studied. The second stage examined the patterns of marital mobility, an aspect of mating structure which considers three essential characteristics. First, it considers the extent of marital movement and helps to defined the breeding population. Second, it considers the space over which mating occurs, namely the distances travelled by mates and the orientation of movement. Thirdly, it describes who is moving, helping

to assess whether the migrants (movers) are representative of the populations studied. In this study the variable considered was the sex of the movers. Both a. and b. (Figure 1.1) provide evidence, therefore, on genetic structure. The interpretation of results was aided by the ethnographic material recovered.

The central position of mating structure in the diagram is due to the known importance of gene flow in microevolution and in the creation and maintenance of genetic structure. Marriage, and mating, are taken literally to mean 'gene flow', although in practice the former may not necessarily result in the latter, through, say, sterility. However, if the marriage involves two individuals who do not belong to the same population, what marriage does do is to link two genetically different areas. In doing so, it opens the *possibilities* for genetic exchange, which would reduce the genetic differences of each area. This is why gene flow is known as a 'homogeneizing' force in human evolution.

A study of marriage patterns within a mating structure will help us to understand the processes upon which eligibility of mate rests i.e. the constraints on mate choice to which the population is subject to at the time of choosing a mate. It is because they affect mate choice that these constraints will also impede, or encourage gene flow. Thus, a study of mating structure will aid in the identification of primary barriers and secondary subdivisions in populations. The fewer barriers there are, the more gene flow there will be, and a breakdown in isolation will result.

In this study we will see how the constraints imposed by socio-cultural rules and geography are, according to the ethnography, fairly similar for populations at either side of the river, regardless of national affiliation. These populations have been subject to a common history (Soares, 1875), a common demographic context (Abade 1992; Amorim 1985; Brettell 1986; Kertzer and Brettell 1987) and no language barrier (Sokal et al., 1988). Furthermore, both Galician and Portuguese populations are Catholic. These similarities are backed by very similar socio-cultural and economic attitudes, which are explained in more detail in Chapter 3.

From where then might differences between these populations arise? The aim of this thesis is to establish whether differences exist, and if they do, explain the extent to which they are attributable to the dual role of the River Minho as a political and geographic boundary to gene flow and genetic variation.

## Chapter 2

### DATA COLLECTION

#### 2.1 THE DATA SOURCES

##### 2.1.1 Primary Sources

Data for the study were derived from Roman Catholic marriage registers at the Archivo Diocesano de Tuy (data for Galician parishes) and in the Arquivo Distrital do Viana do Castelo (data for Portuguese parishes).

A total of 2854 marriages were transcribed during a period of fieldwork in the border area between Spain and Portugal in April-May 1994. Data were collected for the period January 1st 1790 to December 31st 1851 both dates inclusive, for nine parishes bordering the river. Four Galician parishes belonging to the *concello* of Arbo were considered: these comprised Arbo, Barcela, Cequeliños and Mourentán. The other five Portuguese parishes belonged to the *concelho* of Melgaço, and comprised Alvaredo, Melgaço (Villa), Paderne, Prado and Remoães.

The following variables were recorded at the time of transcription:

- 1) Date the marriage was contracted: day of the month, month of the year and year.
- 2) Two surnames for the groom and two surnames for the bride.
- 3) Legitimacy status of the bride and groom.
- 4) Marital status of the bride and groom.
- 5) Parish of birth of bride and groom.
- 6) Parish of residence at the time of marriage of the bride and groom.
- 7) Country of birth of the bride and groom.
- 8) Dispensations to marry. If the dispensation to marry was required for relationships of descent (consanguinity) or marriage (affinity) the degree of relationship was also transcribed.

##### 2.1.2 Secondary Sources

Data were also derived from the following sources:

- 1) The Bishopric Archives at the Archivo Diocesano of Tuy provided:
  - a. Eighteen *expedientes matrimoniales* (dispensation papers) covering the period 1790-1799 for the Galician parish of Arbo.
  - b. An unpublished manuscript of the year 1854 on the geography, history and ethnography of the *Obispado* of Tuy containing information on population size.
- 2) The Archivo Histórico Provincial of Pontevedra (Galicia) housed the *Catastro del Marques de la Ensenada*, a census carried out in 1753 in the whole of Spain. The

*Catastro* has information on the economy, social and geographic characteristics (including population sizes) of each of the Galician parishes.

3) The Instituto Nacional de Estadística (INE) in Madrid allowed me to consult:

- a. The 1789 *Censo de Floridablanca*, which contains information specific to each Galician parish, including population size and division of the inhabitants by age, marital status, legitimacy status and profession.
- b. The *Censo de Godoy*, which contains information on Galicia in general, with no distinction by parish, but which does provide estimates on population size.
- c. The first official census of 1857.

4) The Arquivo Nacional Torre de Tombo in Lisbon provided :

- a. *Memórias Paroquiais Do Dicionario Geográfico* by Don. Pe. Luis Cardoso. Dated at 1758 the *Memórias* are the equivalent to the 1753 *Catastro*, with information on size and general geography of the parish. They were the Portuguese response to the earthquake of 1753, to assess the damage done.
- b. The *Censo de Pina Manique*, dated end of eighteenth century and comparable to the *Censo* of *Floridablanca*.

## 2.2. MARRIAGE REGISTERS AS A DATA SOURCE

### **2.2.1 Information on Galician and Portuguese Records**

Galician registers contain a significant amount of information which can be used for genetic analysis. Bride and groom are both listed with two surnames unless they are illegitimate and only the name of the mother is known. However, if the child is illegitimate but the names of both parents are known and these could get married in the future, the child receives two surnames, but is classified in the registers as 'illegitimate-hijo natural de'.

The marital status is provided, and for widowed individuals the name and surname of the deceased spouse is also stated. One problem for entries of deceased individuals is that they sometimes do not inform on the parish or country of birth but only on the parish of residence at the time of marriage. The legitimacy status is not mentioned and problems may also arise with second and subsequent marriages, for individuals of both sexes will be sampled more than once.

All dispensations are entered if they were required, and if they were necessary for relationships of consanguinity or affinity, the exact degree was given.

Portuguese records are less complete on the whole. Two surnames are not always provided, while in some registers up to four surnames are given. The opportunities for

the Portuguese to choose the surname they wanted to give to their child means some individuals are listed by any of four surnames (two for the father and two for the mother), even if product of a legitimate union.

### 2.2.2 Using Marriage Records In Migration Analysis

In this study marriage registers were used to derive information on marital mobility, for which data on parish of birth and parish of residence at the time of marriage are needed in order to be able to account for distance travelled at the time of marriage and of the direction (orientation) of movement. Lasker (1985) acknowledged one of the basic problems of marriage records as sources of genetic information to be the failure of priests to list places of residence and birth i.e: either one or the other were mentioned but never both. Since marriages usually take place at or near the residence of the partner of one sex the population to which the other sex belongs may be inaccurately specified.

In marriage registers, the places of birth and residence at the time of marriage are not always given. If such places are not listed then one must assume that the place written down on the wedding day represents both the birthplace and the place of residence at the time of marriage. A further problem is that records are based on the village or town where the marriage was recorded, which is not necessarily the place where the couple decided to settle once married.

Although these limitations have been widely acknowledged (Jorde, 1984), the assumption that the place stated in the registers represents the birthplace of both bride and groom is accepted and widespread, and has been treated as such in many studies of genetic structure (Coleman 1977; Relethford 1986).

Whilst admitting to the limitations outlined above, and realising that marriage records will, on the whole, provide just a limited account of the total movement and gene flow within an area, I believe Galician and Portuguese records provide a fairly accurate description of exact birthplace and place of residence at the time of marriage of both bride and groom.

During transcription of the records, the term '*vecino de*' (Galicia) and '*vizinho de*' (Portugal) were encountered in the records to specify the parish (or parishes) from which the bride and groom came from.

Literally, both these terms would specify a residential condition, related therefore to place of residence at marriage, and not necessarily place of birth. However, the use of these terms in Galician and Portuguese records can, in my opinion, reflect also the place of birth.

According to Lisón Tolosana (1971) the parish is a term used for the immediate reference of its inhabitants, so that it is experienced by them as a unit and "mal veciño é o

que riñe con toda parroquia"<sup>1</sup> (op.cit. pp.62). Such an experience of unity is defined by clear migratory, demographic, economic, folkloric and customary aspects, reinforced by a strong preference for parish endogamy. A *vecino* is, from this point of view, a member of this close community who helps to perpetuate its existence so that "aquí vecinos somos todos los de la parroquia: todos los de la parroquia nos llamamos vecinos"<sup>2</sup> (ibid.).

Lisón Tolosana further relates the condition of *vecino* to geography, so that it can also be associated with descent and residential rules, and to distance "vecinos somos todos los de la parroquia, pero los más cercanos somos más vecinos"<sup>3</sup> (ibid.). In other words, the term *vecino* has two dimensions to it: one at parish level and one at village level.

That a priest should refer to a parishioner as '*vecino de*' is further supported by the need for official dispensations when any movement away from the parish had taken place, even if such a movement had been for a short period of time (Chapter 4). *Vecinos* from other parishes required such dispensations when they decided to marry in a parish other than their place of birth.

In Portuguese society, the term *vizinho* probably referred to those individuals who were permanent residents of the hamlet or parish because they owned land. In doing so, it denied rights of residence to those individuals who did not have permanent access to land. To apply this to Portuguese parishioners, would in all effect, reduce the number of *vizinhos* in a parish. Traditionally few individuals have been in a position to own land, and figures as low as 25% have been quoted (Brettell, 1986).

The need to own land in order to qualify as a *vizinho*, throws doubts on the birthplaces assigned to landless agricultural labourers, which make up the largest percentage of people. How can we be certain of their birthplace?

The answer is that we can not, but there is still a way of knowing where they came from. The Portuguese have traditionally moved around the parish of birth performing different agricultural tasks in different villages belonging to different parishes. This has created a situation in which movement abounds, but this is only short-range movement, maybe just for the day (the gravitational model by Cavalli-Sforza and Bodmer, 1971 describes how people will move during the day and return to a home base at night). When an inhabitant of a parish is defined as *vizinho* of another it probably refers to this transient condition, and residency is taken to be the place where the agricultural tasks are being performed and birthplace the place where the *vizinho* comes from.

There seems to be further support for this notion in the way some priests carefully recorded how long the 'foreigner' had been resident in the parish where the marriage was

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<sup>1</sup>"It is a bad neighbour he who argues with people in the parish".

<sup>2</sup>"Here *vecino* is a person who belongs to the parish: all the parishioners we call *vecinos*".

<sup>3</sup>"*Vecino* is everyone in the parish, but the one closer to you is more *vecino*".

contracted, and the time was specified regardless of how many months or years had gone by since the time the residence changed.

### 2.2.3 Using Marriage Records in Surname Analysis

The transmission of surnames in Spain is more regular than in Portugal. In Hispanic populations, an individual always has two surnames, the first one taken from the father and the second one from the mother. In Portuguese populations, an individual can take his or her first surname from either the mother or the father, so the order can be reversed. This means that siblings could have different surnames, with females obtaining their first name from their mothers and males from their fathers. Some individuals, and especially women, can be identified by nicknames which in most cases are related to the geographical site in the parish to which the individual belongs eg. Ana Victoria de Sao João (Amorim 1985; Brettell 1986). Some females may be identified by nothing more than by their given names and their residence eg. Maria Jesus of Outeiro.

The irregularities in Portuguese surname transmission are not necessarily detrimental to conducting surname analysis, if one considers the amount of genetic work using surnames that has been carried out in Portugal (Abade 1992; Abade et al. 1986; Rodrigues de Areia 1988; Rodrigues de Areia et al., 1986; Smith et al., 1992). In the larger Portuguese parishes, the transmission of surnames is consistent with Hispanic populations. Some cross-checking was possible for some in those parishes where the grandparents of the bride and groom were specified. Male surnames are present in every generation, the female surname being the one which is more often lost in transmission. In this study I have tried to overcome the limitations on Portuguese surname transmission by extending the surname analysis to include all of the four surnames in a couple (two for the groom and two for the bride). Thus instead of considering one isonymy, I have considered six. The methodology used is explained in the chapter on isonymy.

## 2.3 HANDLING THE DATA

The package of programs ISOonymy version 2.15 (Abade, Oct 1991) was used for the isonymy analysis. The program ISO computed the Ft, Fn and Fr values for each parish and each isonymy considered. In order to use the package, a data file was created for each parish and each isonymy which included the number of marriages, the number of populations included and the number of different surnames per marriage followed by each selected pair of surnames. Each isonymy method used required a different data file, so a total of six data files were created for each parish. Each file was then run using the program ISO. Parish Ft, Fr and Fn values were computed by averaging the values for each category using the four different isonymy values obtained.

During the preparation of the data files, duplicate cases were detected and eliminated from the isonymy analysis. Problems of polyphyletism were tackled by maintaining the spelling given by the priest i.e. leaving the surnames unmerged, and an analysis of merged surnames will be attempted in the future.

National O.S maps with scales of 1:50 000 and 1:25 000 of the areas under study were used to calculate the distances between the parishes in the study and their neighbours, which were taken as the crow flies between parish churches. It has been suggested that distances calculated in this way, especially short distances, are more representative of the actual distance travelled than distances by road (Calderón, 1983). This is specially important in an area where most of the travelling was done by foot using local accepted pathways (*caminhos*) and there was a general absence of suitable roads.

Two parameters were calculated. One was the distance between the birthplaces of the spouses. The other was the distance between the residences of the spouses at the time of marriage. The latter was also calculated as the straight line distance between the parish churches. Distances which involved parishes outside immediate measuring distance i.e. which were not in the 1:50 000 O.S. map were divided into two groups: distances which involved a movement between 25-50 km (the province of Minho for Portuguese parishes and the Dioceses of Tuy for Galician parishes), and distances which involved a movement of more than 50 km. This last group included neighbouring provinces, the rest of Spain and Portugal and other countries (there were people from Ireland and Angola, for example).

Distances were then ran on SPSS to obtain frequency distance distributions and the mean and median distances travelled (see below).

The administrative delineation of the populations was based on parish boundaries and it was this population unit which was used for the comparison of data from the two areas. This delineation can be justified because historical data in the archival centres at Tuy and Viana do Castelo is grouped into parishes, so it was convenient for me to use this level of population. Furthermore, ethnographies of Galician parishes point to a very clear delineation of population by geographic, demographic and socio-cultural characteristics (Lisón-Tolosana, 1971), and I wanted to acknowledge this fact. The limitations of such an approach are explained in Chapter 6.

In the analysis of orientation of marital movement some local terms are used which need defining here. Galician parishes are grouped into a bigger administrative unit known as *concello*. This unit is municipal, and there is a town hall in the "capital" of the *concello*. In this study, Galician parishes belonged to the *concello* of Arbo, where the town hall was set up and given independent administrative functions in 1836. A group of *concellos* makes up an *arziprestazgo* (Archbishopric) which is a religious division. The Galician parishes belonged to the *arziprestazgo* of San Martín.

In Portugal, the parishes belonged to a *concelho*. Despite the similar name, the Portuguese *concelho* is equivalent to the Galician *arziprestazgo* and not the *concello*: both are made up of broadly the same number of parishes, they are religious divisions rather than municipal ones and they occupy a similar territorial reality.

The definition of these terms is necessary for any purposes of comparison between Galician and Portuguese marriage patterns. To say that a pattern is *concelho* endogamous involves a much wider territory than one which is *concello* endogamous so without an specific description of what term means what the Portuguese would appear as less isolated than the Galician, even though this might not be the case.

In the analysis of orientation, data was lumped into fourteen categories to allow for comparison. The first nine categories involve the parishes under study: 1=Arbo, 2=Barcela, 3=Cequeliños, 4=Mourentán, 5=Alvaredo, 6=Melgaço, 7=Paderne, 8=Prado and 9=Remoães (see Figure 3.1 p. 13). The next two categories are the *concelho* of Melgaço and the *arziprestazgo* of San Martin. This was necessary in order to take into account movement from the parishes surrounding the nine parishes under study. The following two categories are 'rest of Portugal' and 'rest of Galicia'. These two territorial divisions are not strictly comparable, for the former is a country and Galicia is only a region within a country but they were used to acknowledge the movement from the rest of Spain into Galicia, which is more extensive than that of the rest of Portugal into Melgaço. Thus the category 'other' lumped together movement from the rest of Spain and from foreign countries.

## 2.4 CONTENTS OF THE STUDY

The rest of the dissertation is divided into three parts: Chapter 3, Chapters 4 and 5 and Chapter 6. Chapter 3 considers the geographic, economic and socio-cultural characteristics of the populations under study to provide a background on past migrations, affiliations of Hispanic-Portuguese populations, geographic and administrative boundaries and communication networks and issues of land inheritance and land ownership. Predictions on the effects of these geographic and cultural peculiarities on the genetic structure of Hispanic-Portuguese populations are made. The accuracy of these predictions is examined in Chapters 4 and 5. The former describes the genetic structure of the two areas (Galicia and Portugal) in terms of its genetic isolation and associated inbreeding. The latter concentrates in the way patterns of marital mobility have encouraged movement and exchange.

Chapter 6 reviews the findings obtained for Chapters 4 and 5 and assesses the extent to which the predictions made in Chapter 3 can explain these findings. It also questions the relative impacts of the River Minho as a political and geographic boundary.

Chapter 3  
THE GEOGRAPHY AND SOCIO-CULTURAL ASPECTS  
OF THE MINHO RIVER VALLEY

The significance of the River Minho as a barrier to population movement between Galicia and Portugal was realised in the twelfth century A.D. The reason was the need to defend the newly created kingdom of Portugal from invasions organized by the neighbouring kingdom of León, from which it was born in the years between 1179-1185. The need to start populating the regions north and west of the new kingdom resulted in a series of charters (*forais*) which conceded special privileges to new settlements which could grow into defence centres. This resulted in the enfranchisement of *concelhos* (municipalities) in the years which followed (1185-1211). The potential for defence of the Minho was soon realised and Melgaço received its *forais* in 1183-1185 (Soares, 1875). The Minhotan populations at the time belonged to the Diocese of Tuy, which extended as far south as the River Lima, so for all religious purposes the parishes belonged to the same head, and were governed by the same rules. Furthermore, the parishes which would form the *concelho* of Melgaço were subject to Galician control. Paderne and Alvaredo were created by the Countess of Paterna, widow of the Count of Tuy, in 1140. She conceded privileges to Galician noblemen in order to secure Galician hold of the other side of the Minho. Alvaredo was born out of Paderne, and the two parishes remained under the control of Galician noblemen until 1547. Melgaço's *forais* attracted mostly Galicians from the province of Orense. The creation of Portugal thus influenced the settling of both sides of the River Minho by both Portuguese and Galician peoples, each concerned about protection from invasion.

In the centuries that followed the creation of Portugal there were constant wars between the Spanish and the Portuguese, a result of the repeated invasions of the latter by the former. The impact of these wars for the populations around the Minho was two-fold. On the one hand, the wars helped the creation of strongholds at either side of the river. This contributed to the growth of Melgaço and of the populations around it. On the other hand, the Minho was constantly subject to gains and losses from either side, and populations belonged to Spain and Portugal alternatively. The difficulty was enhanced by the maintenance of the old boundaries as proposed by the kingdom of León, so that neither kingdom could agree as to whom had sovereign rights over the Minhotan populations.

Despite the consolidation of the Portuguese regime and its territory during the fifteenth century, wars broke out again in the sixteenth century and continued until 1668, the year in which the new Regime was assured by the Spanish. Peace did not last long, however, and in 1762-1777 Spain broke its assurance and invaded Portugal again.

It comes as no surprise therefore that the final acceptance of the River Minho as the political boundary between the Spanish kingdom of Galicia and Portugal was only agreed upon in the second half of the nineteenth century.

At the time of this study (1790-1851) the populations at either side of the Minho belonged to two different countries, but the river was not formally set as the political boundary between the two sides of the river. It would appear, therefore, that movement across the river would have been hampered by the river itself and the specific geographical features which have resulted from its course, namely the mountains that form its valley and its tributaries. However, there are also certain socio-cultural characteristics particular to the two regions which reflect their belonging to two different countries. These characteristics would have helped in the political differentiation of the area, and given the Minho the role of political boundary to population movement.

### 3.1 THE GEOGRAPHY

#### **3.1.1 The River Minho**

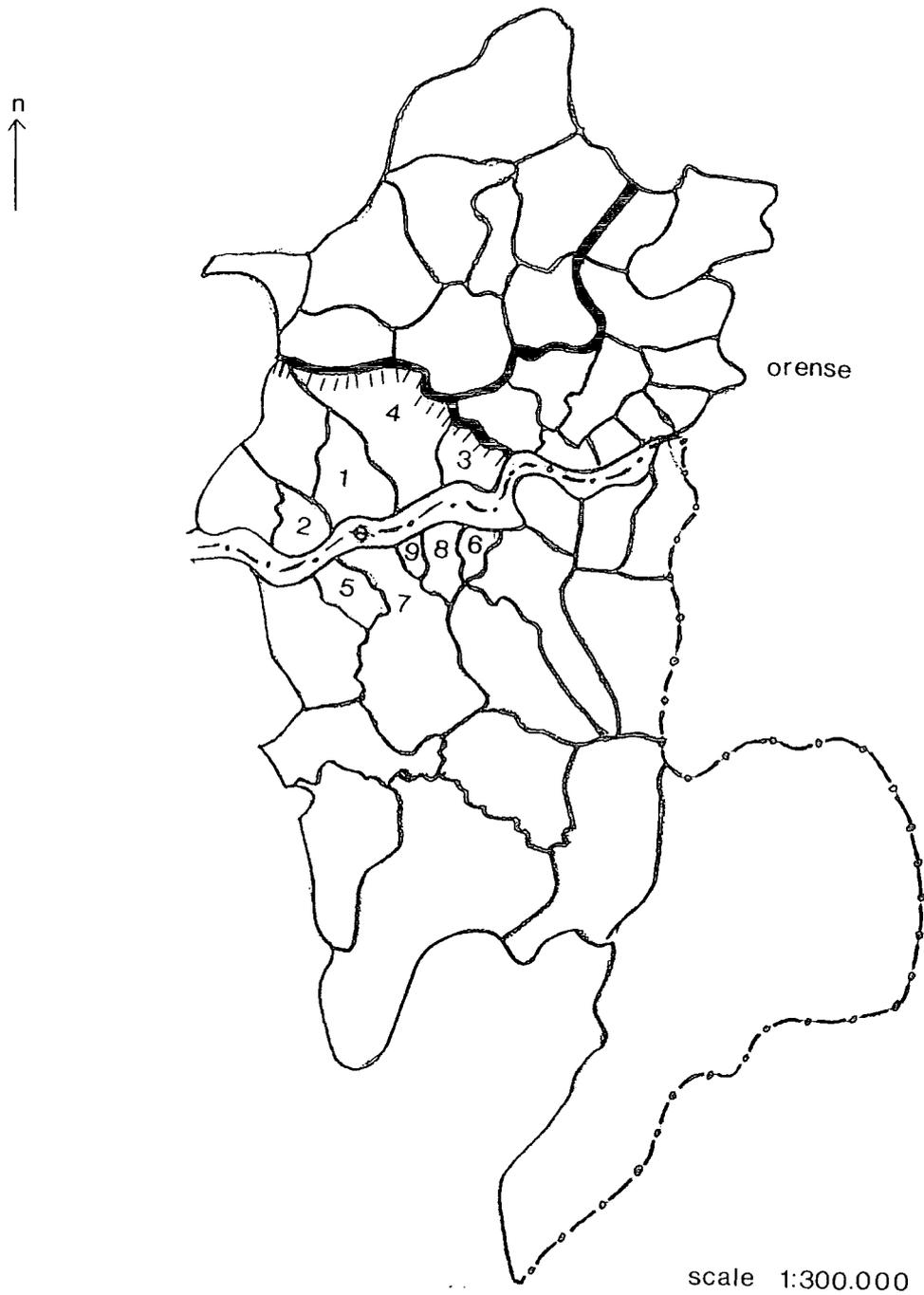
A river will only act as a physical barrier to population movement if it is not possible to cross it (Lalouel and Langaney 1976; Swedlund et al. 1984). The existence of either a ferry or a bridge between the two populations at either sides of a river will lessen the importance to the river as a barrier altogether. If there is no form of crossing, individuals would either have to cross elsewhere where there is a crossing point or not cross at all. In both cases, population movement would happen parallel to the geographic barrier (Constant, 1948).

In the present study the River Minho could be crossed locally using a 'customs' point between the parishes of Arbo (Galicia) and Paderne (Portugal). At this point the River narrows considerably, and there is a crossing of relatively shallow water over a stretch of about 500 metres. The choice of an area along the river with a crossing point was deliberate. However, despite the possibilities of crossing the river, which would reduce the importance of it as a geographical barrier, communities living along its banks may still have chosen not to cross it, in which case the political significance of the Minho could be assessed.

For example, in their study of the Bedik and Niokholonko in Senegal, Lalouel and Langaney (1976) showed how exchange between two ethnic groups ceased to happen regardless of whether or not there was a physical barrier between them, but exchange within the same ethnic group was sought along and across the river that separated the two populations. Although my two sets of populations cannot be described as two separate ethnic groups the analogy is acceptable.

Figure 3.1 The Minho River and the parishes of the *concello* of Arbo and the *concello* of Melgaço

(1=Arbo, 2=Barcela, 3=Cequeliños, 4=Mourentán, 5=Alvaredo, 6=Melgaço, 7=Paderne, 8=Prado, 9=Remoães)



The two countries can be regarded as two different entities, with the river acting to perpetuate those differences as if they were ethnically different. Because the aim of this thesis is to provide preliminary evidence on the effects of the Minho River as both a political and a geographic boundary, this approach is justifiable.

Movement between the two sets of populations would have tended to happen at the crossing point. The presence of the customs is referred to in the records, and the crossing was done by boat: the customs officer had his residence in the mixed district of Mourentán, which belonged to both the parish of the same name and Arbo. The alternative for movement was to cross the political border once this separates from the river, between the parishes of Desteriz (Orense, Galicia) and Cristoval (Minho, Portugal) (Figure 3.1), but for the inhabitants of the parishes studied this would have meant travelling a distance of more than 10 km there and 10 km back, so it seems improbable that they would have used that crossing point if they were going to settle immediately opposite their original parish.

### 3.1.2 The Mountain Range: The *concelho* of Melgaço

The valley sides are steeper on the Portuguese side, where a mountain range runs alongside the River Minho. Mean altitude is 700 metres above sea level for the *concelho* compared to a mean altitude of 105 metres for the Galician side. This has resulted in cold, windy, rainy weather and bare soils. Fertile soils are replaced by pine forests with some deciduous trees (mostly oaks and chestnuts). The less attractive location has resulted in a slightly lower population density in the Portuguese side (117 inhabitants per kilometre square in Galicia and 91 inhabitants per kilometre square in Portugal).

Populations in the Portuguese side have settled either on the river banks or up the valley. With the exception of Paderne, all other populations considered in this study are down by the river. The actual parish church of Paderne is up the mountain, situated at 340 metres, even though a small portion of the parish borders the river and it is there that the crossing point is found.

The presence of the mountain has "squashed" the Portuguese parishes between the river and the mountain, forcing parallel movement to both along an east west plane. Only the parish of Paderne has wider possibilities for travel, for inhabitants could have chosen to move down to the river, or to the other upper valley parishes. This has given it a north to south plane along which movement can occur.

The *concelho* of Melgaço is made up of eighteen parishes, but only five are considered here. These are Melgaço parish (urban centre), Alvaredo, Paderne, Prado and Remoães. All the parishes are agricultural parishes with the exception of Melgaço, which was a growing 'urban' centre at the time of the study. All the parishes border on the River Minho.

### 3.1.3 The tributaries: the *concello* of Arbo

The most important tributary of the River Minho in the area considered is the River Deva, which separates the four Galician parishes into two blocks: Arbo, Barcela and Mourentán on the west and Cequeliños on the east. All the parishes border the Minho and are situated immediately opposite the Portuguese parishes in the study.

The four parishes in the study into were divided into two blocks separated by the River Deva until 1835 (i.e. half way through the study period). After 1835 the four parishes were united to form, together with the parishes of Sela and Cabeiras, the *concello* of Arbo, a municipal division with its centre placed at Arbo itself. Before the unification of the area, the parishes west of the Deva River (Arbo, Barcela and Mourentán) belonged to the Count of Salvatierra but the parishes east of the Deva (Cequeliños) belonged to the Marques de Salvatierra, and was controlled by the *concello* centre at Crecente and not at Arbo.

The importance of this tributary has been described elsewhere (Jamarda, 1993); it must have been sufficiently important to justify the construction of a bridge (Ponte de Deva) between the parishes of Arbo and Mourentán during Roman times. The bridge remains the only way to cross the river between the communities studied.

Arbo, Barcela and Cequeliños had a very restricted movement on an east-west plane: in a west to east direction for the parishes east of the Deva and an east to west direction for the parishes west of the Deva. The valley of the River Deva itself would have allowed movement in a northerly direction or a north-south axis, and the parish of Mourentán situated in the valley of the Deva is in a privileged position to exchange migrants with the populations north of the Minho. All movement into the other parishes from the north would have had to go past Mourentán and down the valley of the Deva.

### 3.1.4 Crossing the Minho: Connections between Galicia and Northern Portugal

The provinces of Galicia and Minho have been connected since Roman times, when a military and civil route was created between Tuy (Galicia) and Braga (Portugal). The crossing between Tuy and Valença do Minho (Portugal) has existed since then (Pina-Cabral, 1986). Once in Valença it is possible to travel either west to Viana do Castelo, the most important centre for emigration in the province of Minho during the nineteenth and early twentieth centuries, or east to Melgaço, an increasingly important urban centre after the fourteenth century and since 1364 the town controlling trade from Portugal to Galicia (Soares, 1875).

Axes of movement between Galicia and Portugal were either through the Roman road at Tuy and Valença or the medieval road through Melgaço to the Galician province of Orense i.e. movement happened along the river in an east-west plane. For normal

parishioners not engaged in trading, the crossing point between the parishes of Arbo (Galicia) and Paderne (Portugal) could have been another important crossing point of the river. There was no railway until the late nineteenth century, so we must assume that all movement was done by road using either the *caminhos* (see below) or the *carreiros* (ordinary tracks- see Pina-Cabral, 1986:146-149).

## 3.2. SOCIO-CULTURAL CHARACTERISTICS

### 3.2.1 Land Inheritance

In both Spain and Portugal a tendency for partibility, a system of inheritance under which all children are heirs to the parental patrimony has been described. A distinction is made between the *legítima* (a portion of the total property which has to be divided equally among all heirs) and the *terço* (Portugal) or *tercio* (Galicia) which is a third of the property given only to one child. The recipients of this third are said to be '*mejorado/a*' which literally means they have been 'improved'. In practice any child can be improved, and the *terço* is given to males or females - normally the child to receive it is the one who then takes care of the parents until they die.

Different forms of *terço* designation under a system of partible inheritance have been described for Minho (Portugal) and Galicia (Spain).

For Portugal, Brettell (1986) described a situation in which women are the favoured heirs of the third share, this being prompted by the acute absence of males from the parish through emigration. Such an absence would make it unproductive to favour a male. Pina-Cabral's (1986) study of two Minhotan parishes confirmed the above findings, and he made a distinction between the property near the household, which is kept intact and handed over to a daughter, and that in more outlying regions, which is subject to division amongst all offspring.

Lisón Tolosana (1971) acknowledges two types of *tercio*: one for males and one for females (as in the Portuguese example). Males are more likely to inherit the *tercio* in mountainous areas, where they can receive up to two-thirds of the total estate of the parents and an equal share of the remaining third, which is divided equally among all offspring. Such a situation would be encountered in the province of Pontevedra so it is relevant to the Galician parishes under study. Females are more likely to inherit the *tercio* in coastal areas, where they are bequeathed the house and the field as well as an equal share in the remainder of the property.

These two types of inheritance - one in which a male inherits and the other in which a female inherits - have an effect on the types of residence enforced upon the community. In a situation in which a male inherits, males will stay in the parish of birth

and they will bring their brides home, giving way to a system of patrilocal residence and patrilineal transmission of rights. In the Portuguese parishes, however, the females stay at home and bring in their husbands. An matrilocal form of residence will result with a matrilineal transmission of rights.

The contribution of females to the economy of the household (Bentley, 1992) in both Galicia and Portugal has given rise to a third form of residence known as natolocal residence. This residence pattern has been described for both Galicia (Lisón Tolosana 1971) and Portugal (Abade 1992; Pais de Brito 1977 in O'Neill 1987; O'Neill 1987), and precedes the designation of the *terço* or *tercio* for men or women.

Natolocal residence is the result of equal weighting attached to production and reproduction, men and women both being required for the economic development of the household. To create a new household after marriage is unthinkable, it would be 'economic suicide' (O'Neill, 1987). Instead, males and females remain in their respective houses after marriage, and it is the wife's household which acts as the unit of reproduction. The man will sleep there but will leave at dawn to work for his parents' household. This situation continues until either of the spouses inherits, so it merely reflects the conditions prior to inheritance. Natolocal residence can occur parallel to patrilocal or matrilocal residence patterns.

### 3.2.2 Land Ownership

The differences in land inheritance patterns outlined have been prompted by differences in patterns of land ownership for Galicia and Portugal.

At the time of the study (1790-1851), the Galician parishes considered belonged to the nobility, to the Count of Salvatierra to whom the parishioners had to pay tenancy rights in order to be able to work the land (*Catastro del Marques de la Ensenada*, 1753). Cequeliños was owned by a different nobleman to whom the parishioners did not have to pay tenancy rights. Villages owned no common land, and out of their own harvest they had to pay a tithe to the Church. There were no *jornaleros*- individuals who worked the land exclusively on a daily basis, as such, although peasants still used that name to classify themselves. Instead parishioners worked the land to which they were entitled as if it were theirs as hereditary tenants. Money to pay the tithe and the rent was derived from three harvests per year: one of maize and one of linen in the dry season, and a combined one of maize and rye in the rainy season.

The lack of land ownership, and the possibilities of losing rights to use land through movement, would have discouraged mobility among parishioners, in particular of the elderly, women and children and the male heirs. Movement away from the parish would only be undertaken if absolutely necessary, i.e. in a year of a bad harvest, when second and subsequent sons would have been involved in seasonal migrations in order to

raise a supplementary income to help their village and household (see below for details). Patterns of land ownership in Galicia would have resulted in genetic isolation, increased consanguinity and inbreeding and genetic differentiation through enforced parish endogamy.

In Portugal the *caseiros* were under a similar tenancy agreement to that of the Galician *jornalero*. The *caseiros* were sharecroppers (normally disinherited offspring) who made a living working the lands of the ennobled families in the region in an effort to find stability in agriculture and land to settle on permanently.

The number of *caseiros* was much smaller than in Galicia. Most of the parishioners were *jornaleiros* and *arrendeiros* proper i.e. individuals who owned no land whatsoever and who made a living working for others for daily wages. Most of the *jornaleiro* families would have a small plot of land with a house, where they would grow vegetables (cabbage, lettuce, turnips etc), but never enough land for crop harvesting.

There was always enough land to work on for the *jornaleiros*. The Church was the most important property owner at the time, and the villagers could lease land from the Church if they could pay for it. The parishioners who decided to do so would be engaged in a tenancy agreement similar to that of their Galician neighbours. After the 1830s, buying land from the Church became possible in both Portugal and Galicia, and it seems probable that the families who had traditionally worked such land would have wanted to buy it, but would have had to emigrated overseas to acquire the money. However, while overseas, either the Church may have already sold the land to somebody else or the emigrants may have chosen not to return at all. Alternatively, the landless peasants would work the land of the *lavradores*, the land holding peasants, who made up a small percentage of the population. In the Alto Minho in 1864, only 24.5% peasants owned their own land (Brettell, 1986). Property was divided into very small plots, which could be scattered around either in the native village or in the neighbouring villages, regardless of parish boundaries. Even large properties became small plots of land, for they were divided into small parcels and rented out to the landless peasant farmers who could afford it.

It is clear that, at the turn of the nineteenth century, different forms of land ownership in Galicia and Portugal had given rise to two different situations at either side of the Minho. The Portuguese peasants were much more mobile even if within a short range, for although they still had a home base, they would work lands which could be situated away from their own hamlet, village or even parish. The availability of land to work was indeed a pull for a wide range of peasants in the region, and helped to break down the parish boundaries, presumably increasing parish exogamy. It is worth pointing out that movement would have had to be fairly localised, since the peasants still had to return to their own home base after their working day. In other words, the pattern of land

ownership in Portugal resembles the conditions of the Gravitational Model proposed by Cavalli-Sforza and Bodmer (1971), which assumes movement around a home base to which people return to at night. Such movement would have aided in the development of neighbourhood knowledge and the possibilities for short-range pre-marital movement over strict localised parish endogamy (see below).

### 3.3.3 Possible Implications of Land Ownership and Land Inheritance Patterns on Genetic Structure in Galicia and Portugal

The importance of the natolocal residence in genetic terms is that it will enforce parish endogamy and short range movement, due to the need for the two households to be close to each other and easily accesible. Distances between households will have to be short and the range of movement reduced as a result.

If the mate is chosen from one's own parish, then the designation of the *terço* or *tercio* to either males or females (patrilineal or matrilineal inheritance) will affect the genetic structure of the population by increasing the amount of inbreeding and genetic isolation through parish endogamy. If the mate is sought for outside the parish in a patrilocal society, women will be the main agents of gene flow, for a woman will be the one to bring in new genes into a parish, and the women from the parish will be taking their genes elsewhere. In a matrilocal society the roles will be reversed, and males will be the main agents of gene flow.

The effects of males or females moving will depend upon how far they move. Distant places will provide individuals whose genetic constitution is likely to be more different to that of the local population than an individual from a nearby parish. The further away an individual comes from, therefore, the more different the genes that he or she provides will be. If there are any differences in the distances travelled by males and females, then the form of residence which attracts the agents from furthest away will result in less genetic isolation. Since there is a difference between male and female movement in both Galician and Portuguese populations (see below), inheritance is important when considering genetic differentiation. Those areas with matrilocal residence will be less genetically isolated, since men move further than women.

### 3.3.4 Possibilities for Motion: Migratory Movements in Galicia and Portugal

Migratory movements of one form or another have been a fundamental part of both Galician and Minhotan populations regardless of the system of inheritance which prevailed (Kertzer and Brettell, 1987).

### 3.3.4.1 Short Range Movement: Neighbourhood knowledge

The neighbourhood knowledge model defines the frequency with which surrounding populations are visited by members of a home village (Swedlund, 1972), and ultimately which mates are chosen from these populations (Boyce et al, 1967). The aim of the model is to understand the dynamics of genetic interchange between populations, which can be best understood through an analysis of movement patterns, since movement of people allows for gene flow.

The frequency of visits is dependent on the general characteristics of human behaviour and on the ability to travel between populations.

The implications of "having a home base" will be different for Galicia and Portugal and these have been explained above. The importance of short range movement is important for the two regions, but in different ways. Thus while in Galicia the home base will increase the importance of parish endogamy and local movement, in Portugal the boundaries between parishes will be relaxed and the concepts of endogamy and short distance made more flexible.

The two households must also be easily accessible to each other. In the past the accessibility was made possible by the existence of *caminhos*, literally 'pathways' which were the only accepted lines of travel. These *caminhos* were used for all community rituals (weddings, births and burials) and rituals of parish and hamlet unity, so that they have been important for the association between social units and specific stretches of land (Pina-Cabral, 1989). That such traditional pathways were the only axes of movement accepted created a strong opposition toward the introduction into peasant communities of paved roads. This means peasant communities in Galicia and Portugal have been relatively isolated from the outside. Most movement along these accepted routes must have been short range, and so extremely localised.

Evidence in support for the peasant dislike of modern paved roads dates back to the mid 1800s, when peasant populations of the Minho region were involved in the Maria da Fonte Revolution of 1846. The revolution was started by peasant women in the Alto Minho when the government attempted to introduce a set of laws to open the rural areas to capitalist development, and laws included road building. Although the element which finally set the revolution off were the laws enforcing construction of cemeteries, the opposition against road construction remained.

The reluctance on the part of local populations to accept the introduction of paved roads, would have had the effect of lowering the accessibility of the population (Lalouel and Langaney, 1976) increasing its genetic isolation. Such attitudes were by no means uncommon in historical populations, and Swedlund (1972) describes how neighbourhood knowledge was dependent on selective migration along preferred direction of travel in a

comparative study of Otmoor villages and the village of Deerfield in historical Massachusetts.

The presence of the River Minho would have had the effect of stopping movement on a north-south plane (southwards for the Galicians, northwards for the Portuguese).

However, the crossing point between the parishes of Paderne and Arbo could have made this type of exchange a bit easier. It has already been pointed out by Pais de Brito in 1977 (cited in O'Neill, 1987), that natolocal residence existed over the political border separating the parishes of Rio de Onor (Tras-Os-Montes, Portugal) and Rihonor de Castilla (Spain). Exchange over a political border is therefore theoretically possible. However the Minho is also a river, and the river still acts as a geographic barrier, impeding movement. The only way to overcome this impediment would have been to use the crossing point.

#### 3.3.4.2 *Temporary Movement: Seasonal Migration*

Up to two-thirds of total movement in Galicia during the eighteenth and nineteenth centuries was temporary, involving the members of the communities who were not expected to inherit on "work pilgrimages" (Meijide Pardo, 1960) or "harvest migrations" (Bauer, 1983) undertaken for agricultural reasons. This type of movement is not only particular to Galicia. In northern Portugal most seasonal movement was to the southern parts of the country, where the migrants were known as *ratinhos* (Brettell, 1986).

Temporary movement by Galicians took the form of local labour migration within the sphere of agriculture involving seasonal movements regulated by the succession of harvests. Groups of migrants would leave their villages in March to return in August and September with enough supplementary income to survive the winter months (Bauer 1983; Ettema 1980; Meijide Pardo 1960). Seasonal movement was kin-structured, with "harvest crews" (Bauer, 1983) being formed by males of the same family. These crews followed the same circuit of employers each year along well established routes (presumably the *caminhos*) and by foot.

Galician temporary migration started in the sixteenth century and was primarily to Portugal, to communities close to the border in the Minho, where they would help in the vintages. There were large numbers of men involved in these seasonal migrations. The periodicity of migration to Portugal involved, by the early eighteenth century, 30,000 people. The numbers rose during the century- in the mid eighteenth century there were 60,000 Galicians in the Minho, mostly from the province of Orense, and by 1800 the number had risen to 80,000 (Gándara Feijoo, 1971). The proportion of Galician migrants to Minho continued to be high until the late nineteenth century, when movement into Minho was replaced to a certain extent by permanent emigration to Latin America.

These Galician migrants in Minho were known as *galegos* (Brettell, 1986), an awkward term to compare them with the *brasileiros*, the Portuguese migrants who went to Brazil to make money only to return back to Portugal and buy their own land. Strictly speaking, the two terms are not comparable. The *brasileiro* went abroad on his own and after making the money might or might not come back to Portugal. The *galego* went to Minho in a group, and the purpose was to make enough money to return to his village and be able to spend the winter months with a monetary supplement. The presence of *galegos* is significant and confirms there must have been a large number of individuals who chose to move into Minho seasonally. This type of movement would have helped in the breakdown of isolation of the Galician parishes in the study and aided in the development of neighbourhood knowledge between parishes immediately opposite the river, which would have facilitated exchange across the Minho.

On reaching Minho, some males could have chosen not to go back to their villages, but to marry locally instead. The "harvest crews" referred to above were made up primarily of males whose hope of inheriting was thwarted by their position in the family i.e. they were minor heirs who would only inherit a small part of their family's patrimony. The eldest sons, or putative major heirs, those who would receive the *terço* or *tercio*, would stay in their local villages. Because the possibilities of buying land in Portugal at the time were greater than in Spain, where the parishes belonged to the nobility, it would come as no surprise that these minor heirs would choose to stay in Portugal. They could then either marry a female heir or make enough money to build their own house.

Two conclusions can be drawn up from the peculiarities of Galician seasonal migration. Firstly, the males are moving further away than the females, who are remaining in their native villages where they are involved in the productive process. Males are therefore more important agents of gene flow in the sense that they are moving further away, contributing new, different genes to that of the local populations. Secondly, the fact that the males involved are not heirs to a big proportion of the parental patrimony means that if they do marry a local Portuguese woman they may not move back to their native village at all. In other words the pre-marital movement will be all the movement they undertake. The possibility they may not move any more would make the seasonal movement of the Galicians genetically important, for marital distance would be equivalent to genetic distance. By contrast, if the Galician involved in seasonal migration married away from his birthplace and took his bride back home with him, this would help in the breakdown of the genetic isolation of his parish- in a system of patrilocal residence seasonal migration could therefore also have strong genetic implications.

There is another type of temporary migration undertaken by the Galicians which could potentially have had a much stronger genetic effect. This was cyclical migration

(Meijide Pardo, 1960), which involved the movement of men to the urban centres of the province of Entre Douro e Minho (basically Braga, Guimarães and Porto) and to Lisbon. The period of stay in the urban centres varied from three to five years, and individuals would undertake this form of migration several times during their life time until they reached the fifty years of age. There is demographic evidence to support this movement; in 1748 there were 45,000 Galicians in Lisbon, making up an eighth of the city's population, and the Galicians contributed to the growth of Porto, which doubled its population between 1730 and 1790 (Meijide Pardo, 1960). It seems that this type of movement was undertaken for the same reasons as seasonal movement, namely to make enough money to return to the parish of birth. However, the labour involvement was not agricultural but industrial, into textile factories, fisheries and iron foundries (Bauer, 1983). Temporary migration was also important because it involved women as well as men, who went to urban centres to be employed as wet nurses and as servants in houses. In temporary migration then both men and women would act as agents of gene flow.

The seasonality of Portuguese movement is different to that of the Galicians whilst retaining some of the peculiarities of this type of migration. Whilst in the Galician case all non-inheriting males in a village would move temporarily, only the poorest members of the Portuguese villages would be involved in these seasonal "work pilgrimages" (Meijide Pardo, 1960): these individuals would be landless *jornaleiros* and *caseiros*. Until the eighteenth century the movement was local, and the males involved in these migrations would perform the same agricultural tasks in different parishes which were geographically close to each other. Such movement was solitary and not in groups made up of related male kin, despite the fact that those males involved would never inherit (as in the Galician case), but it was also undertaken for agricultural reasons (Brettell, 1986).

The parishioner who had access to his or her own land would not be involved in this seasonal movement. Members of a land-holding family who were not to inherit would help in agricultural tasks in surrounding parishes, but then the movement would be gravitational, as described above, and would involve returning to the home base for the evening.

There was also some movement into Spain but most movement was to the southern parts of the country (*ratinhos*). Movement into Galicia resembled the movement into Portugal undertaken by the Galicians, but the Portuguese male who married a local Galician female would most probably return to Portugal. The reason for this is three-fold. The Galician female would not necessarily inherit if movement occurred into one of the Galician parishes under study, although this would depend on where in Galicia the Portuguese found himself to be. The temptation to stay in the parish would therefore be diminished. Secondly, the fact that neither the migrant nor the local have any possibilities

of inheriting could mean that they chose to move around performing different agricultural tasks in different parishes, maybe until the birth of their first son or daughter. In other words there could be some post-marital movement, resting genetic importance to pre-marital movement undertaken for the latter type of movement would be exclusively for marriage, and would not have involved gene flow. Finally, because the Portuguese at the time could buy land and this was not possible in Galicia at the time considered, the couple could choose to return to Portugal. In this case the women would be important agents of gene flow.

#### *3.3.4.3 Permanent Movement: Emigration*

Temporary migration from Spain to Portugal and vice versa was important in demographic terms for both countries. The authorities at the time realised this, and tried to tackle it through the introduction of restrictive emigration laws in both Galicia (Meijide Pardo, 1960) and Portugal (Brettell, 1986) in the eighteenth and nineteenth centuries. Emigration overseas at that time represented a small proportion of the population, and only one-third of the total number of Galicians were engaged in emigration to Latin America (op.cit.) in the years up to the 1750s. After then, emigration becomes increasingly important, although with no significant demographic consequences for Galicia (Dopico, 1992) until the mid nineteenth century; by then 31% of males had emigrated to America (ibid. pp.). Villares (1992) argues that the surge of emigration after the 1850s was due to the finishing of the privileges of the nobility and the chance for peasants to own land (ibid.pp. 252), for peasants would have had to go abroad to procure the money. Of those who left the country on an exodus to America 40% were urban dwellers and 18% were semi-urban dwellers (Rey Castelao, 1992a); the peasant population was engaged primarily on seasonal migration. Peasant families who did go overseas were normally very poor families who joined the programs of repopulation of the Patagonia introduced by Charles III in 1778-1784 (Rey Castelao, 1992b). Portuguese emigration to Brazil and other Latin American countries only started to be significant after the discovery of gold in Brazil during the eighteenth century, although the biggest impact was during the period between 1870 and 1914 (Brettell, 1986). It was then that Galician emigration to Brazil started as well, but those Galicians who chose to go overseas to Brazil stayed in Portugal prior to their departure (Rey Castelao, 1992a). The time period considered in this study predates the surge in permanent emigration, so it shall not be considered in any detail here, although it is necessary to sketch the basic outline of this type of migration. It is necessary however to provide some detail on this type of migration.

Permanent emigration at the turn of the eighteenth century was predominantly a male affair. The involvement of females in the production process allowed for the

existence of this type of movement in two complementary ways. Firstly, because women were involved in the labour force, men were able to leave knowing that the production process would remain unaltered. For those who wanted to return leaving the female members of the family behind meant they would have something to work for and return to. Secondly, permanent emigration is a male affair so inheritance in predominantly emigrating areas has tended to fall on the female who stays behind. The link between emigration and matrilocality has been outlined elsewhere (Brettell 1986; Kertzer and Brettell 1987). Here it is perhaps sufficient to stress the possibility for the females to inherit would have prompted male movement overseas in an effort to make enough money in order to return and buy some land of their own. However, the link between female inheritance and permanent emigration, although plausible, seems to me a bit of a chicken and egg situation and deciding which came first appears a difficult task. Brettell herself (ibid. p.263) suggests emigration was a means to preserve small inheritances and obtain a supplementary income as a result of partibility laws during the nineteenth century. This would describe the situation after my study period, so female inheritance would be seen to post date emigration.

If this is so, then it would be plausible to assume that the inheritance at the time of my study was patrilineal with a *terço* designation for men and patrilocal residence, a system which would maintain women as the important agents of gene flow. The exception to the rule would be a parish where emigration was important enough to justify matrilineal inheritance and matrilocality residence.

Permanent emigration would have reduced total nuptiality of each parish. For those women left behind who wanted to marry, inhabitants from other parishes would have been made attractive, so that emigration would have had the effect of increasing the amount of female local movement to find a mate, improving neighbourhood knowledge and reducing genetic isolation.

### **3.3 SUMMARY**

In the light of these data it appears that the geographic and socio-cultural characteristics of the Minho River valley have created the potential for both genetic isolation and admixture.

This circumstance is peculiar for admixture and isolation represent two opposing circumstances. The rest of this study will provide evidence to help us decide which of the two is most characteristic of the two areas, and whether the two areas are so similar they represent a region. The extent of genetic isolation of the parishes in this study is examined in a study of inbreeding derived from dispensations and isonymy (Chapter 4). The possibilities and extent of admixture and subsequent breakdown of genetic isolation are then examined in a study of pre-marital movement: its extent, its orientation and the

distances travelled (Chapter 5). The investigation in both these chapters is intended as descriptive rather than analytical and integrates the ethnographic material outlined in this chapter in the interpretation of results.

## Chapter 4

### INBREEDING AND ISOLATION

"Hear me in silence. My daughter and my nephew are formed for each other. They are descended on the maternal side, from the same noble line: and, on the father's, from respectable, honourable and ancient, though untitled families. Their fortune on both sides is splendid. They are destined for each other by the voice of every member of their respective families."

(Jane Austen, *Pride and Prejudice* 1813)

A mating between two individuals who are related to another by descent from a common ancestor is known as a consanguineous mating. The offspring of such a union is designated as inbred and the incidence and degree of consanguinity among all marriages may be used to estimate the mean inbreeding coefficient of a population (Cavalli-Sforza and Bodmer 1971; Mange and Mange 1980).

Most societies or populations have some kind of opinion and action regarding marriage to a relative, and the excerpt above shows how in early nineteenth century England marrying a relative was influenced by social class and associated monetary power. In Mediterranean societies, of Catholic beliefs, marriage to a relative has been very much controlled by the Catholic Church, which established prohibitions on marriage between relatives in the thirteenth century. Goody (1983) suggests these prohibitions were calculated ploys of a church determined to become rich and powerful at the expense of the laity. Dispensations had to be purchased, so prohibitions on marriage to relatives helped in the economic development of the Church.

The prohibitions of the Catholic Church exemplify the way external factors can affect panmixia (random mating). Although in every population there will be relatives who can be considered as potential mates in terms of age and marital status, there will also be rules which will either encourage or prohibit such a mating.

Estimating the mean inbreeding of a population will allow us to understand its degree of genetic isolation. Such isolation is a result of a variety of factors: demographic, social, economic and geographic, which have either encouraged or deterred both endogamy and matings between relatives. In this way inbreeding helps to understand better the pressures on mate choice suffered by a population. The aim of this chapter is to describe the inbreeding levels of the individual parishes studied and of the parishes combined into two areas, Galicia and Portugal, and to try and account for the factors which have resulted in such levels.

The degree of inbreeding was calculated using Roman Catholic dispensations in a consanguinity analysis (Abade 1983:1992; Abade et al. 1986; Calderón 1983:1989; Fúster 1983; McCullough and O'Rourke 1986; Pettener 1985; Pinto-Cisternas and Moroni 1967; Valls 1960:1967; Smith et al. 1992) and surnames of the bride and groom in a marital isonymy analysis (Abade et al. 1986; Crow and Mange 1965; Ellis and Friedl 1976; Ellis and Starmer 1978; Lasker 1980:1985; Lafranchi et al. 1988; Pinto-Cisternas et al 1985; Robinson 1983; Weiss et al. 1983).

Dispensations inform us not only of the mean inbreeding of the population ( $\alpha$ ) but also on the contributions of the different degrees of relationship to the total i.e. what sort of matings between relatives are taking place. Based on the assumption that first cousin marriage represents 'desired' consanguinity as opposed to the 'suffered' consanguinity in second and third cousin marriage (Calderón,1989) analysing the contribution of the different degrees of relationship to mean inbreeding can help to identify the factors which prompt inbreeding. Thus, whilst second and third cousin marriage represent random inbreeding which is suffered by a population because of its isolation (geographic or otherwise) 'desired' (non-random) consanguinity (first cousin marriage) results from a combination of demographic, social and economic factors, with geography playing a less important part in its occurrence.

There is another type of analysis which is used to judge whether a preference to marry relatives exists in a population. This is marital isonymy analysis, which estimates inbreeding using identity of surnames of bride and groom as its data source. Originally described by Crow and Mange (1965) it has since then been slightly modified and perfected (Crow 1980; Yasuda and Furusho 1971). In their original paper, Crow and Mange (op.cit.) made it clear that isonymy analysis should be used in studies of genetic structure because it was developed with the purpose of assessing the social, economic, demographic and environmental factors which condition the patterns of genetic exchange. Such an approach is intended in this essay, as has been already pointed out.

Isonymy describes the total inbreeding of a population ( $F_t$ ) and can be divided into two components: random ( $F_r$ ) and non-random ( $F_n$ ). The random component depends exclusively on the distribution of surnames within a population and is independent of the selective choice of mates (preference or avoidance of consanguineous matings) or population subdivision. In that way it reflects the population structure of the population considered, basically its size and the accumulated effects of inbreeding and previous migration as shown by the underlying distribution of surnames. The smaller the size, the more chances there are to marry someone who is related to you. In large populations the incidence of isonymous marriages will also be higher than that expected by chance alone (Abade 1992; Coleman 1977- this is explained in more detail below). Through time, random inbreeding will lead to a loss of genetic variation if the population remains

isolated from the outside, but as isolation decreases through an increase in exogamy, the random component of inbreeding will also decrease. This is due to the introduction of new surnames into the population, and a consequent increase in heterozygosity.

The non-random component of isonymy reflects the preference or reluctance to marry relatives and can be either positive or negative. A positive  $F_n$  is obtained when there is a preference to marry relatives; a negative value reflects the contrary i.e. reluctance to marry relatives. Non-random inbreeding estimated from isonymy is a reflection of the extent to which consanguinity is "sought" or avoided by a population.

## 4.1 CONSANGUINITY ANALYSIS

### **4.1.1 Introduction**

Most data on inbreeding in Hispanic-Portuguese populations have been traditionally derived from the dispensations required by the Roman Catholic Church to marry a close relative (Abade 1983:1992; Abade et al. 1986; Calderón 1983:1989; Fúster 1983; Pinto-Cisternas and Moroni 1967; Valls 1960:1967; Smith et al. 1992).

The use of dispensations to calculate mean inbreeding coefficients is widely accepted, even though there is general consensus that the figures obtained underestimate inbreeding by ignoring those relationships beyond proscription and the occasional ignorance of proscribed relationships on the part of the bride and groom (Robinson 1983; Smith et al. 1993<sup>1</sup>).

The requirement by the Roman Catholic Church to obtain dispensations in order to marry a close relative, dates from the Council of Trent in the sixteenth century (1542-1563). From then on, and until 1911, all relationships up to fourth degree of relationship had to obtain a church dispensation, so parish priests have systematically recorded all consanguineous marriages up to and including third cousin. These prohibitions were reduced to second cousin in the years 1911-1960, and since 1960 only first cousins have needed dispensations to marry (Pettener, 1985).

During the sixteenth and seventeenth centuries inbreeding levels were rather low (McCullough and O'Rourke 1986; Pettener 1985), and they remained low during the 1700s and early 1800s, increasing after 1850 and declining again after the 1920s. The time period considered in this study, 1790-1851, begins therefore in the plateau of the eighteenth century, with levels starting to increase toward the end of the period.

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<sup>1</sup>Smith et al., 1993 argue part of the reason why dispensations do not reflect fully the extent of inbreeding within an area is because dispensations had to be purchased, and common people could not afford it. This would have led people to marry without advising on the relationship between them to avoid payment.

The following data, derived from the Bishopric Archives at Tuy (*expedientes matrimoniales*) throw a light on the circumstances under which a dispensation was needed to marry.

At the time of asking for a dispensation for either a relationship by descent (consanguinity) or by marriage (affinity) the couple had to specify whether they had had intercourse, for this required a special dispensation. If there had been intercourse and it was declared at the time of soliciting the dispensation for consanguinity or affinity, a separate dispensation for incest was granted and the couple had to go through their penance. The penance was devised by the priest. After a popular mass in which the bride and groom were married barefooted and with wax in their hands, the couple had to continue with their penance for a further six months. The incest was absolved and the children legitimized.

If copulation was not admitted the marriage could be annulled altogether and the couple separated. In one case a couple asked only for a dispensation for the relationship by marriage which existed between the two, without admitting to having had intercourse. Six months later when the bride gave birth to a boy, the marriage was annulled and the couple separated for two years before they were granted a joint dispensation for marriage and incest and the legitimation of the boy.

"Abandoned *namoradas*" (Brettell's term to designate those Portuguese women who after engagement had been left by their emigrating fiancées, 1986) also needed special dispensations to marry a man other than their known fiancé, even if the man in question had long since left and nobody knew of his destination or if he was alive. A bride, after her engagement in 1781 and the obtaining of the Three Canonic Amonestations required by the Council of Trent to marry, the groom had left and was still away by 1788 when she had the opportunity to marry a widower. Because she 'belonged' to somebody else she had to ask for a dispensation to marry the widower even although they were not actually related. The dispensation took two more years to come, and she eventually married her second suitor.

Movement away from the country was carefully recorded and those Galician grooms who had been absent in Portugal or serving their conscription outside the province needed a special dispensation to marry, which would testify to their status as single individuals. This dispensation was needed regardless of the amount of time the groom had been away, but the longer the absence the longer the dispensation took to be granted. A groom who had been in Lisbon for two years and three months had to wait three years until he could marry.

Grooms who met the opposition of the father of the bride needed to ask for a special dispensation which would allow them to marry, a dispensation which granted them a position in society. In one case a groom had to appeal continually for one year and

five months before he was finally granted the dispensation to marry his bride, whose father opposed the marriage even on the day of the wedding, as it appears on the actual marriage entry.

In a context of high illegitimate births it was easy for a mother to claim whom she wanted as the father of her child. In such cases the implicated male could ask for a dispensation not to marry that woman and legitimise the child if he thought or knew that he was not the father of the child in question. After careful consideration a dispensation was granted which testified to the non-paternity of the male, but again these considerations were difficult to obtain. One man obtained such a dispensation only two years after he asked for it, when the woman bringing the paternity suit married somebody else.

#### 4.1.2 Materials and Methods

##### 4.1.2.1 Theory

Data for the analysis were obtained from Roman Catholic dispensations which appear in marriage registers. Although data on consanguinity derived from ecclesiastical dispensations underestimates inbreeding (Bittles 1990; Robinson 1983; Smith et al. 1993), some authors (e.g. Calderón 1989) have suggested that the information derived from dispensations for Iberian populations is both exact and reliable, for marriages celebrated are almost totally Catholic. This would certainly appear to be true when we consider the time period involved (1790-1851). An argument which could combine the two opinions would be that dispensations provide incomplete data as to absolute inbreeding levels; but that the data that we do have in the records is exact and reliable, and can be used for consanguinity analysis. The best estimate of the inbreeding coefficient is probably somewhere between values derived from consanguinity analysis and those derived from isonymy analysis, approaching the latter value (Robinson, 1983)

A total of 234 dispensations were recorded for the nine parishes in the period 1790-1851, 55 of which involved consanguineous matings up to the third degree (second cousin). In addition a total of 18 *expedientes of marriage* were obtained for the parish of Arbo covering the period 1790-1799, which help us obtain a clearer picture as to what it was like to get married in the late eighteenth century (see above, section 4.1.1).

Information contained in dispensations regarding degrees of relationship was used for the computation of the average inbreeding coefficient  $\alpha$  derived by Bernstein (Jacquard 1974; Wright 1951).

According to Bernstein, the mean coefficient of inbreeding of a population can be defined as:

$$\alpha = \sum p_i F_i$$

were  $p_i$  is the frequency of inbred individuals with coefficient  $F_i$ .  $F_i$  is calculated from the degree of relationship between the two individuals. Thus, if the bride and groom are first cousins  $F_i$  will be 0.0625.  $F_i$  is multiplied by the number of couples who are also first cousins and added to other  $F_i$  values obtained for other degrees of relationship. The total is then divided by the number of marriages in the population.

#### *4.1.2.2 Aims*

In the present study, the consanguinity analysis has been applied in four different but complementary ways:

**4.1.2.2.1 Frequency of Consanguineous Marriages.** By studying the frequency of consanguineous matings in relation to total marriages contracted it becomes possible to identify deviations from random mating (panmixia). It is an analysis complementary to the analysis of endogamy, and helps identify frequencies which are either too high or too low i.e. different from those which should be expected under normal conditions (Fúster 1983).

These fluctuations in the frequencies of consanguineous matings have been interpreted as deviations from panmixia in a number of studies. Consanguinity frequency has been presented as having a very strong socio-cultural component to its occurrence, be this land inheritance (Calderón 1983:1989; Cavalli Sforza and Bodmer 1971; Fúster 1983; Pettener 1985; Smith et al 1992; Valls 1967); sex ratio imbalance; illegitimacy (Abade 1992; Fúster 1983), emigration (Abade et al 1986) or nuptiality (Fúster, 1983).

#### **4.1.2.2.2 Distribution of the Different Types of Consanguineous Marriages.**

Frequency of consanguineous matings is not, by itself, a good indicator of the degree of inbreeding, because the latter depends on the distribution of the different types of the consanguineous marriages contracted.

In order to overcome this limitation, the degree of relationship for each consanguineous mating has to be recorded up to fourth degree (third cousin), and the contribution of each type of mating to the total frequency distribution and the inbreeding coefficient then assessed. Ultimately this represents the system of mating under which the population operates (Hajnal, 1963) e.g.: two populations may be found to have different consanguinity frequencies but similar inbreeding coefficients and it is necessary not only to distinguish between the two but also to try and explain why these differences may be so. Hajnal's systems of mating were classified according to extent of population growth and migration. By considering migration, this type of analysis will also inform us on the degree of genetic isolation of the subpopulations which form the study.

**4.1.2.2.3 Mean Inbreeding Coefficient ( $\alpha$ ).** Calculating the mean inbreeding coefficient ( $\alpha$ ) will allow us to relate consanguinity frequency with degrees of relationship.

On the basis of previous research, high  $\alpha$  values are expected. Mc Cullough and O'Rourke (1986) observed Southern Europe to have higher than average  $\alpha$  values for European populations, and this view has been substantiated by studies specific to Spain and Portugal.

Spain has been described as having the highest  $\alpha$  values in Europe (Pinto-Cisternas and Moroni 1967; Calderón 1989). Within Spain, Galicia has been described as the area with the highest inbreeding, even if consanguinity frequency values are similar to other Iberian regions (Fúster 1983; Valls 1967).

Values for Portuguese populations are expected to be lower than for Spanish populations (Valls, 1967), but still higher, on average, than other European populations. Data for Portugal is less abundant than in Spain, but high  $\alpha$  values have been reported both in the mainland (Abade 1983; Abade et al 1986; Abade 1992; Rodrigues de Areia et al 1987) and in the Azores (Smith et al 1992). Abade (1992) quotes frequency consanguinity and inbreeding values for the parishes around Bragança, in northeast Portugal, above those expected for Portugal as a whole and higher than results for Galician populations reported by Valls (1967) and Fúster (1983).

**4.1.2.2.4 Pre-Marital Movement in Consanguineous Marriages.** An analysis of the contribution of pre-marital movement to consanguinity will inform us on which types of matings are most likely to occur, and will help explain the inbreeding values obtained and distinguish between random and non random inbreeding.

### **4.1.3 Results**

#### **4.1.3.1 Consanguinity Frequency Up To Fourth Degree of Relationship**

The differences between Portugal and Galicia are remarkable when consanguinity frequency including fourth degree of relationship (third cousins) is considered (Table 4.1). Frequency values make Galician parishes look highly isolated in comparison to their Portuguese neighbours. Only one of the Portuguese parishes, Prado, has a frequency of consanguinity which approaches any of the Galician parishes.

Barcela appears as the most isolated parish. It is followed closely by Cequeliños but this is almost expected if one takes into account population size. The medium size of the two parishes would reduce the amount of potential mates who are not related, a situation which would be made worse if there was any emigration i.e. although the parishes are big enough to be endogamous (Dyke, 1984), they are still smaller than other parishes, so the chances of marrying a relative are greater than in the larger parishes.

**Table 4.1 Total Marriages (T.M), Consanguineous Marriages (C.M) and Degrees of Relationship Including Fouth Degree and Multiple Consanguinity (M.C)**

Parish	T.M	C.M	%	Degrees of Relationship						M.C
				I	II	II-III	III	III-IV	IV	
Arbo	565	73	12.92	1	5	1	6	16	40	4
Barcela	211	33	15.63	-	-	-	2	8	22	1
Cequeliños	161	23	14.28	-	1	-	6	3	10	3
Mourentán	644	50	7.76	-	-	1	9	6	31	2
Alvaredo	243	8	3.29	-	3	-	-	1	4	-
Melgaço	216	1	0.46	-	-	1	-	-	-	-
Paderne	650	31	4.77	-	7	-	8	2	13	1
Prado	99	9	9.09	-	-	-	2	1	6	-
Remoães	65	3	4.61	-	-	1	-	2	-	-
Galicia	1581	179	11.32	1	6	2	23	33	105	9
Portugal	1273	52	4.08	-	10	2	10	6	23	1

When the relative frequencies of the different types of consanguineous matings are considered for Galicia (Table 4.2), the tendency for third cousins to marry is confirmed, since they make up 58.6% of the total consanguineous matings contracted, with frequencies remaining rather constant throughout the period studied.

It is worth noticing that the total number of consanguineous matings decreases with time, which could reflect a breakdown of isolation. The increase in the percent contribution of first cousin marriage is significant, denoting a preference which could well be linked to land inheritance (see below), even though the absolute contribution to consanguinity remains low (3.6%). It is even more significant to see that the percent contribution of such matings increases as the total number of consanguineous matings decreases, which adds more weight to the suggestion that matings between relatives was being favoured.

The contribution of first and second cousin marriage to percent consanguinity is much higher in the Portuguese parishes (Table 4.3), and the effect of both combined is close to the total contribution of third cousin marriage.

As in Galicia, the tendency to marry first cousins increases with time, while the tendency to marry second and third cousins decreases. Unlike in Galicia, the total number

of consanguineous matings in the Portuguese parishes does not decrease with time but instead remains rather constant with a slight increase. On the Galician side the decrease in total consanguineous matings is no doubt related to a breakdown in isolation, whilst on the Portuguese side, the constancy involved in marrying relatives suggests constancy in the environment i.e. there is more evident temporal change in socio-economic and cultural factors in Galicia than in Portugal. The reasons why such differences should exist between the two areas are explained below.

**Table 4.2 Absolute and Relative Frequencies of the Different Types of Consanguineous Matings in Ten-Year Cohorts: GALICIA**

Period	I		II		II-III		III		III-IV		IV		MM		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
1780-1800			1	2.7			7	18.5	7	18.5	20	52.6	3	7.9	38	100
1801-1810			2	3.7			2	3.7	9	16.7	38	70.4	3	5.5	54	100
1811-1820			2	5.3	2	5.3	8	21.1	3	7.8	23	60.5			38	100
1821-1830	1	5.0					3	15.0	5	25.0	9	45.0			20	100
1831-1840							2	11.8	7	41.2	7	41.2	2	10.0	17	100
1841-1851			1	8.3			1	8.3	2	16.7	8	66.7	1	5.8	12	100
Total	1	5.0	6	3.6	2	1.1	23	12.8	33	18.4	105	58.6	9	5.0	179	100

**Table 4.3 Absolute and Relative Frequencies of the Different Types of Consanguineous Matings in Ten-Year Cohorts: PORTUGAL**

Period	I		II		II-III		III		III-IV		IV		MM		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
1790-1800							2	22.2	2	22.2	5	55.6			9	100
1801-1810					2	100									2	100
1811-1820			1	12.5			2	25.0	1	12.5	4	50.0			8	100
1821-1830							3	37.5			5	62.5			8	100
1831-1840			3	30.0			1	10.0	1	10.0	4	40.0	1	10.0	10	100
1841-1851			6	42.8			2	14.3	2	14.3	4	28.6			14	100
Total			10	19.3	2	3.8	10	19.3	6	11.5	23	44.2	1	19.6	52	100

#### 4.1.3.2 Consanguinity Frequency Up To Third Degree of Relationship

By excluding fourth degree of relationship from an analysis of consanguinity frequency (Table 4.4), the differences between Galicia and Portugal are significantly reduced and homogenized; this refers to both parish values and total values for each area.

Values have a limited span, 0.92%-2.30% with only Cequeliños providing a value which is high and which lies outside the main range (4.35%). Because Cequeliños also presented high frequency values in analysis 4.1.3.1 above, the breeding isolation of this parish in relation to the rest appears to be confirmed.

Table 4.4 Total Marriages (T.M), Consanguineous Marriages (C.M), Consanguinity Frequency (%) and Degrees of Relationship Up To The Third Degree

Parish	T.M	C.M	%	Degrees of Relationship			
				I	II	II-III	III
Arbo	565	13	2.30	1	5	1	6
Barcela	211	2	0.95	-	-	-	2
Cequeliños	161	7	4.35	-	1	-	6
Mourentán	644	10	1.55	-	-	-	9
Alvaredo	243	3	1.23	-	3	-	-
Melgaço	216	2	0.92	-	-	1	-
Paderne	650	15	2.31	-	7	-	8
Prado	99	2	2.02	-	-	-	2
Remoães	65	1	1.54	-	-	1	-
Galicia	1578	32	2.02	1	6	2	23
Portugal	1273	22	1.72	-	10	2	10

The result obtained for Barcela (0.95%) is surprisingly low, especially since it showed the highest frequency value (15.63%) when all degrees of relationship were considered. Only III-IV(second cousin once removed) and IV (third cousins) degrees are really contributing to consanguinity frequency, which suggests random inbreeding makes up most of the total inbreeding of the parish. The fact that only two marriages were contracted between second cousins and there were no marriages between first cousins lends some weight to the conclusion. The low values for Barcela could also point to a conscious effort to avoid consanguineous matings altogether, and negative values for F<sub>n</sub> in isonymy analysis would confirm this (see section 4.2.3.3).

The frequency for Melgaço is close to that for Barcela (0.92% and 0.46% respectively). This is strange, especially because they represent two different economic systems: the 'urban' versus the 'rural'. One plausible explanation could be that the frequency for Melgaço is due to chance, because of the limited number of marriages contracted.

The values quoted for the other parishes, both in Galicia and in Portugal are very consistent with the frequencies obtained when all degrees of relationship were considered.

Average values for Galicia and Portugal are similar to values published for Spain and Portugal: high in comparison to other European countries, with values for Spain slightly higher than those for Portugal (Valls, 1967).

If Melgaço is excluded from the analysis, the two areas become even more homogenous (Table 4.5). This exclusion can be justified because of the 'urban' nature of the parish, whilst all the other parishes are agricultural, and so factors such as land inheritance would not be operating in Melgaço whilst they would be doing so in the rural areas. The area frequency without Melgaço is in line with frequencies quoted for Mediterranean countries (McCullough and O'Rourke 1986; Valls 1967).

**Table 4.5 Contribution of First and Second Cousin Marriage to Consanguinity Frequency (%) for Galicia and Portugal with (a) and without (b) Melgaço**

		T.M	C.M	%	Degrees of Relationship			
					I	II	II-III	III
Galicia		1581	32	2.02	1	6	2	23
Portugal	(a)	1273	22	1.72	-	10	2	10
	(b)	1057	21	1.99	-	10	1	10
Area	(a)	2854	54	1.89	1	16	4	33
	(b)	2638	52	1.97	1	13	3	36

When the two areas are considered together as a 'region', then the data fit with the expectations set by other studies on consanguinity in Galicia and Portugal: high consanguinity frequencies with a strong contribution of first and second cousin marriage to average inbreeding levels ( $\alpha$ ). I find this interesting because it masks the real results obtained for Galicia, which show how the high consanguinity frequencies are not obtained by a predominance of first and second cousin marriage, but rather by second cousin once removed and third cousin marriage. Considering the two areas as a region has the effect of making them look more similar than they really are.

#### 4.1.3.3 Inbreeding Coefficients (Table 4.6)

##### 4.1.3.3.1 Galicia

When relationships up to fourth degree are included  $\alpha$  values show an increase in all of the Galician parishes. There appear to be two distinct groups: Arbo and Cequelíños

represent the 'closed' parishes and Barcela and Mourentán the 'open' parishes. This distinction appears unrelated to population size.

Table 4.6 Total Number of Marriages (T.M), Consanguineous Marriages (C.M), Consanguinity Frequency (%) and Inbreeding Coefficient ( $\alpha$ )

Parish	T.M	Relationship Up to 4th degree (Third Cousins)			Relationship up to 3rd degree (Second Cousins)		
		C.M	%	$\alpha \times 10^{-5}$	C.M	%	$\alpha \times 10^{-5}$
Arbo	565	73	12.92	149.31	13	2.30	99.55
Barcela	211	33	15.63	85.11	2	0.95	14.78
Cequeliños	161	23	14.28	266.77	7	4.35	96.95
Mourentán	644	50	7.76	52.71	10	1.55	26.66
Alvaredo	243	9	3.29	86.79	3	1.23	77.16
Melgaço	216	1	0.46	14.49	1	0.46	14.49
Paderne	650	32	4.92	96.72	15	2.31	86.5
Prado	99	9	9.09	63.03	2	2.02	31.51
Remoães	65	3	4.61	72.15	1	1.54	48.15
Galicia	1581	179	11.32	72.58	32	2.02	58.39
Portugal	1273	55	4.32	188.52	23	1.80	162.23

Arbo and Cequeliños show high consanguinity frequencies regardless of the degree of relationship considered, and  $\alpha$  values which are higher than in any other parish and above the Galician average. It would appear, therefore, that these two are the most isolated parishes. The reason why Cequeliños should be more isolated than the other parishes could be related to land inheritance, since it is the only parish in the Galician side which does not exist under conditions of *vasallaje* (under which the inhabitants of the parish pay tenancy to the Count of Salvatierra to use his land), which would have given the inhabitants of Cequeliños the chance to buy land. Under the system of partible inheritance which has been described, marriage to a relative (especially marriage between first cousins) would have been introduced as a strategy to keep land within the family, and would explain the higher inbreeding levels of the parish. The lack of first cousin marriage for the parish suggests these events did not in fact happen: its higher inbreeding levels could reflect its smaller population size when compared to the other (Galician and Portuguese) parishes. Perhaps the higher inbreeding for the parish reflects the patterns of land ownership in another way. If parishioners had the opportunity to buy land, the high

inbreeding could be the result of male emigration undertaken to increase income in order to be in a position in which land could be bought. Emigration would have had the effect of lowering the effective size of the population, increasing the possibilities for drift and increasing inbreeding.

The reason why Arbo should appear as so highly inbred is difficult to explain. Arbo's central position in relation to the rest of the *concello* and the introduction of the *Diputación* (Town Hall) in 1836 would have been conducive to exchange by increasing the contacts with the outside and improving the contacts with the parishes that belonged to the *concello*. The presence of the crossing point to Portugal would have opened the possibility of exchange with the Portuguese parishes. In my opinion, the results for Arbo could illustrate the potential for members of the mixed village of Mourentán to register births and marriages in either Arbo or Mourentán. High consanguineous values could be the result of the choice of consanguineous couples to marry in Arbo; if Arbo was such an important municipal and religious centre, being the capital of the *concello*, maybe the granting of dispensations was quicker. This would have been especially important if the couple needed also a dispensation for incest to legitimise their children.

Barcela shows the lowest inbreeding value when only relationships up to third degree are considered which confirms Barcela's place as the least inbred and most open parish of the Galician area.

#### 4.1.3.3.2 Portugal

Portuguese parishes also show an increase in  $\alpha$  values if all degrees of relationship are considered, but, overall, the inbreeding values for the two types of analyses are more constant in the Portuguese than in Galician parishes. This means that first and second cousin marriage (second and third degree of relationship) are contributing more to the total inbreeding coefficient in Portugal than in Spain.

The values obtained for Paderne are in line with the values for Arbo and Cequeliños if relationship up to third degree is considered, but the contribution of matings up to second cousin to the total inbreeding coefficient is bigger in Paderne than in either of the Galician parishes. This makes Paderne the most genetically isolated parish of the area for both Galicia and Portugal combined.

Ironically, Paderne's position as the most inbred parish could reflect its large population size (in the manner described by Dyke, 1984). Despite large exogamy and an advantageous position, the parish still has high inbreeding levels. A plausible suggestion is that the parish was mostly a provider of migrants for the neighbouring parishes, but not actually a receiver of migrants. In other words, migrants may have chosen to marry in Paderne but then moved after the marriage, so that they contributed nothing to the breakdown of genetic isolation of the parish.

#### 4.1.3.3.3 Galicia and Portugal

Values for Galicia and Portugal support the conclusion that with very similar consanguinity frequencies when matings up to second cousin are considered, the Portuguese parishes are more inbred. Although consanguinity frequency is much lower in Portugal than in Spain when matings up to fourth degree of relationship are concerned, the inbreeding coefficient is still higher for Portugal than for Spain. The higher mean inbreeding coefficients for Portugal are due to a greater contribution of first and second cousin marriage to the mean inbreeding coefficient (Table 4.6), and reflect the preference on the part of the Portuguese to marry close blood relatives in comparison to their Galician neighbours. The argument holds even when Melgaço is considered, which, although an urban centre in its expanding period offering a pull for both short and long range movement still has an inbreeding coefficient comparable to its neighbours. The difficult transportation despite the main road to Monção and from there to Viana would have aided in the isolation of Portuguese parishes and in their genetic microdifferentiation.

#### 4.1.3.4 Consanguinity and Pre-Marital Migration (Table 4.7)

**Table 4.7 Consanguinity and Pre-Marital Migration: Proportion of Consanguineous Marriages Involving Pre-Marital Movement (PMM). Range in Kilometres and Contribution to the Percentage of the Different Degrees of Relationship**

Area	CM	PMM	% <sup>2</sup>	Range	I	II	II-III	III	III-IV	IV	MM
Galicia	79	13	16	0-11.1			8%	31%	8%	46%	8%
Portugal	52	12	23	0-7.3		25%		8%		67%	

#### 4.1.3.4.1 Galicia

In Galicia relatives lived in fairly close geographical proximity, mostly in the same parish; marrying a relative thus involved little if any pre-marital movement. The percent of consanguineous matings involving some pre-marital movement varies between parishes, but this type of analysis verifies what has already been described.

Arbo and Cequeliños have the lowest percentages of consanguineous marriages involving some pre-marital movement (total pre-marital migration accounting for 1% and

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<sup>2</sup>The percentage refers to the proportion of consanguineous marriages involving some pre-marital migration e.g. in Galicia 16% of consanguineous marriages involved pre-marital migration.

9% of total consanguineous marriages respectively) suggesting relatives lived within the parish. This fits in with the description of the two parishes as isolated, which would have increased parish endogamy and reduced movement away from the parish, and localization of relatives.

Mourentán and Barcela have higher percentages of consanguineous marriages involving some pre-marital movement. 12% of the consanguineous marriages in Mourentán involved some pre-marital movement; furthermore, the range of distance moved by Mourentán parishioners in order to marry a relative is remarkable, with two of the marriages involving long-range movement, one 11,100 km away and the other to the Galician capital, Santiago. Although Barcela also has the same contribution of pre-marital migration to consanguinity levels as Mourentán (12%), the distance travelled by the mates is more limited than that travelled by parishioners from Mourentán. Most of the movement is intensely local, to neighbouring parishes and there is no long-range movement.

Mourentán is higher up the mountain range than the other study parishes and thus has access to the populations on the other side of the mountain range including La Cañiza, an important municipal centre on the main road between Vigo/Tuy and Orense. One wonders whether Mourentán's situation has aided in the breakdown of its isolation (Chapter 5).

#### **4.1.3.4.2 Portugal**

Only two of the Portuguese parishes experience any pre-marital movement for consanguineous couples, with kin marriages in Alvaredo, Melgaço and Remoães all being parish endogamous. In the case of Alvaredo and Remoães, this conclusion is consistent with their having the highest  $\alpha$  values.

Paderne appeared highly isolated when inbreeding values and consanguinity frequency were considered, and as such the contribution of pre-marital movement is remarkable. There is a high percentage of pre-marital movement in relation to consanguineous matings in Paderne (29%), but it is worth noticing that 33% of that involves movement between first cousins. Non-random inbreeding is therefore expected to make a significant contribution to total inbreeding values. Pre-marital movement involved in first cousin marriage indicates consanguineous marriage by choice: couples will overcome geographical barriers, including distances of up to 7.3 km in order to marry a relative.

#### **4.1.3.4.3 Galicia and Portugal Compared**

The differences between Galician and Portuguese parishes are still apparent when the contribution of pre-marital migration to consanguinity levels is considered. For

Portuguese parishes more consanguineous marriages involve pre-marital migration. This suggests that in Portugal consanguineous marriage is desirable and deliberately attained. The fact that 25% of the total pre-marital movement in consanguineous marriages involves couples who are first cousins supports this statement. In Galicia there was no pre-marital movement among spouses who were first cousins although there was some second and third cousin marriage.

The preference for marrying kin among the Portuguese can also be deduced from the strong tendency to move in order to marry third cousins: 67% third cousin marriage involved some kind of pre-marital movement. However, the fact that most third cousin marriage in Galicia involves no movement at all (60%), seems to suggest once again the random inbreeding of the Galician parishes. 60% of third cousin marriages take place in Arbo, which I have described as the isolated parish par excellence, and maybe this contributes significantly to the inbreeding levels of Galicia as a whole.

The range of movement is slightly lower in Portugal and as a result is more localised, which throws a light as to the general isolation of the parishes in the *concelho* of Melgaço with respect to the rest of Portugal- the more extensive range of movement by the Galicians seems to point to less isolation of the parishes to the rest of Galicia.

#### 4.1.4 Discussion

Portuguese data fit better with published results (see McCullough and O'Rourke, 1986 for a summary): low frequencies of consanguineous matings and a high contribution of first and second cousin marriages to general inbreeding. The consanguinity frequency of 4.32% fits in well with frequencies quoted for other European countries (McCullough and O'Rourke 1986; Pettener 1985), as does the frequency of 1.80% when only matings up to the third degree of relationship are considered (Valls, 1967). Data for Galicia fits in with the predictions only if consanguinity frequency is considered, since this is very high when compared to European standards regardless of the sort of analysis undertaken as regards degrees of relationship (11.32% for up to fourth degree and 2.02% for up to third degree). However, the contribution of first and second cousin marriage to the total inbreeding coefficient is not what has been described, and in fact is much lower than expected for Spain (Calderón 1983:1989; Pinto-Cisternas and Moroni 1967) and for Galicia (Fúster 1983; Valls 1967). When compared to data for Portugal the contribution is extremely low, and we must look for reasons for these differences.

Emphasis has been placed in the literature in favour of land inheritance as a contributor to high inbreeding values because it encourages first cousin marriage. Although this could indeed have had an effect on Galician populations, the studies which testify to this describe populations in the post 1850 period, which is after my study period (1790-1851). Fúster (1983) for instance, considers Galician populations in the 1870-

1970 period, when an increase in inbreeding values is expected after 1850 (McCullough and O'Rourke 1986; Pettener 1985), following a trough in inbreeding values during the eighteenth and early nineteenth centuries and following the abolition of primogeniture in Napoleonic law and the possibilities of buying land from the church. Although the Napoleonic period has been mentioned as important for the abolition of primogeniture in favour of partible inheritance (Cavalli-Sforza and Bodmer 1971), this only started to have an effect on Galician populations after 1809. The Mendizabal decrees which were implemented in Spain to make it easier for the rural populations to purchase farming properties previously in the possession of religious orders could also have had an important effect on consanguinity increase (Calderón, 1989). However, these decrees were only introduced in 1836.

It is important to bear in mind that during the time period considered in this study (1790-1851), the Galician parishes belonged to the Count of Salvatierra to whom the parishioners had to pay tenancy rights. Even if the Napoleonic reforms of 1809 or the Mendizabal decrees of 1836 increased the potential for parishioners to buy their own land the effects of land inheritance on consanguinity increase still had not shown. This relationship is based on the premise that partible inheritance would reduce the size of the plots of land until they are so small that they cease to be adequate. It is in order to prevent this from happening that first cousin marriage is favoured, for it would join small plots of land together and maintain the productivity of the land. The fact that total number of first cousin marriages increased by 1841 at the same time as total number of consanguineous marriages decreased, could reflect new possibilities for buying land and the implementation of first cousin marriage as a strategy to keep the land within the land holding family (Rodrigues de Areia et al., 1986). Such a situation is possible, especially because by 1870, Fúster (1983) already noticed a significant contribution of first cousin marriage to total consanguinity levels.

The Portuguese, however, stand in a more privileged position as far as ownership of land is concerned. Although the introduction of partible inheritance in 1867<sup>3</sup> was later than in the Galician parishes, the Portuguese have always been able to own land. The Portuguese parishes considered in this study did not belong at the time to an aristocrat, and the parishioners did not have to pay tenancy rights. Although the possibility for buying land existed, the amount of landholders in Minho has always been small, and figures of only 24.5% of the population being land-holding *jornaleros* have been quoted (Brettell, 1986). It would come as no surprise therefore that those families who indeed held land would be eager to keep it under their control (Rodrigues de Areia et al., 1986), and a mating structure which favoured marrying relatives, who also held land inherited

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<sup>3</sup>Brettell, 1986 suggests it was the Civil Code introduced for the Minho in 1867 which would have increased the possibilities for buying land for the landless *jornaleros*.

from a common ancestor, would be preferred. This would have the effect of increasing the inbreeding coefficient of the population.

A distinction can be made between first cousin and more remote cousin marriage, therefore. First cousin marriage reflects deviation from random mating because it is used as a strategy for an ultimate purpose i.e: there is a means to an end, that is, it is related to socio-economic or cultural factors such as land inheritance.

Emigration along kinship lines has also been put forward as a factor which would have contributed to the proportion of second and third cousin marriage. Temporary movements for the Galician and Portuguese have been described in Chapter 2 as happening along kinship lines (*galegos* and *ratinhos* for Galicia and Portugal respectively).

The effects of selective migration along kinship lines on the genetic structure of a population have received a lot of attention (Brennan 1981; Collins 1976; Fix 1978; Hiorns 1984; Smith and Sherren 1989; Swedlund 1984). One possible effect of such migration would be to deprive a population from a whole family's set of genes altogether, decreasing the amount of genetic variability and increasing the chances of marrying a relative, which would in turn increase the consanguinity of a population.

The contribution of migratory movements (especially emigration) to inbreeding remains open to debate, however (Fúster, 1983), and although some authors argue that it would increase the level of inbreeding by reducing the number of potential mates (which is what I am suggesting myself), others argue that emigration results in a geographical separation of kin, which would have the effect of reducing total inbreeding values. The latter suggestion seems to me difficult to sustain in the light of kin structured migration as described for both Galician and Portuguese populations (Chapter 3). Otherwise, why should traditionally migrating populations such as the Galician and the Portuguese have the highest inbreeding levels quoted for the whole of Europe with Galicia having the highest inbreeding levels in the whole of Spain?

The tendency and preference for parish endogamy would probably have contributed to inbreeding levels. It was difficult for individuals to marry out of their own parishes, because for men it meant having to pay for their bride to her parishioners. A woman who was courting a man from another parish could see her rendezvous with her lover and even her wedding boycotted by her parishioners (Lisón Tolosana, 1971). This type of situation has also been described for a Upper Valley populations in Bologna, Italy (Pettener 1985), as contributing to inbreeding, since preceding an exogamous marriage the way to the village was barred with logs and payment was demanded from the bridegroom to let the bride leave the community (ibid.p.284).

It would come as no surprise for these socio-economic attitudes to affect the incidence of inbreeding in a significant way, and I believe they contributed to the high values outlined above.

## 4.2 ISONYMY ANALYSIS

### 4.2.1 Introduction

Isonymy literally means possession of the same surname but in studies of genetic structure it is taken to signify the proportion with which this occurs. George Darwin was the first to consider identity of surname as an indicator of genetic relationships, by estimating the frequency of first cousin marriages from the proportion of isonymous unions. However, it was not until Crow and Mange (1965) that a formula for estimating marital isonymy was put forward and applied to the Hutterites, a religious isolate. The concept has since then received worldwide attention: it was revised by Yasuda and Furusho (1971) and Crow (1980), used to derive other relationships (Koertvelyessi et al. 1992; Lasker 1967; Lasker 1978; Lasker 1980; Lasker and Kaplan 1985; Mascie-Taylor et al. 1987; Relethford 1992) and applied to a range of populations including Iberian and Latin American (Abade 1992; Diaz et al. 1987; Dipierri et al. 1991; Fúster 1986; Pinto-Cisternas et al. 1985), French (Crogner 1985), Italian (Kaplan et al. 1978) and English-speaking (Lafranchi et al. 1988; Pollitzer et al. 1988; Relethford 1982; Robinson 1983; Smith and Hudson 1984; Smith et al. 1990) populations.

The use of surnames in studies of genetic structure is based on the assumption that surnames are quasi-genetic markers which are inherited as genes are. Each surname is thus an allele at a single polymorphic locus. Possession of the same surname indicates, therefore, identity by descent from a common ancestor, and isonymy can then be used to estimate inbreeding. Three assumptions are inherent in this analogy:

- a. surnames are hereditary
- b. the relationship through the male line must be proportional to that through the female line (i.e. migration for the two sexes must be equal),
- c. surnames are monophyletic i.e. they have only one origin.

One limitation to the hereditary nature of surnames in Portugal lies in the creation of some surnames depending on the parish of birth, especially for migrating women (Brettell, 1986). In such cases, women adopt the name of the place they are from e.g. Maria Xose da Fuente. Surnames may also be invented for foundlings and illegitimate children- until 1908 in Galicia, for example, the surname '*exposito*' which literally means foundling, was given to most abandoned babies. Mothers could also choose to give whatever surname they chose to their illegitimate children with an unknown father. Most mothers in Galicia chose to give their maiden name to their child, and in cases when the mothers were legitimate children themselves, the passing on of the surname can still be

considered as Y-linked, even though it skipped a generation. This is encouraging, for it adds credibility to the analysis of isonymy.

Proportionality of migration in both sexes will be invalidated if there is any tendency towards female migration (i.e. they marry in their own parish but then they move to the male's parish), for this surnames will be distributed according to where the males live (Kaplan et al., 1978). The occurrence of patrilocality will be most likely if there is any tendency for males to inherit land. It is necessary therefore to consider isonymy in a wider context in which descent and residence are important (Smith and Sherren, 1987). The description of natal residence for the populations studied encourages the use of isonymy in two ways. Firstly, because by encouraging parish endogamy and short range movement keeps male and female movement fairly equal. Secondly, because it precedes actual *terço* (*tercio*) designation and thus patrilocal or matrilocal residence patterns.

Problems regarding monophyletism are exacerbated when the phonetics and the spelling of surnames is different. This problem, though present in British populations, should not be so bad in Hispanic and Portuguese populations (Fúster, 1983). Spanish phonetics mirror the written language, so that the probabilities of taking two surnames which sound the same but which have different spellings should, in theory, not alter results dramatically. The b and the v, the x and the j (in Galician), the ñ and nh, the s and the z (in Portuguese) all sound the same. Polyphyletism may be encountered when surnames are derived from places within the parish, or from using the name of a profession as a surname. Again, this is more common in British populations (Smith, Taylor etc), but in practice, even in British populations the problem does not seem to be acute. In the historical Galician and Portuguese populations studied, problems arising due to professions keeping their surnames probably did not happen since the majority of the population were peasants.

Limitations of sample size, surname transmission and surname origin and differential migration are all problems that create general suspicion as to whether the inbreeding values derived from isonymy truly reflect the real inbreeding of a population. Hence, there is general agreement in the literature that isonymy tends to overestimate inbreeding (Abade et al. 1986; Ellis and Friedl 1976; Ellis and Starmer 1978; Robinson 1983; Weiss et al. 1983).

However, and despite the problems outlined above, isonymy is still an accepted way of understanding population structure and isolation. At a simple methodological level, using surnames is relatively easy and quick, and allows us to derive information from a large number of individuals without too much effort. Furthermore, the use of a purely cultural trait to stand in for a biological fact (in this case genetic transmission) is possible because surnames are used for that purpose (Lasker, 1980).

## 4.2.2 Aims and Methods

### 4.2.2.2 Aims

The application of the marital isonymy method and the IASS in this study was intended to meet three aims:

- 1) to describe the inbreeding and isolation of the populations considered (obtain the inbreeding coefficient  $F_t$ );
- 2) to account for the social, economic, demographic, kinship and environmental constraints which have resulted in specific  $F_t$  values;
- 3) to compare the  $F_t$  values obtained with the  $\alpha$  values computed using dispensations to increase our understanding of the degree of genetic isolation of the populations of the River Minho valley.

### 4.2.2.2 Theory and Methods

In general, the probability that relatives of any degree have the same surname because they have inherited from a common ancestor is always four times the inbreeding coefficient of the offspring of the particular type of mating. Thus, assuming that all individuals have identical surnames because they have inherited from a common ancestor, then the frequency of the isonymous pairs divided by four will help us obtain the inbreeding coefficient of the population in question ( $F_t$ ).

In their original paper, Crow and Mange (op.cit) showed how they could also divide the  $F_t$  coefficient of the population into a random and a non random component. The random component of inbreeding is  $F_r$  and it is not dependent on preferential relative mating. Instead, it is completely due to chance, and it reflects the past inbreeding and the underlying distribution of surnames of the population.  $F_r$  can be defined as:

$$F_r = \sum p_i q_i / 4$$

where  $p_i$  is the frequency of the  $i$ th surname in the male population and  $q_i$  is the frequency of the  $i$ th surname in the female population.

The original paper also defined the non random component of inbreeding,  $F_n$ , which reflects in addition to  $F_r$ , the frequency of actually mated pairs ( $P$ ).  $F_n$  has a strong behavioural element in its occurrence and represents the preference or reluctance for matings to take place between relatives. Values for  $F_n$  can be either positive- if there is a preference to marry relatives, or negative- if the population avoids marrying relatives.

$F_n$  can be defined as:

$$F_n = P - \frac{\sum p_i q_i}{4(1 - \sum p_i q_i)}$$

where  $p_i$  and  $q_i$  are the same as above and  $P$  is the frequency of isonymous marriages.

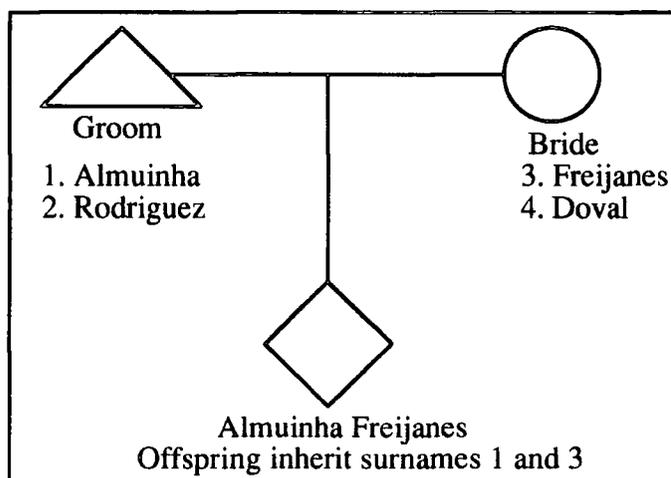
The total inbreeding coefficient is defined by  $F_t$  (or  $F$ ) as:

$$F_t = F_n + (1 - F_n) \times F_r$$

and should be approximately equal to 1/4 the rate of marital isonymy ( $P$ ).

In the present study both the original Crow and Mange method and the IASS (Pinto-Cisternas et al., 1985) system were used to obtain total ( $F_t$ ), random ( $F_r$ ) and non-random ( $F_n$ ) inbreeding values. Following the work done by Shaw (1960), who used Spanish surnames to derive an index of consanguinity for Hispanic populations, the IASS (IberoAmerican Surname System) was introduced and applied to Venezuelan populations (Pinto-Cisternas et al., 1985) to exploit the fact that in IberoAmerican populations an individual has two surnames, instead of one. The first surname is derived from the father and the second surname is the mother's maiden name (in Portugal, the first surname of an individual can be the mother's maiden name, although it is the father that generally transmit the surname). Marriage takes place between two individuals who have two surnames each (Figure 4.1).

**Figure 4.1 Surname Transmission in the IASS system**



I have used the numbers 1, 2, 3, 4 for convenience, both here and in the results section. 1= the first surname of the groom, 2= the second surname of the groom, 3= the first surname of the bride 4= the second surname of the bride. The children of this couple will be Almuinha Freijanes i.e. they will inherit surnames 1 and 3. Surnames 2 and 4 are lost in transmission (Figure 4.1).

Under the IASS four isonymies can be derived;

- 1) 1=3, when the first surnames of the spouses are equal (i.e. the father of the groom and the father of the bride have identical surnames). This isonymy is the Crow and Mange original method.
- 2) 2=4, when the second surnames of the spouses are equal (i.e. the mother of the groom and the mother of the bride have identical surnames);
- 3) 1=4, when the first surname of the groom and the second surname of the bride are equal (i.e. the father of the bride and the mother of the groom have identical surnames);
- 4) 2=3, when the second surname of the groom and the first surname of the bride are equal (i.e. the mother of the groom and the father of the bride have identical surnames).

In addition the isonymies 1=2 and 3=4 were computed to evaluate if there had been any significant changes through time, since they consider the 1=3 for the parents of the groom and bride respectively.

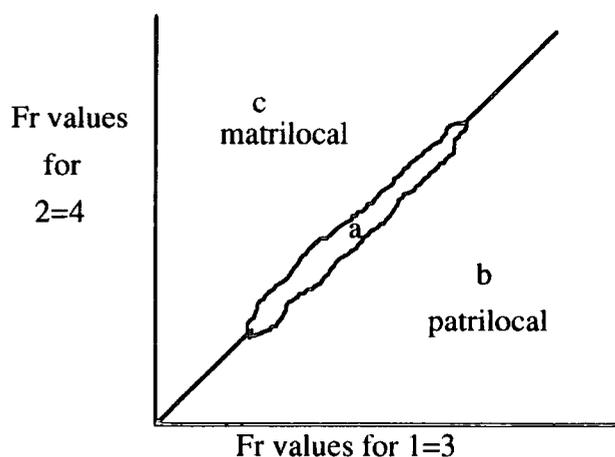
Values obtained using the IASS method and the original Crow and Mange were plotted in a series of graphs to understand both the isolation and inbreeding of each of the populations studied, and to account for the processes which gave rise to such a situation, in particular patterns of movement and residency.

Chapter 3 suggested that the predominant form of residence was patrilocal and it was assumed that if values obtained for the original Crow and Mange (isonymy 1=3) were to be plotted against values obtained using other isonymies, it would be possible to identify which residence pattern was predominant in the populations along the River Minho in the period studied. The idea that plotting values obtained for each isonymy method could identify residence patterns and movement by sex is based on the fact that surnames 1 and 3 come from males whilst surnames 2 and 4 come from females. Any tendency for patrilocal residence patterns will be identified, therefore, by higher values for the 1=3 isonymy in comparison to the other isonymies, for it would reflect the tendency for males to stay in their parish of birth. By identifying a particular residence pattern it would also be possible to understand who was moving at the time of marriage, and thus who would be responsible for gene flow.

In order to test whether a patrilocal residence system exists, therefore, isonymy 1=3, which represents the probability that the surnames of two males are identical by descent from a common ancestor, can be plotted against all other isonymies, and the

distribution of points examined. For example, in a plot of  $1=3$  against isonymy  $2=4$ , which represents the probability that two females have the same surname due to descent from a common ancestor and thus of matrilocal residence (Figure 4.2), a tendency for higher values of  $1=3$  (area "b" in Figure 4.2) would suggest a patrilocal residence pattern. If  $2=4$  exceeds  $1=3$  (area "c" in Figure 4.2), the suggested pattern is one of matrilocal residence, prompted by the higher  $2=4$  values. One could envisage a case where all females moving into a population with patrilocal residence were consistently drawn from the same outside population, but that is unlikely. If there is no evidence for either matrilocal or patrilocal residence patterns i.e. values for  $1=3$  and  $2=4$  are fairly equal, the values will lie equally around the diagonal (area "a" in Figure 4.2). The same logic is applied to plots of  $1=3$  and  $2=4$  against  $1=4$  and  $2=3$  (see below).

**Figure 4.2 Plotting Isonymy Values to Understand Residence Patterns**



Further evidence in favour of either patrilocal or matrilocal residence patterns would be derived from plots of  $1=3$  (tendency for patrilocal residence) and  $2=4$  (tendency for matrilocal residence) against  $1=4$  and  $2=3$ . If there is a preference for either patrilocal or matrilocal residence patterns, the values for either  $1=3$  or  $2=4$  (respectively) will be higher, and a tendency toward either  $1=3$  or  $2=4$  will be evident in the plot. The only circumstance which would make values for  $1=4$  or  $2=3$  higher than  $1=3$  or  $2=4$  would be that two women (for  $1=3$ ) or two men (for  $2=4$ ) are drawn from the same outside population which is unlikely.

The isonymies  $1=2$  and  $3=4$  were then plotted against  $1=3$  and  $2=4$  to see whether there had been any temporal changes in residence patterns. Higher  $1=2$  and  $3=4$  values would also identify a breakdown of isolation through time.

The use of the IASS to provide information on the processes which may have given rise to the Fr values obtained and information on residence patterns is new. The IASS system was initially introduced to compare data derived from each isonymy to

inbreeding coefficients derived from dispensations (Pinto-Cisternas et al., 1985). It has then only been applied to assess which level of population (parish, municipio or zone) should be considered for studying inbreeding (Diaz et al., 1987).

#### 4.2.3 Results

##### *4.2.3.1 Random Inbreeding ( $F_r$ ): Understanding Population Structure (Appendix 1)*

When values for inbreeding are to be used to compare the degree of isolation of a population, the random component of inbreeding ( $F_r$ ) is a better indicator of this than is total inbreeding ( $F_t$ ), because it is a result of population structure alone, and not of any deliberate choice of mates.  $F_t$ , by taking into consideration the amount of inbreeding which is due to preferential relative mating, reflects elements other than chance, and is, as a result, more difficult to interpret.

In this study the values for  $F_r$  obtained using the four different isonymic methods proposed above were compared and contrasted in order to understand the processes associated with inbreeding in the Minho River valley.

When the values obtained for 1=3 and 2=4 were considered a clear tendency toward a predominance of 1=3 became obvious (Plot 1). In other words the first surnames of bride and groom were more likely to be identical by descent from a common ancestor than their second surnames. This means that the father of the bride and the father of the groom are more likely to have the same surname than are their mothers.

Because surnames are taken to be genetic markers specific to a population, the fact that the surnames of the two fathers are identical by descent more often than those of the two mothers suggests mothers are coming into the populations considered from elsewhere, and they are bringing in new surnames. It is fathers therefore, that are local to the populations studied.

Two conclusions can be made. Firstly that there is a tendency for patrilocality. A corollary of this is that females will have to move to their husband's home at the time of marriage. The second conclusion therefore is that females are moving more than males after marriage.

When the correlation coefficient was calculated for the values in the 1=3 against 2=4 plot the negative value obtained ( $r=-0.518$ ) confirmed the tendency toward patrilocality, for as values for 1=3 increase, the values for 2=4 will decrease. In other words, one residence pattern (in this case patrilocality) is exclusive of the other (matrilocality) and both cannot happen at the same time.

Only two parishes show a tendency toward matrilocality (higher 2=4 values): Melgaço and Prado. That Melgaço should be different to all the other parishes is expected, considering its 'urban' nature when compared to the rural character of the other parishes. The point is not so much whether Melgaço is different or not, however, but

rather why an urban environment should have a predominantly matrilineal form of residence. The possibilities for emigration seem highly increased when resident in an urban centre, since these are normally well connected, with better transportation facilities with other towns than the rural parishes and more information on how to travel. Also, the possibilities to travel are made easier because the men are not agricultural labourers anymore, and so are not tied to the land. Robinson (1983) used this explanation to account for the possibilities of movement in Eriksay, Scotland. When this is combined with a general tendency for males to emigrate and for female emigration to be considered strange and unusual, it comes as no surprise that urban centres should be so strongly matrilineal. Perhaps the employment of women in houses, on a salary, would also contribute to the permanent establishment of women in an urban centre such as Melgaço.

The tendency for matrilineality evident in Prado is more difficult to account for since the parish is rural. One suggestion which can be put forward is the proximity of Prado to Melgaço, which could have resulted in Prado being the "suburbs" of the larger urban centre. Also, Prado only attained parish status in 1790, later than any of the other parishes. It may be that people moving into Melgaço settled in the nearby countryside; eventually, the population living just outside the city walls would be large enough to have its own church, and become a new parish. If Prado was indeed born out of Melgaço, then it would tend to reflect any peculiarities exclusive of the latter. Alternatively, the results for Prado could reflect irregularities in surname transmission such that mothers pass on their surnames in first place more often than the fathers, so surname 4 has taken the position of surname 3 i.e. the results are comparable to those for 1=4 and 2=3.

Remoães shows the higher values of 1=3 when compared to 2=4 i.e. the strongest tendency toward patrilineality.

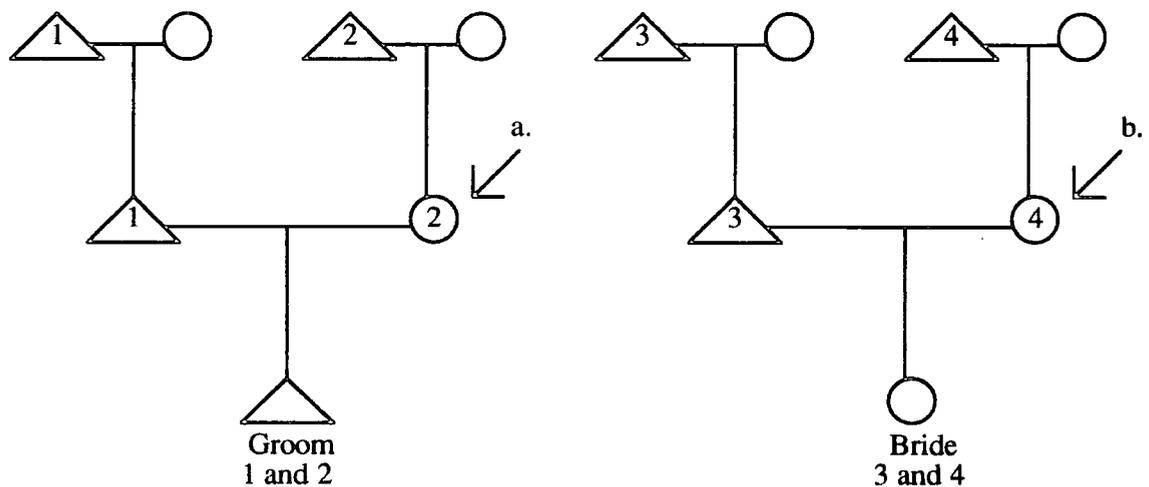
When 1=3 was plotted against 1=4 and 2=3 (Plot 2) the values for 1=3 were consistently higher for all parishes, including Melgaço. The tendency for patrilineal residence is thus confirmed. These findings are corroborated by the plot of 2=4 against 1=4 and 2=3 (Plot 3), in which values are clustered around the main diagonal, with the exceptions of Prado and Melgaço whose higher values for 2=4 in comparison to the other parishes confirm the matrilineal residence patterns for these two parishes.

When isonymies 1=2 and 3=4 (these are equivalent to 1=3 but for the parental generation) were calculated and plotted against 1=3 (Plots 4 and 5) and 2=4 (Plots 6 and 7) the evidence for patrilineality was confirmed. In Plot 4 (1=3 against 1=2) and Plot 5 (1=3 against 3=4), the values for 1=3 were consistently higher for 1=3 than for 1=2 or 3=4, confirming the tendency for patrilineality because surnames 2 and 4 belong to women.

The tendency for patrilocality is confirmed in two ways. Firstly, in the higher 1=3 values, which belong to males. Secondly, in the fact that 1=2 and 3=4 should have lower isonymy values. Figure 4.3 (below) attempts to explain this.

Women carrying the surnames 2 (a. in Figure 4.3 ) and 4 (b. in Figure 4.3) moved into the parish from elsewhere when they married the males with surnames 1 and 3 respectively. This would explain why isonymy values for 1=3 are higher than for 1=2 and 3=4, for whilst 1 and 3 are from the same parish, their wives (2 and 4) came into their parish from another parish when they married, bringing in with them their surnames. The parental generation was also patrilocal.

Figure 4.3 Patrilocality in the Minho River Valley



The plot of 2=4 against 3=4 (Plot 7) confirms the results outlined above, chiefly that there is patrilocality in the previous generation (the parents of the bride and groom). When 2=4 was plotted against 1=2 the tendency was either to have 1=2 and 2=4 values which were very similar or a tendency toward 2=4 i.e. higher 2=4 values. This contrasts with the results outlined above, and I can provide no suitable explanation. The only reason for this discrepancy would lie in the possibilities that 2 and 4 represent women from the same parish, which I have considered as unlikely to happen. In communities where most of the exchange is local, to neighbouring parishes, it may however, come as no surprise that some of the migrants should have the same surname, especially if from the same parish.

#### 4.2.3.2 Comparing Fr values

The mean Fr value for each parish was obtained by averaging out the values for each isonymy in each parish. These mean values were then used to compare the degree of isolation of each parish.

Melgaço appears as the least inbred parish with a value below the other parishes. Its similarity to the value for Cequeliños (730 and 780 respectively) is perhaps misleading, for it owes its higher mean Fr value to the high value for the 2=4 isonymy (1770). The large value for 2=4 in Melgaço has had the effect of inflating the average considerably; however the values for Cequeliños have a more limited range. In other words, if the values for 2=4 in Melgaço had not been as high the mean Fr value would have been much lower than it is. A lower contribution of Fr (random inbreeding) to the total inbreeding coefficient is only to be expected, considering the 'urban' nature of the parish, and it confirms the results obtained using dispensations.

Table 4.8 Fr values for each type of isonymy and for the mean isonymy value (mean Fr)

Parish	Fr × 10 <sup>-5</sup>				Mean Fr
	1=3	1=4	2=3	2=4	
Arbo	1070	960	940	1060	1010
Barcela	1210	1070	950	970	1050
Cequeliños	890	710	720	790	780
Mourentán	970	910	910	850	910
Alvaredo	1300	1010	1070	1110	1120
Melgaço	470	330	350	1770	730
Paderne	1410	1210	1080	1310	1250
Prado	910	750	760	1290	930
Remoães	1550	780	890	860	1020

Data for Galician parishes is divided into two clear blocks; one with the parishes of Arbo and Barcela and the other with the parishes of Mourentán and Cequeliños.

The division of the data into the same two blocks was apparent in the consanguinity analysis when consanguinity frequencies up to the fourth degree were considered. The lower inbreeding of Cequeliños in comparison to values obtained using dispensations could be a function of using Fr rather than Ft values for comparison. Ft values would also consider the effects of non-random inbreeding on total inbreeding

values. Any preference in the parish to marry relatives would have had the effect of increasing inbreeding values in an isonymy analysis, but this would only be detected by calculating  $F_n$  and  $F_t$ . Such a preference would not show in the calculation of  $F_r$ .

The discrepancy in  $F_r$  and inbreeding values for Barcela (lower  $F_r$  than  $\alpha$ ) could also be a function of using  $F_r$  instead of  $F_t$ , if, for example, there was an avoidance or a reluctance to marry relatives within the parish. Portuguese parishes are also divided into two groups, one with the parishes with Melgaço and Prado and the other group with the rest of the parishes, so that patrilocal parishes are more inbred than matrilocal ones.

#### *4.2.3.3 Non random Inbreeding ( $F_n$ ): Understanding the Preference or Reluctance to Marry Relatives*

The contributions of  $F_n$  to total inbreeding vary depending on the type of isonymy used, so an average was computed which combined the four isonymies. Overall,  $F_n$  values are constantly low, with the exception of Remoães- this could be due to chance or to the strong patrilocal tendency outlined above especially if associated with patrilineal inheritance. Melgaço has the lowest  $F_n$  which is expected due the difference between this 'urban' parish and the other rural parishes.

The Galician parishes of Barcela and Cequeliños appear concerned to avoid marriage to a relative as their negative  $F_n$  values testify. These two parishes are also the smaller parishes, so we might assume that the knowledge of who is a relative and who is not is more complete than in other parishes. Under such circumstances, the preference seems to be to avoid marrying a relative. In the consanguinity analysis, Barcela appeared as not very inbred, and the negative  $F_n$  values found here would explain why this is so. Being in a small parish and having strong kinship rules, the parishioners would have had to look for partners elsewhere, increasing the exogamy of the parish and decreasing its inbreeding levels. The case of Cequeliños is more difficult to account for, since when dispensations were considered, the parish was described as isolated and with a preference to marry relatives, presumably due to differences in land inheritance. This is not so, as we know from the negative  $F_n$  value and the high  $F_n:F_t$  ratio. The results obtained for the parish in the consanguinity analysis are therefore due to processes other than any specific socio-economic process such as land inheritance.

Arbo's results are consistent with previous findings: high  $F_r$  values and low  $F_n$ .  $F_n$  values here are always positive regardless of the isonymic method used, which suggests that marrying relatives is not forbidden. However, the absolute contribution of  $F_n$  to  $F_t$  is very low, which means  $F_r$  is more important in explaining  $F_t$  i.e.  $F_t$  is due to chance. Mourentán is different, and the high contribution of  $F_n$  to  $F_t$ , supports the case for the parish having some degree of preferential relative mating. This would explain the

Ft values obtained, but here again there is some contradiction, for although Ft values are high,  $\alpha$  values are the lowest of the Galician region.

Portuguese parishes have much lower Fn values and total contributions of Fn to Ft with the exception of Remoães, which has values above the Galician range. Higher Fn values were expected because it was thought that cousins were chosen as marriage partners within the parish as a result of land inheritance patterns in Portugal.

That Melgaço should have a negative Fn value is almost expected, if its urban nature is taken into consideration. The choice of mates is always going to be extensive, because of the presence within the town of people from an wide range of different places, Avoiding marriage to relative is going to be easier. However, it is worth noticing that the average Fn value obtained is made negative by the very significant value obtained for Fn using the 2=4 isonymy. This is very important, because it means that when the mothers of the bride and groom are concerned marrying relatives will be avoided. Melgaço was described above as a matrilocal parish, so the fact that when the two mothers are known to be relatives the tendency will be to avoid marriage is significant, and puts the Fn results into their proper context. Furthermore the conditions of a town may be altogether less conducive to inbreeding, because of the lack of attachment to land, which would have reduced the need to marry a cousin in order to keep the land within the family.

Table 4.9 Fn values for each type of isonymy and for the mean isonymy value (mean Fn)

Parish	Fn $\times 10^{-5}$				Mean Fn	Fn/Ft $\times 100$
	1=3	1=4	2=3	2=4		
Arbo	110	190	250	10	140	11.2
Barcela	-650	-130	-40	-20	-210	24.7
Cequeliños	-280	-90	-90	-170	-160	25.8
Mourentán	480	170	60	190	230	20.3
Alvaredo	-250	500	-180	430	130	10.3
Melgaço	340	130	480	-1060	-30	4.3
Paderne	400	290	10	-100	150	10.6
Prado	160	280	-10	-1080	-240	20.3
Remoães	2450	000	-530	-60	470	31.7

Remoães is the complete opposite, and its high Fn mean value and the strong contribution of Fn to Ft can be practically entirely due to the high Fn value obtained for the traditional Crow and Mange isonymy (1=3). We know that the parish has a strong

patrilocal tendency, so the high  $F_n$  value is very significant. It is the opposite to Melgaço because in this case there is a strong preference to marry a relative *if* the fathers are related. In other words, this finding could reflect land ownership and patrilocal inheritance of the parish: there would be a strong tendency to marry a relative who was a male in order to keep land within the family.

Alvaredo and Paderne have low  $F_n$  values, which means their high  $F_t$  results can be explained almost exclusively due to chance (high  $F_r$ ), and their case is comparable to that of the Galician parish of Arbo. Such a similarity was already pointed out for Paderne and Arbo in the consanguinity analysis using dispensations.

Prado's results are in line with the results obtained for the small Galician parishes in terms of negative  $F_n$  means and also in terms of the contributions of  $F_n$  to  $F_t$ .

Selective migration along kinship lines has been put forward to explain  $F_n$  values under the assumption that this phenomenon would reduce the effective population size, increase  $F_r$  and decrease the contribution of  $F_n$  to the total inbreeding coefficient  $F_t$  (Abade 1992; Leslie 1980; Leslie et al. 1981; Brennan 1983; Brennan and Relethford 1983). It is tempting to suggest that the smaller parishes, if under the effects of selective migration during seasonal and temporary migration, would tend to experience the effects of this on its effective population size more obviously. This would be reflected in lower  $F_n$  values. Instead, it is the larger parishes that have lower  $F_n$  values, so this argument although applicable elsewhere (op. cit. above), does not seem pertinent here.

#### 4.2.3.4 Total Inbreeding ( $F_t$ ): Comparing Galicia and Portugal

Galician parishes are less inbred than their Portuguese neighbours. This finding corroborates the results obtained using dispensations to calculate the inbreeding coefficient  $\alpha$ . If Melgaço is excluded from the analysis, then the gap between the two regions is increased.

**Table 4.10  $F_t$  values for the two areas, with and without Melgaço**

$F_t$ value ( $\times 10^{-5}$ )	PORTUGAL	GALICIA
With Melgaço	1220	960
Without Melgaço	1330	

The smaller Galician parishes have lower  $F_t$  values than their larger neighbours despite the strong relationship that has been found between small sized parishes and high inbreeding levels (Dyke 1984; Relethford 1982:1986:1988; Relethford et al. 1981). Nevertheless, the positive association between these two variables has been pointed out to exist in very small parishes- Dyke (op.cit) suggested a size of around 300. In fact, the

only parish which has a population size around the 300 inhabitants threshold is Remoães and it is this parish that also has the highest Ft values. Ft values for Remoães might well reflect a combination of limitations imposed by small population sizes, strong patrilocal residence, male inheritance and preferential relative mating. Both Barcelá and Cequelíños have population sizes above that threshold. Their Ft values could possibly be explained in terms of very strong avoidance rules for marrying relatives, which would reduce the total Ft values. Abade (1992) suggested that high population sizes could also prompt a higher number of consanguineous matings than expected by chance alone, and argument which is, in a way, similar to that proposed by Coleman (1977). Large population sizes become providers of migrants for small neighbouring parishes, but because their large population also assures choice of mates for the parishioners, large parishes fail to receive migrants. In their provision, their effective population sizes are reduced, so that the chances of choosing a mate of suitable age and marital status who also happens to be a cousin are increased. The high Ft values for the bigger parishes of Arbo, Mourentán could further be due to the former's high Fr values and the latter's important contribution of Fn to Ft.

All of the Portuguese parishes, except Melgaço, have higher Ft values than the Galician parishes, suggesting populations which are more highly genetically isolated. The higher Ft values also tell us about the contribution of remote consanguinity to the inbreeding coefficient: in their original paper Crow and Mange (op.cit) explained how more than half of the total inbreeding was due to ancestry more remote than fourth cousins and that it was this which made isonymy values higher. In other words, the high Ft values ascertained for Portugal not only tell us that the parishes are more isolated than their Galician neighbours at the particular point in time considered, but also that they have always been more isolated.

Melgaço has a low Ft value compared to its neighbours, which could be accounted for in terms of its different socio-economic setting. However, its Ft value lies between those of Barcelá and Cequelíños, and is in fact slightly higher than the latter. The strong tendency toward matrilocality and a negative attitude to marrying a maternal relative might explain the Ft values obtained.

#### 4.3 COMPARING VALUES FOR Ft AND $\alpha$

In the comparison of inbreeding coefficients estimates for dispensations including up to the fourth degree of relationship were used. This choice can be justified in two ways:

- 1) Fourth degree of relationship makes up over half of the inbreeding coefficient derived from isonymy (Crow and Mange, 1965);

2) In both  $F_t$  and  $\alpha$  up to the fourth degree the impact of random ( $F_r$ ) and 'sought' (positive  $F_n$ ) consanguinity is expressed, making both estimates analogous.

The isonymy method reveals consistently higher estimates of inbreeding than dispensations do. Mean  $F_t$  values lie somewhere between that for offspring of second cousins and second cousins once removed, even though in Galicia the  $F_t$  value for Cequeliños lies somewhere between that of the offspring for second cousins once removed and third cousins i.e. it is the least inbred parish of all. This parish is also the one which has a higher correspondance between the two inbreeding values; in all the other parishes the values for  $F_t$  are over ten times higher than the values for  $\alpha$ , a ratio which has been reported in the literature (Robinson, 1983).

Table 4.11 Comparison of Inbreeding Coefficients Derived from Dispensations up to the Fourth Degree ( $\alpha$ ) and from Isonymy (Mean  $F_t$ ).

Parish	Dispensations $\alpha \times 10^{-5}$	Isonymy $F_t \times 10^{-5}$
Arbo	149.31	1250
Barcela	85.11	850
Cequeliños	266.77	620
Mourentán	52.71	1130
Alvaredo	86.79	1260
Melgaço	14.49	700
Paderne	96.72	1420
Prado	63.03	1180
Remoães	72.15	1480
Galicia	72.58	960
Portugal	188.52	1200

The values obtained using the isonymy method fail to reveal the differences which were found between Galicia and Portugal when dispensations were considered. Such differences were taken to be the result of socio-economic processes which operated differently in the two areas, and were largely related to land inheritance. Using isonymy helps us to realise that the differences between the two areas are not as marked, and that both Galician and Portuguese parishes are behaving more or less as part of the same region, with the same socio-economic, demographic, geographic and kinship pressures. The two areas operate under a patrilocal society, where women move at the time of

marriage even if such movement is predominantly local. Married men move less often. These results are consistent with the designation of the *tercio* for men in Galician society (Lisón Tolosana 1971). That patrilocality should also be predominant in Portugal is consistent with the deduction made in Chapter 3 regarding the time period of this study, 1790-1851, as a patrilocal pre-emigration period..

The consistently low or negative  $F_n$  values challenge the land inheritance assumption, at least for the Portuguese side, for we know that land inheritance in Galicia was not possible due to the system of hereditary tenancy. Alternatively one could argue that these low  $F_n$  values reflect the small proportion of land holding peasants; their total numbers were so small their particular mating strategies would not have contributed in a large way to the overall inbreeding coefficient ( $F_t$ ).

The low  $F_n$  values and thus  $F_n/F_t$  ratios suggest random inbreeding is responsible for total inbreeding ( $F_t$ ) values in both Galicia and Portugal. This verifies the results obtained in the consanguinity analysis: when fourth degree of relationship was taken into account the inbreeding values increased, and both Galicia and Portugal had fourth degree of relationship as the highest contributor to total  $\alpha$  values (58.6% and 44.2% respectively). This fact challenges the land inheritance assumption once again, for fourth cousin marriage would not have been a strategy introduced to keep land within the family.

The isolation of the Portuguese parishes when compared to the Galician parishes is confirmed by both types of analyses and the gap between the two widens when Melgaço is excluded from the study. This isolation is evident when  $F_r$  values are considered, since these are higher on average, but also on the higher  $\alpha$  values and the higher  $F_t$  values.

Differences between Portugal and the Galician parishes of Arbo and Mourentán are not quite as striking: the two Galician parishes are within the Portuguese range in  $F_r$ ,  $F_n$  and  $F_t$ . Arbo also appeared similar to the Portuguese parishes when frequency of consanguinity up to third and fourth degree of relationship was considered, and showed high inbreeding values regardless of degree of relationship considered. We can therefore conclude that Arbo and Paderne are the most isolated parishes. Mourentán is different for although described as highly open and thus not very isolated in the consanguinity analysis, the isonymy analysis revealed it as being isolated and inbred. I believe these differences can be explained in terms of the  $F_n$  component of inbreeding. In the consanguinity analysis Mourentán showed a strong preference to marry relatives, and this was reflected in the engagement of consanguineous marriages in pre-marital movement. Distances of 11 kilometres plus were obtained. In the isonymy analysis, the  $F_n$  component was positive and accounted for 20.3% of total inbreeding ( $F_t$ ), one of the highest figures. This would explain the high  $F_t$  values, even if  $\alpha$  values were not quite as high.

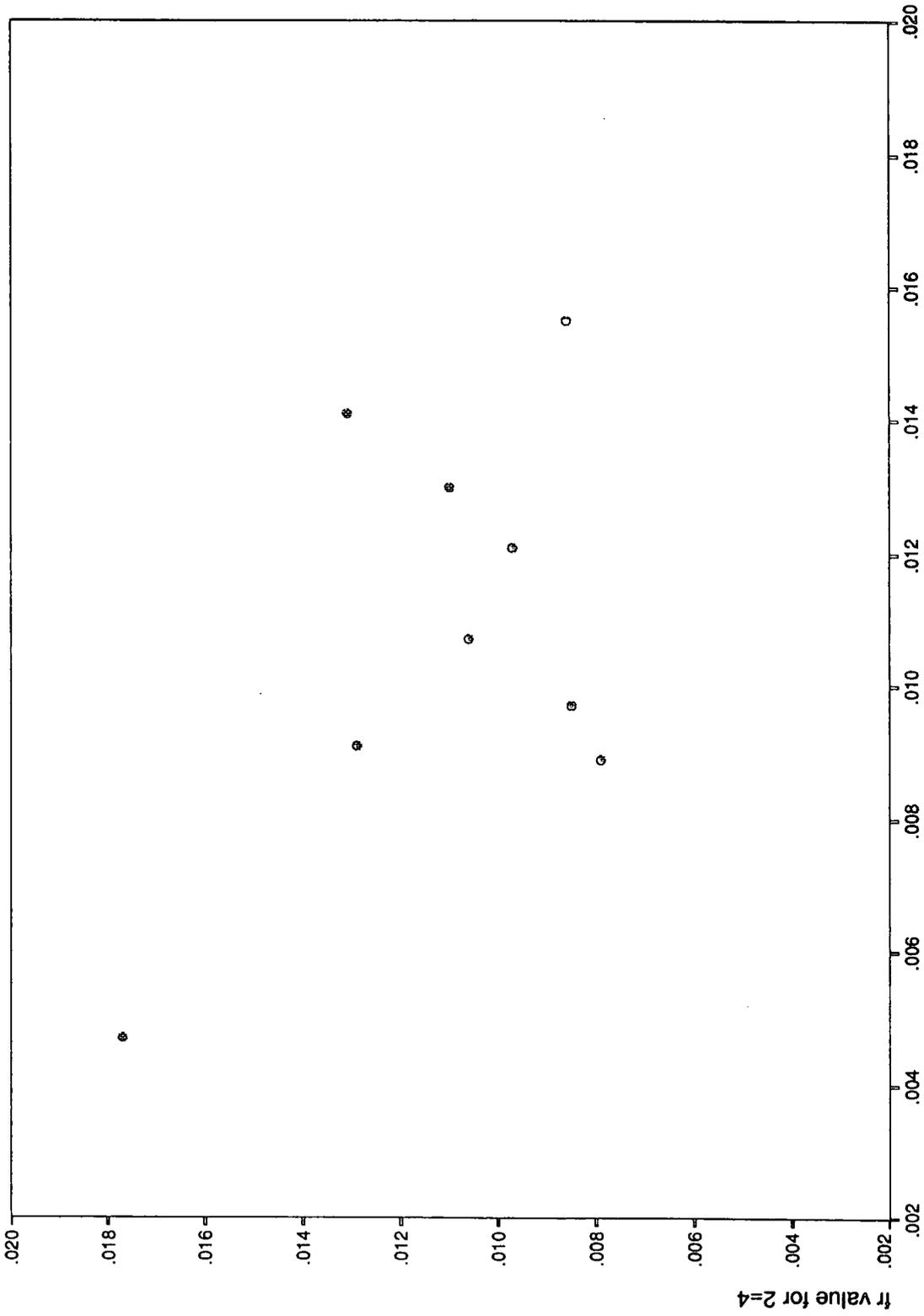
It would appear that the differences between the two regions are due to the parishes of Barcela and Cequeliños, whose reluctance to marry relatives apparent in their negative  $F_n$  values and high contributions of  $F_n$  to  $F_t$ , would have reduced the importance of  $F_r$  (i.e. chance) on  $F_t$ . Total inbreeding values would fall as a result. The negative attitude toward marrying a relative would reduce the isolation of these parishes by opening them to the outside; being medium-sized they would not be able to sustain themselves under strong parish endogamy. The results for Barcela are more consistent in both types of analysis than those for Cequeliños, which tended to appear as an isolated parish. The only explanation is that either the  $F_t$  or the  $\alpha$  results for this parish are due to chance.

The high  $F_r$  and  $F_t$  values of Alvaredo and Paderne are consistent with  $\alpha$  values, confirming the isolation of these two parishes. In the case of Paderne, the strong geographical constraints outlined for this mountain parish are verified. Results for Remoães are also consistent throughout, and it would seem that the parish is highly inbred due to its small population size (it is the smallest parish) and its lack of premarital movement at the time of marrying relatives.

#### **4.4 CONCLUSION**

The area emerges as isolated with the populations that form it behaving as endogamous, patrilocal groups. Where there is migration it is predominately movement by women at marriage. In general, the constraints of population size, geography and the economic circumstances which attach people to their land all seem to contribute to the resulting inbreeding and isolation.

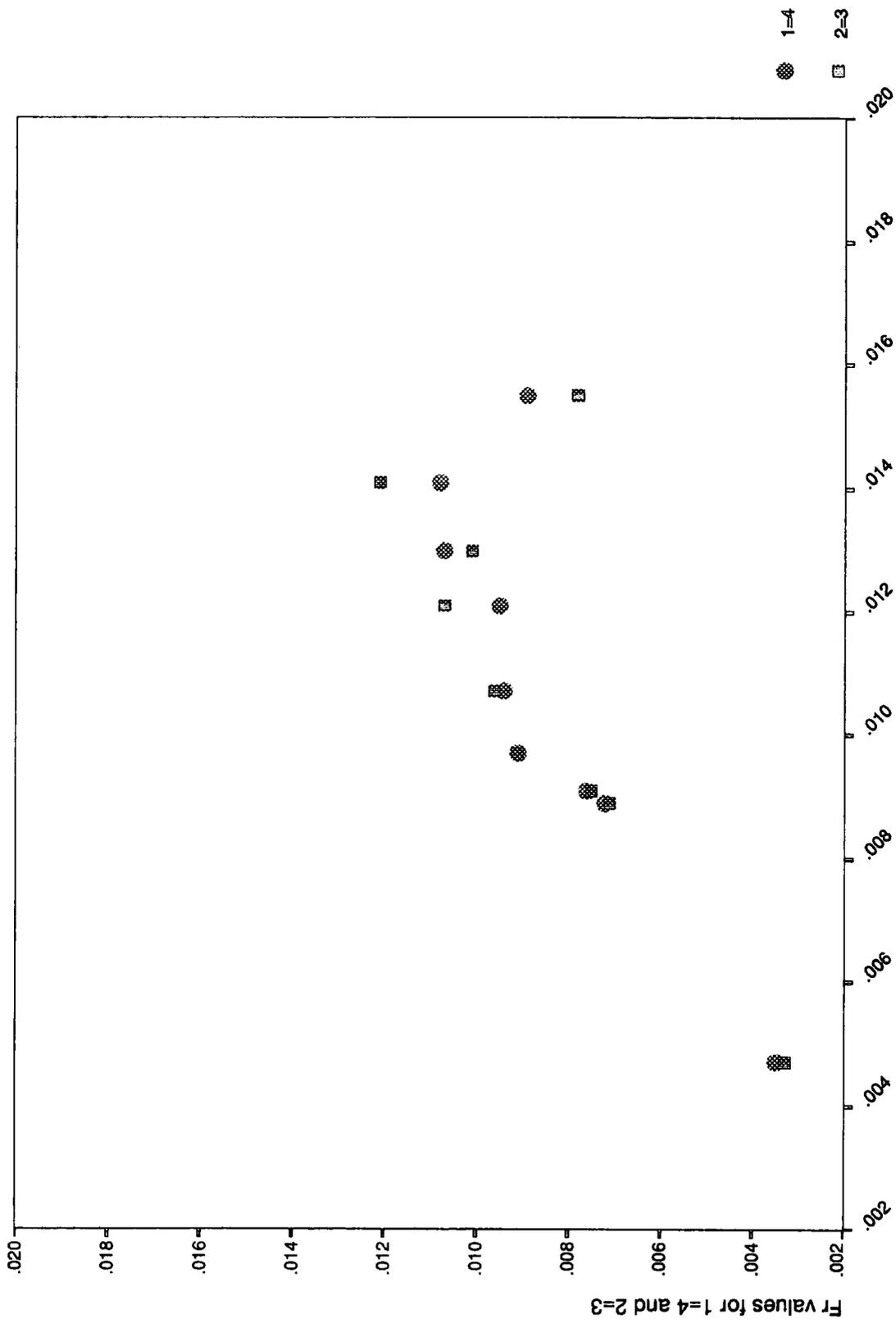
APPENDIX 1  
ISONYMY PLOTS



fr value for 1=3

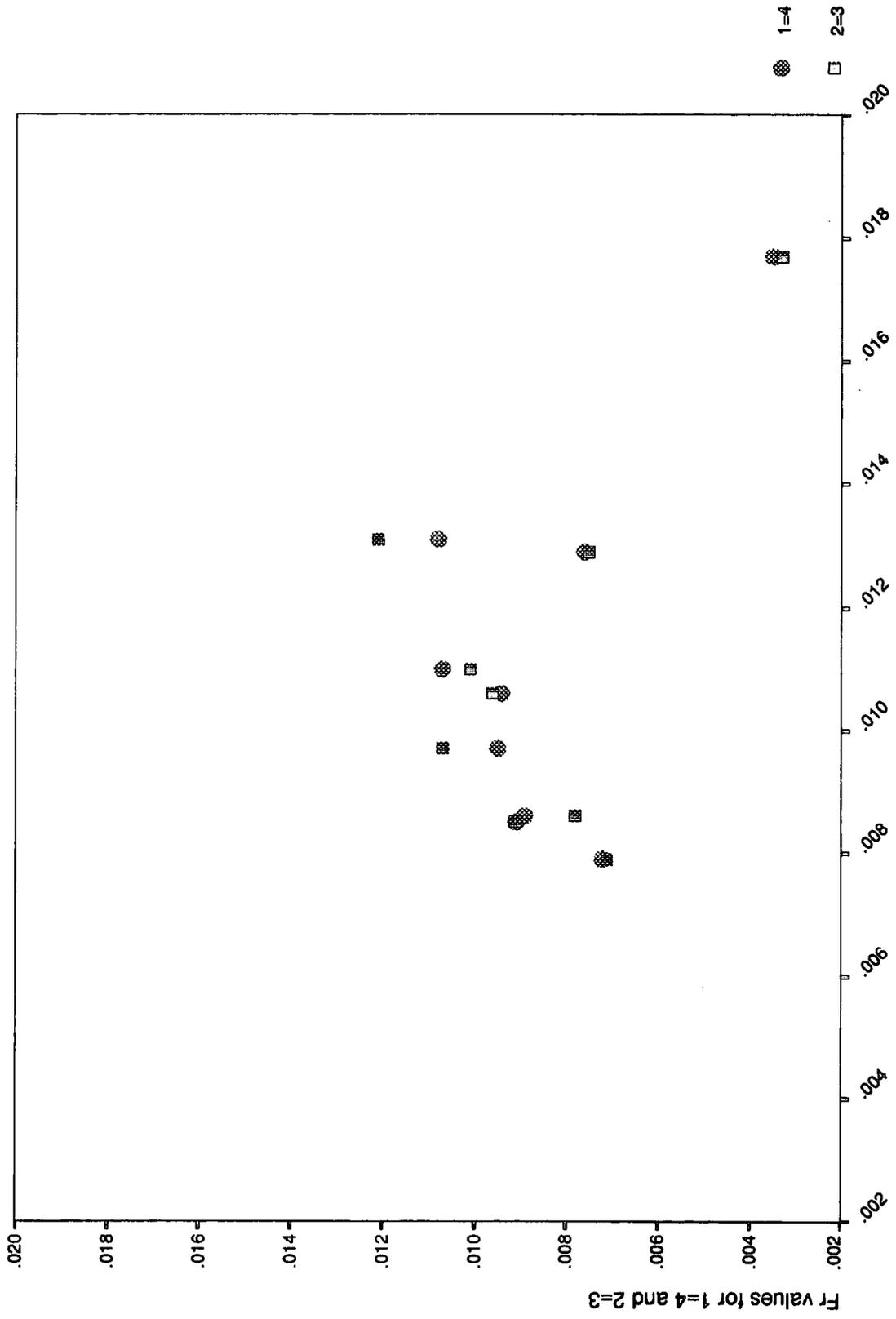
Plot 1

1=3 with 2=4



Plot 2

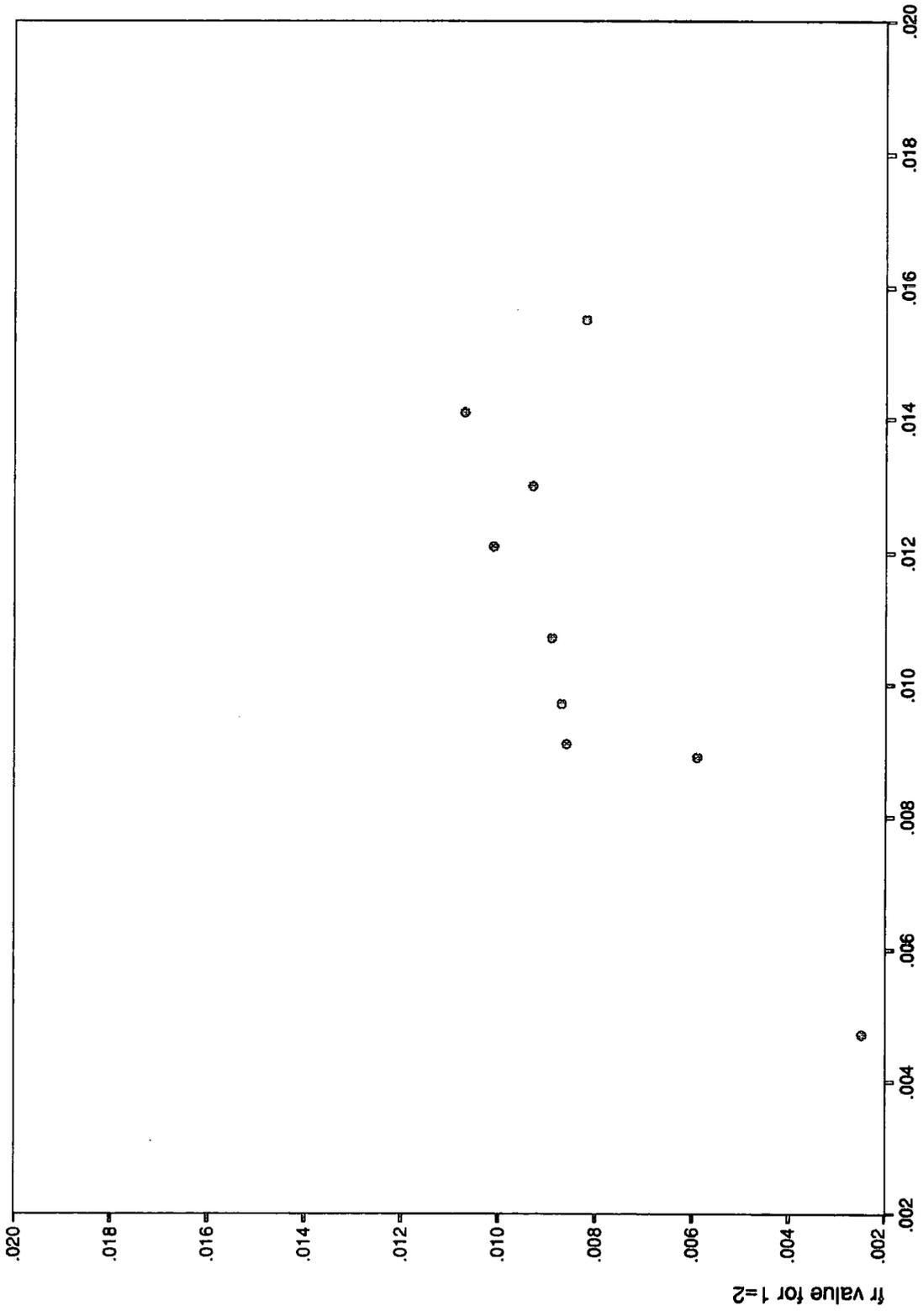
1=4 and 2=3 with 1=3



Fr values for 2=4

Plot 3

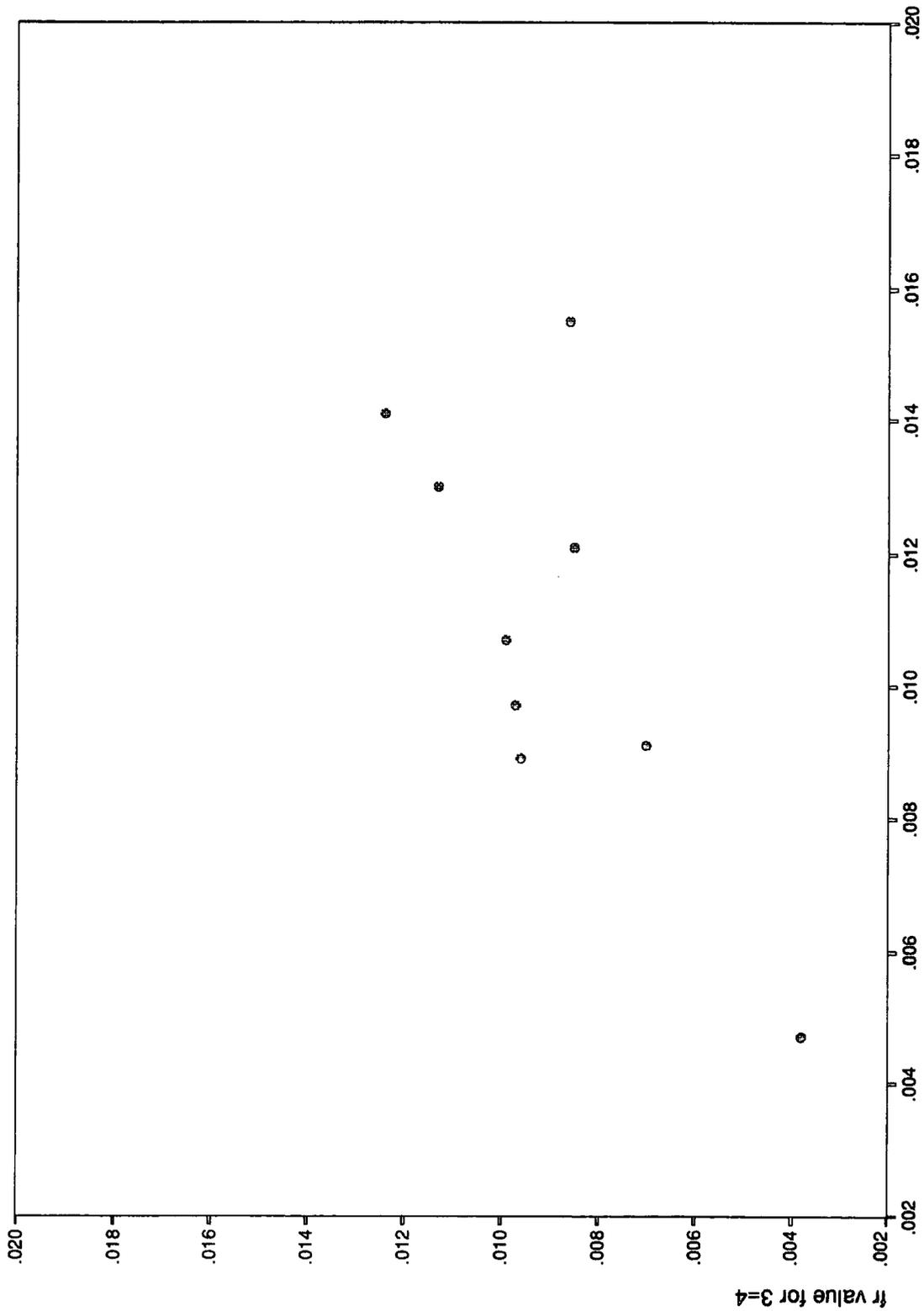
1=4 and 2=3 with 2=4



fr value for 1=3

Plot 4

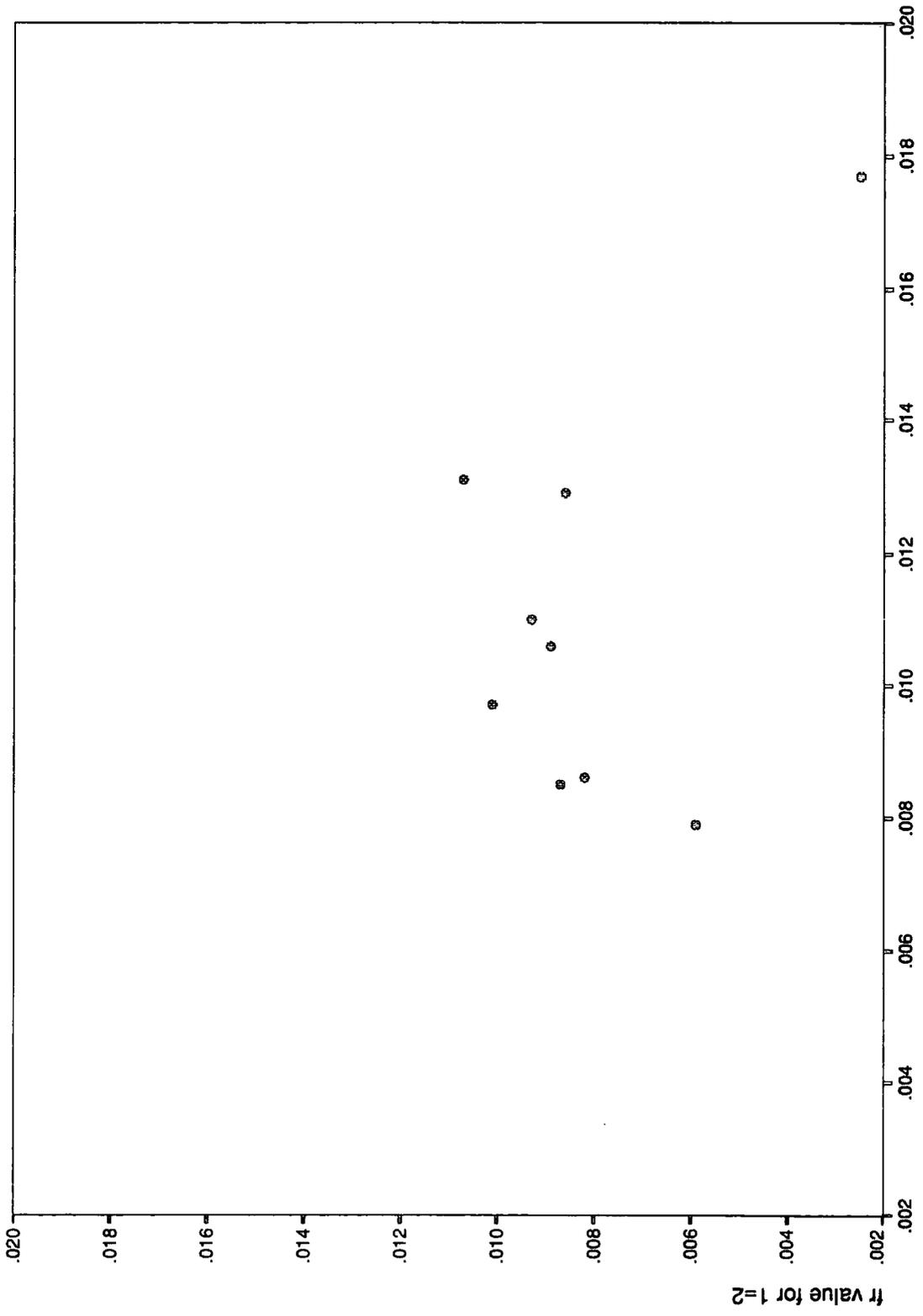
1=3 with 1=2



fr value for 1=3

Plot 5

1=3 with 3=4

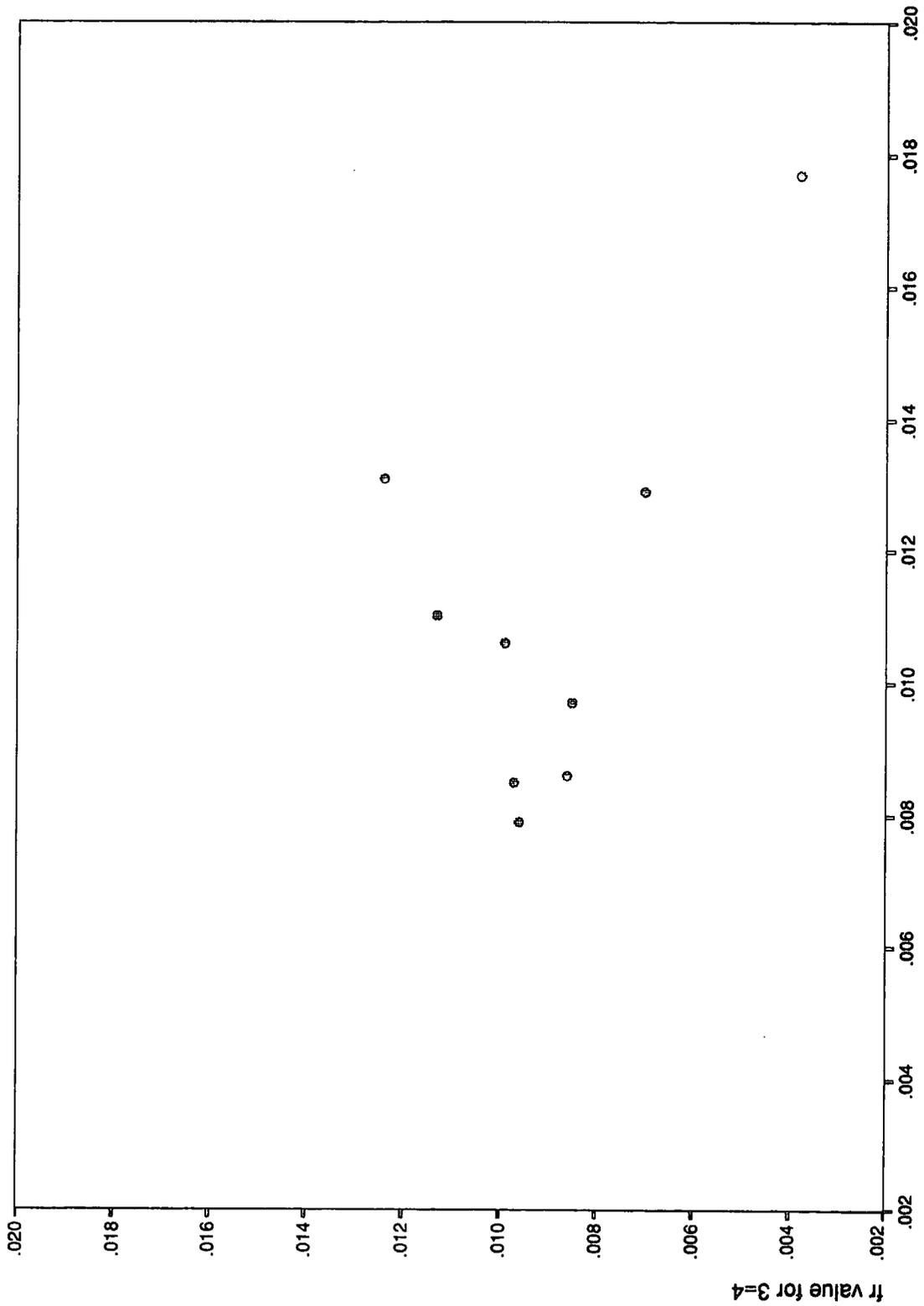


fr value for 2=4

fr value for 1=2

Plot 6

2=4 with 1=2



fr value for 2=4

Plot 7

2=4 with 3=4

Chapter 5  
DISTANCE AND ORIENTATION

Chapter 2 reviewed the relative advantages and disadvantages of using marital migration data to infer gene flow. Perhaps the main limitation of using this type of data for the purpose of deducing gene flow lies in the assumptions which have to be made regarding the birthplace and premarital residence of the spouses, the lack of movement after marriage and the issue of differential fertility for sedent and migrant women.

Notwithstanding these limitations, marital movement is informative of the social behaviour of populations. The incidence of links through marriage between places which are spatially separated from one another, and the distance between these two places is therefore a good indicator of the range of social contact and of daily mobility of the population, for chance encounters may often lead to marriage (Coleman, 1984). This is important for genetic structure, because it increases the amount of neighbourhood knowledge (Swedlund, 1972:1984) and, in doing so, increases the possibilities of genetic interchange (Boyce et al., 1967). Marital mobility can ultimately, therefore, help us to predict possible sources of genes and axes of gene flow, and thus to understand better the biological behaviour of populations. If we keep in mind that marital mobility will always be significant for population genetic structure, then using marital data to explain genetic structure is a very valid tool indeed.

Further research will help decide whether or not marital migration data from the River Minho Valley can be adequately used as a reflection of gene flow by comparing it with parent-offspring migration data. In this study, both birth and residence localities of bride and groom prior to marriage were recorded to describe the distance and orientation involved in choosing a partner in order to meet two complementary aims:

- a) Describe the ways in which the observed patterns of marital mobility link populations along and across the River Minho in an account of the extent and orientation of marital movement and the of the distances travelled for marriage.
- b) Discuss the importance of the River Minho as a geographic and political barrier to population movement and genetic differentiation.

## 5.1 MARITAL DISTANCE

### **5.1.1 Introduction**

Distance is an important parameter of population movement and gene flow (Azevêdo et al 1969; Boyce et al 1967; Cavalli-Sforza and Bodmer 1971; Coleman 1977; Constant 1948; Kimura and Weiss 1964; Málecot 1950; Morton 1973:1977; Swedlund

1972:1984; Wright 1943; Zanardi et al. 1977). During the period studied the lack of suitable roads, cars or railway service and the reliance on walking as a method of transport would emphasize the effects of distance. As far as marriage behaviour was concerned, therefore, distance would have heavily influenced the distribution and range over which movement occurred, encouraging parish endogamy and short-range movement (see Chapter 3). This would have had an important effect on genetic differentiation, and would have contributed to the genetic isolation of the area (Brennan 1981; Hiorns et al., 1973; Küchemann et al., 1974; Roberts et al., 1981).

In this study, marital distance is defined as the distance between the birthplaces of the spouses at the time of marriage. The use of the birthplace of bride and groom is necessary in order to know the origin of genes for both spouses, and understand the extent to which the marriage will link two genetically different and spatially separated areas. This approach has been used elsewhere (Brennan 1983; Mehrai 1984; Mehrai and Sunderland 1991; Sheets 1980). In addition, the residences of the spouses at the time of marriage were also recorded, to obtain a better picture on the patterns of pre-marital movement. Residence places alone have also been used in a variety of studies (Harrison et al. 1970: 1971; Küchemann et al. 1974). Some studies have used both birthplace distance and distance between residence places (Coleman 1984; Jeffries et al., 1976; Jorde 1984)

The use of both places of birth and of residence in this study is deliberate. It was thought that the use of both types of places would give a better indication of total movement undertaken. Also, using both places overcomes one limitation of using marital data, that which assumes that birthplace and residence place are one and the same, and will therefore be more representative of the situations under which the parishes existed.

An analysis of mobility by sex followed in order to examine which sex was the agent of gene flow and thus responsible for the spatial gene distribution described. This analysis was prompted by the results obtained for isonymy in Chapter 4, which suggested patrilocal residence pattern and the movement of women for marriage.

Endogamy is defined here as parish endogamy for both Galician and Portuguese parishes i.e. an endogamous marriage involves two individuals born in the same parish. By definition the distance involved in an endogamous marriage was nil (0 km): this is not strictly accurate, for in some big parishes the distances between two villages would most certainly have been more than 1 km. However, the delineation of the parish border and the importance of parish endogamy for Galicia made it necessary to apply a standard distance to compare results between populations. Spatial exogamy, the proportion of exogamous marriages (i.e. those which involve a spouse from outside the defined population unit), informs us on the relationship of each individual parish with the world

outside it: with its immediate neighbours and with places that are further away, so that a distinction can be made between short and long distance migration.

## 5.1.2 Results

### 5.1.2.1 Spatial Gene Distribution

Information on the extent of endogamy and exogamy of each parish contributes to our understanding of spatial gene distribution within each area (Galicia and Portugal)<sup>1</sup>. For each exogamous marriage, it is also necessary to distinguish between partners who have come from nearby populations and partners who have come from long-distance populations. This is because longer distances will provide migrants with a more different genetic constitution to that of local mates (whether parish or neighbourhood), and in doing so will help speed up the process of isolation breakdown (Morton et al., 1976)..

Endogamy and short range migration will result in the localization of genes and increased genetic variance between sub-populations. There will be high possibility for drift and consanguinity. A tendency toward exogamy will result in wide marriage horizons, a more open gene pool and a decrease in the chances of chance fluctuations in gene frequencies.

In addition, and in order to understand better the contribution of exogamy and endogamy to marital mobility, the admixture rate was calculated for each parish. Initially derived by Sheets (1980), this calculation is based upon the number of exogamous partners and the number of migrant couples who are born outside the parish. It is obtained by adding the number of exogamous partners to the number of migrant couples and dividing by the total population size. The admixture rate is an estimate of the genetic isolation of each parish: low rates will be indicative of genetic isolation. The higher the rate, the more open a parish will be, and the less genetically isolated as a result.

Because a measure of endogamy can be ambiguous depending on whether it is calculated from the viewpoint of persons or marriages (Coleman, 1977), endogamy was defined here as the proportion of endogamous marriages contracted in the population rather than being based on the endogamy of partners (ibid. pp.21).

#### 5.1.2.1.1 Galicia

All of the Galician parishes show a tendency toward endogamy, i.e. localization of genes (Table 5.1). This is consistent with the consanguinity values obtained for the area. Endogamy values vary within a very limited range, with the parish of Arbo as the most endogamous, most isolated one (80.3%) and the Cequeliños as the least endogamous, least isolated parish (69.3%). The findings regarding spatial exogamy confirm Arbo's position

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<sup>1</sup>Absolute number of marriages for the analysis of endogamy and exogamy are the same as for section 4.1 (inbreeding coefficients derived from dispensations) but not as in section 4.2 (Isonymy Analysis) (see Chapter 2)

as the most isolated in the area, with a very low exogamy rate in comparison to its neighbours, all of which have exogamy rates of over 25%.

The data are indicative of isolated parishes attractive only to a small proportion of migrants. This isolation is accentuated by the low proportion of migrant couples into each Galician parish, so that movement into each of the Galician parishes considered is exclusively for marriage with a parishioner.

The isolation is confirmed by the very low admixture rates obtained. Despite the low exogamy rate, Arbo loses its position as the most isolated of the Galician parishes once the admixture rate is considered. This is interesting for it must mean that the proportion of migrant couples is contributing toward the genetic openness of the parish. In Mourentán the proportion of migrant couples appears unimportant in genetic terms, for despite the higher exogamy rate, the admixture rate is lower than that for Arbo. Migrant marriages must contribute more to the spatial distribution of genes in Barcela, for despite a similar proportion of migrant couples into the parish in comparison to Mourentán, the admixture rate is higher.

**Table 5.1. Endogamy, Spatial Exogamy and Admixture Rate: Galicia**

Parish	Endogamy (%)	Spatial Exogamy (%)		Admixture Rate
		One partner exogamous	Both partners exogamous <sup>2</sup>	
Arbo	80.3	18.7	1.0	0.087
Barcela	74.0	25.2	0.8	0.094
Cequeliños	69.3	29.6	1.1	0.133
Mourentán	71.8	27.3	0.9	0.082

The results for the admixture rates are arranged by population size: the biggest parish has the lowest rate and the smallest parish the largest rate. Because one of the parameters of the rate is population size, it demonstrates the importance of population size for population exchange. The bigger parishes are more self-sufficient in terms of mates. They are highly exogamous because they provide mates for small neighbouring populations rather than taking them in themselves. This provision without reception is reflected in the high inbreeding levels and discussed above in more detail. In Chapter 4 it was argued that the effects of this provision without reception is reflected in the high inbreeding levels (section 4.1.3.3.2).

On the basis of the rates described above, it would appear that Cequeliños is the Galician parish which is contributing most to the increase in spatial gene distribution, and

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<sup>2</sup>Both partners exogamous' is referred to in the text as migrant couples or migrant marriages.

the most likely recipient of the migrant genes into the region. This could reflect its smaller population size, its status as a non-paying parish offering possibilities for owning land or its intermediate position between the crossing points at Arbo and Frieria.

#### 5.1.2.1.2 Portugal

The Portuguese populations are divided into two clear groups. The first group comprises Alvaredo and Paderne, and have a higher proportion of endogamy, over 60%. These two parishes appear more like the Galician parishes, although the figures are lower, more in line with that for Cequeliños. The other group includes Melgaço, Prado and Remoães, and shows low overall endogamy, especially Melgaço, with only 38.7% endogamy (Table 5.2). The low endogamy result for Prado (48.9%) was expected after the analysis of inbreeding and isolation situated the parish close to Melgaço; the similarities were accounted for by regarding Prado a suburb of the 'urban' town next to it. The even lower (41.3%) result for Remoães is more difficult to explain although it probably reflects its low population size which prompts exogamy in order to find a mate, in a similar way to Cequeliños.

**Table 5.2 Endogamy, Spatial Exogamy and Admixture Rate: Portugal**

Parish	Endogamy (%)	Spatial Exogamy (%)		Admixture Rate
		One partner exogamous	Both partners exogamous	
Alvaredo	67.9	31.0	1.1	0.094
Melgaço	38.7	51.0	10.3	0.168
Paderne	63.2	35.5	1.3	0.086
Prado	48.9	44.4	6.7	0.078
Remoães	41.3	51.1	7.6	0.170

The results obtained for the spatial exogamy of the Portuguese parishes confirms the isolation of Alvaredo and Paderne with respect to the other populations, for they have not only a lower percentage of marriages involving one exogamous partner but also low percentages of migrant couples into the parish. This is reflected in the very low admixture rates, which lie in the Galician range.

Prado provides an attractive contrast. Despite its lower endogamy and its consequently higher proportion of spatial exogamy, and the higher percentage of migrant marriages, the admixture rate value is lower than for any other parish. The reasons for this inconsistency are difficult to explain. One possible explanation would be that the nuptiality of the parish is lower than in other parishes in relation to total population size.

If there is less nuptiality in relation to population size in any parish, then the possibilities of marrying an exogamous partner are somewhat decreased, simply because there are less marriages being contracted. Because the two of the three parameters of the admixture rated described by Sheets (op.cit.) refer to exogamy, the decrease in nuptiality and subsequent decrease in exogamy would reduce the admixture rate values for a parish. The results for Melgaço are a result of the 'urban' properties of the parish, which would attract people from a wider range of populations, especially other towns (Hiorns et al. 1973; Roberts et al. 1981), increasing its exogamy. The high percentage of migrant couples into the parish is also expected, for the town acts as a meeting place for individuals who want to find work other than agricultural work, and this would attract both men (involvement in textile industries, iron smelters etc) and women (domestic service, wet nurses).

Remoães is also a very open parish, a reflection of its small population size and its proximity to an 'urban' centre, which would have provided not only a large proportion of exogamous partners but also a high proportion of exogamous partners who have travelled a long way. However, it is difficult to explain why Remoães should in fact be more open than Prado, especially after the description of the latter as a suburb to the town, and the former being further away from Melgaço. The only plausible explanation seems to me to be that Prado is in less need to exchange mates with the town because of its larger size, unless the proximity of Prado is actually a disincentive to population settlement, in that the townspeople of Melgaço would prefer to stay in Melgaço.

Melgaço and Remoães are the main recipients of genes into the area, and most probably the populations which are contributing most to the increase in spatial gene distribution. The former is an 'urban' parish, so differences between them are expected. The latter is a small parish forced to look for mates outside its boundaries. The rest of the parishes represent medium sized self-sufficient peasant communities.

#### *5.1.2.2 Distances Travelled (Appendix 2)*

In this section, BP distance refers to the distance between the birthplaces of the spouses, and RP distance refers to the distance between the residences of the spouses at the time of the marriage. Two calculations were made. One is the mean BP and RP distance, the average of all the distances for all the exogamous marriages, including the distance between the places of two exogamous partners.

The other calculation is the median distance of BP and RP. The calculation of the median is informative, for it has been argued medians reflect much better the distances over which genes are moving (Harrison and Boyce 1972; Mehrai 1984). Averages consider every distance, and just one large number can have serious effects on the mean,

which will appear 'inflated'. The use of the median overcomes this limitation. All distances were calculated as the crow flies (Chapter 2).

#### 5.1.2.2.1 Galicia

The endogamous tendencies of the Galician parishes (Table 5.1) are confirmed when BP and RP distances are considered. Again, the data divides the area into two zones: Arbo and Barcela in the east and Cequeliños and Mourentán in the west. It is interesting that such a division should be made by a geographical barrier, the Rio Deva, a tributary to the Minho.

Table 5.3 Average (mean) and median BP and RP distances travelled: Galicia

Parish	BP distance Km		RP distance Km	
	Mean	Median	Mean	Median
Arbo	2.9	0.0	2.5	0.0
Barcela	2.8	0.0	2.8	0.0
Cequeliños	6.4	0.0	5.2	0.0
Mourentán	5.4	0.0	4.9	0.0

The eastern parishes show a much lower mean BP distance, (2.9 km and 2.8 km for Arbo and Barcela respectively) (Table 5.3). These low averages are prompted not only by the high endogamy for each parish, but also by the extent of short range exchange. In Arbo 38.6% of the exogamous partners came from neighbouring Mourentán, which is only to be expected considering the village of the same name, which belonged to Arbo and Mourentán on alternate years, and parishioners could choose to marry in either one church or the other. Exchange with its two other neighbours accounts for 18.5% (10.9% migrants come from Cabeiras at 1.8 km and 7.6% from Barcela at 2.8 km). For Arbo, therefore 57.1% of exogamous partners come from distances below 2.8 km, which explains the low average (2.9 km). The pattern of exogamy in Arbo is predominantly *concello* endogamous.

Barcela also attracts short distance migrants, with Arbo, which is only 2.6 km away providing 23.3% migrants. The tendency for short distance migration is evident in the small proportion of exogamous partners travelling distances of more than 4.6 km (9.5%), and 84.8% of total movement is under 15 km and thus at the level of the *concello*. The tendency for parish endogamy and short distance migration is confirmed by the low mean (2.8 km) and the median (0.0 km).

Mourentán and Cequeliños both have higher means (5.4 km and 6.4 km respectively) than the other two parishes. However, the general trend toward parish

endogamy remains, and this is reflected by the medians (both of 0 km). For Cequeliños 79.0% of the movement happens within 3 km, despite a contribution from Arbo which is 4.5 km away. After 3 km there little migration (3.9%), until long distance migration is considered (17.1%), and it is this which explains the high mean value obtained. Long range migrants provide 5% of the exogamous partners.

The distance distribution for Mourentán peaks three times: at 2 km and at 4 km (which together account for 72.5% migration) and at 100 km (19.3%) (see Appendix 2). In other words, migrants into the parish are either short or long distance migrants. The two short distance peaks are no doubt provided by its neighbouring parishes Luneda (2.7 km), Arbo (2.8 km) and Valeije (4 km).

The distribution of RP distances shows how there is some movement prior to the movement made for marriage i.e. there is an intermediate point to which either the bride or the groom or both have moved to before getting married. This is important for it shows that the population does not move exclusively for marriage. All the means obtained are reduced when RP distances are considered. However, the fact that the medians remain the same means movement before marriage is the exception rather than the rule and probably refers to the intermediate movement of long rather than short distance migrants.

#### **5.1.2.2.2 Portugal**

The means for Portuguese parishes are, on the whole, higher than those for the Galician parishes, and only Alvaredo is comparable to them in mean BP distance. Paderne has means higher than those for Galician parishes but still lower than values for the other three Portuguese parishes. Average distances are above the 15 km threshold and as such do not represent movement with immediate neighbours (short range movement). These means could be overestimated if one considers the proportion of long distance migrants attracted by Melgaço which could have chosen to marry and move into the surrounding countryside. The values could also reflect the higher spatial exogamy of the Portuguese populations when compared with their Galician neighbours, and the much higher contribution of both exogamous partners to the exogamy rate.

Alvaredo's low mean and median (3.1 km and 0.0 km respectively) confirm the tendency for parish endogamy and short range movement described for its Galician neighbours. The low mean and median are also a reflection of the high proportion of migration under 5 km (95.2%) and under 15 km (97.4%) i.e. migration with its immediate neighbours and with parishes within a short range. The exchange with the neighbouring parish of Paderne (11.8% of total marriages contracted), only 2.4 km away and with whom it shares a district in common, can explain this limited movement. Furthermore, historically, Alvaredo was born out of Paderne, so that close genetic relationship is expected. Movement from parishes in the 2.3 to 2.5 km range, from the parishes of

Penso, to the west and Remoães to the east increase the isolation of the parish for genetic exchange occurs within a very limited geographical space. The situation of the parish far away from Melgaço would have reduced its attractiveness as a satellite of the town, and it is in the wrong place to be attractive for the upper valley populations. Distances between residences appear to confirm this fact, for there is only a very slight reduction (about 0.3 km) between BP and RP distance. The small difference between BP and RP suggests that there is little pre-marital movement apart from that associated with marrying itself.

Table 5.4 Average (mean) and median BP and RP distances travelled: Portugal

Parish	BP distance Km		RP distance Km	
	Mean	Median	Mean	Median
Alvaredo	3.1	0.0	2.9	0.0
Melgaço	20.9	2.6	17.1	1.4
Paderne	9.2	0.0	8.7	0.0
Prado	15.2	1.1	13.9	1.1
Remoães	16.5	2.3	16.9	2.3

Paderne's geographical position has contributed to its higher mean in comparison to Alvaredo (Table 5.4), although the values for both BP and RP are still lower than the ones for Melgaço, Prado and Remoães. The low median of 0.0 km points toward parish endogamy, and confirms the similarities between Paderne and its Galician neighbours across the river. 53.8% of the mates into Paderne are local mates, from neighbouring parishes. The position of the parish up the mountain and on the road from the upper valley to Melgaço has facilitated exchange with the upper valley populations: this contributes 6.5% migrants. There is also some movement from the eastern parishes of the *concelho*, those bordering with Orense (3.6% migrants) and from the Galician parishes from across the river (4.0% migrants). Paderne's geographical position has encouraged exchange with a wider variety of populations (10.4% exchange is with parishes within the *concelho* of Melgaço) whilst still retaining a very local migration pattern (in a similar way to Mourentán, which also has a privileged geographical position<sup>3</sup>). Long distance migration accounts for 13.8% total migration: 61.8% of that movement is by Galicians into Portugal from Orense and the rest (38.2%) is from Portugal.

The high BP and RP means for the other three parishes (Melgaço, Prado and Remoães) reflect the contribution of long distance migration into the area, for medians are

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<sup>3</sup>A privileged geographical position refers to the advantages for exchange provided by the central position of the parish in relation to its neighbours: both Paderne and Mourentán are surrounded by a larger number of parishes than the other parishes in the study and have been able to profit from a north-south axis for migrant exchange.

considerably lower, pointing toward an equally important contribution of short distance movement with neighbouring parishes to migration parameters.

In Melgaço, for instance 45.3% marriages are long range from other towns (Hiorns et al. 1973) like Vilanova de Cerveira, Valença do Minho, Viana do Castelo, Porto, Guimarães and Lisbon, but 44.2% movement involves an exogamous partner living locally at distances from the town of 1 km (Prado), 1.4 km (Roussas), 1.9 km (Chaviães), 2.1 km (Remoães) and 2.8 km (Paderne), its immediate neighbours (59.4% migration). The attraction of the urban centre for the surrounding rural populations is only to be expected, and has been reported for urban areas elsewhere (Küchemann et al., 1974 for Oxford and Roberts et al., 1981 for Carlisle). The movement is likely to be one way (Hiorns et al., 1973): from the rural to the urban prompted by an increase in employment opportunities. The mean and median values obtained for the parish reflect this dichotomy: the BP mean is 20.9 km (long), but the median is only 2.6 km (short). The values obtained for RP distances show a decrease in both mean and median (17.1 km and 1.4 km respectively), which suggests a tendency for pre-marital movement prior to displacement made exclusively for marriage. Such a tendency for pre-marital movement would presumably be a reflection of the high proportion of marriages that involve long-distance movement and/or of migrant couples. The only way the two partners could have met would have been through the pre-marital displacement of one or the other or of both. Evidence for the suggestion lies in the presence of servants in Melgaço, who travelled from their birthplace into Melgaço and met their spouse to be there. Marriages between servants were acknowledged as such in the parish registers, and the name of their employers and the home where they were working was noted. Most of these servants were Galician (males and females).

Prado follows the example set by neighbouring Melgaço, possibly because some of its exogamous partners were attracted to the town in the first place. Exogamous partners into Prado mostly move short distances with 59.4% of movement under 5 km, but there are also long distance migrants moving 50 km or more (35.6%). However, 64.4% movement occurs under 15 km. Such a situation has been responsible for the inflated mean value (15.2 km) for BP distance and the small median value (1.1 km) which is the distance between Prado and its three immediate neighbours (Melgaço and Roussas to the east and Remoães to the west). When RP distances are considered there is a slight decrease, suggesting premarital movement, but this is only very slight; in fact the medians remain the same at 1.1 km, which is the distance between Prado and Melgaço.

Exogamous partners to Remoães come mainly (75.8%) from distances of up to 5 km i.e the immediate neighbours, or long distances of 50 km plus (24.2%). There is no movement between 5-50 km. This is a peculiar distance distribution, similar to that of Melgaço, in which exogamous partners are either short or long range with no movement

in between. Most intermediate movement is in fact across the river, but the distances involved are still low, never exceeding 10 km if the crossing point is taken into consideration. This distribution has resulted in a high mean (16.5 km) and a relatively lower median (2.3 km). The median probably reflects the exchange with the neighbouring parish of Paderne, which provides 20.0% of exogamous partners and is situated at 2.3 km away. Their slightly larger RP mean distance (exceeding BP by 0.4 km) suggests there could be some movement by the inhabitants of Remoães out of the parish: couples are from the parish but meet elsewhere and then go back to Remoães to marry. Such an explanation can be sustained in the light of short range movement undertaken for agricultural reasons, so that whilst the future bride remained in Remoães the future groom could have a temporary residence in a nearby parish where he was helping in the harvest.

#### *5.1.2.3 Mobility of the Sexes (Figure 5.1 a) and b))*

In this section the contributions of the two sexes to spatial exogamy is examined. The most mobile sex need not be the agent of gene flow, and this section will help clarify which sex is engaged in spatial exogamy and which is the agent of gene flow.

##### **5.1.2.3.1 Galicia**

In all of the Galician parishes most of the exogamous partners are males, with Arbo showing the lowest tendency for this to happen (64.7% exogamous males) and Mourentán the highest (80.2%). Percentages of exogamous females vary accordingly, and since the contribution of migrant couples is low in all of the Galician parishes, the rest of the percentage is practically made up of exogamous females. Only in Cequeliños does the proportion of migrant couples increase enough to reduce the amount of male exogamy. The roles of females and males in Galician migration are very specific. Males are responsible for linking two spatially separated areas. However, because of the described patrilocal residence patterns (in Chapters 3 and 4) it is the bride who moves into the parish of the groom to live. Women will therefore act as agents of gene flow and it is the parish of the groom that will benefit from the exchange.

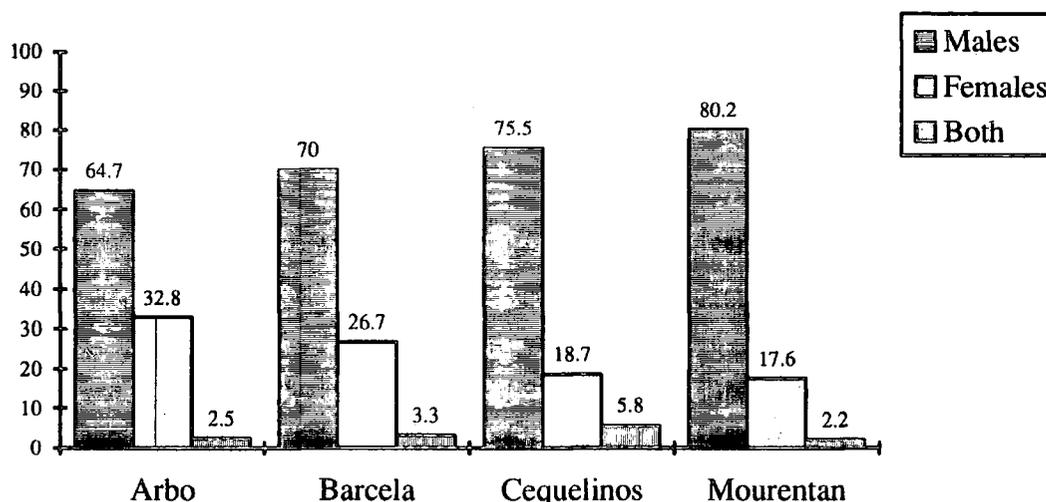
Figure 5.1a) shows the relative contributions of males, females and both exogamous partners to the exogamy of each parish. The parishes which have a higher proportion of female exogamy will be the ones to decrease their genetic isolation more quickly, if the argument above is to hold true. Arbo and Barcela, therefore, will open up to the outside more quickly than the other two parishes.

The low proportion of female exogamy in Cequeliños seems to be compensated for by the higher proportion of migrant couples, which makes up 5.8% of total exogamy,

the highest in the area. This would have had the effect of reducing the isolation of the parish, and the analysis of inbreeding and isolation confirmed this.

Mourentán's low proportion of both female exogamy and migrant marriages explain the very low admixture rate described above (0.082). Despite the higher exogamy in respect to the other parishes, most of this exogamy is introduced by males at the expense of females, the possible agents of gene flow. The admixture rate is in fact the lowest of the Galician parishes, and is in concordance with the high  $F_r$  and  $F_t$  values found (see sections 4.2.3.2 and 4.2.3.4).

**Figure 5.1a) Proportion of Exogamous Males and Females: Galicia**



The division of the data into two blocks is consistent with the analysis of distances travelled. Arbo and Barcela have lower BP means, but higher female exogamy whilst Cequelinos and Mourentán have the opposite. Women would appear to be short range movers, whilst men are engaged in movement over longer distances.

Indeed, 53.8% women travelling into Arbo for their marriage are short distance (less than 3 km) travellers, from Barcela (2.6 km away), and Mourentán (2.8 km away), while the rest are mainly medium distance travellers, with a few (5%) moving more than 50 km. This explains the median BP distance of 2.8 km, the distance between Arbo and Mourentán, which provides 41% exogamous females. The males fill in the gaps left by females, and contribute most long distance (50 km plus) migration. Their engagement in long distance migration increased their mean BP distance to 15.9 km, but their median is the same as that for females at 2.8 km, probably a reflection of the high contribution of Mourentán (51.9%) to male exogamy and the predominance of short range movement overall. The slight reduction in RP distance for males (0.7 km), lack of increase for females and constancy of RP median values for males and females suggests lack of

premarital movement had taken place for either either sex apart from the movement made exclusively for marriage.

Barcela's exogamous females moved further than the males, as the BP mean distances (7.1 km for males and 9.6 km for females) and medians (1.8 km for males and 3.7 km for females) demonstrate. The differences in the distances travelled by males and females lie in the contributions of the neighbours of either sex. Most male movement into Barcela is extremely local, distances travelled are 1 km (Sela, 30.9%), 1.6 km (Cabeiras, 19.0%) and 2.6 km (Arbo, 30.9%) ie. 80.0% movement is with immediate neighbours under 3 km. Females however are the long rangers, and 37.5% of movement is undertaken at distances of 50-100 km, although 25% involves a distance of only 2.6 km to the parish of Arbo. There is no difference between BP and RP distance for either males or females. It would appear from these results, that Barcela would play an important role in the breakdown of isolation of the area, with its higher female exogamy and proportion of long range women moving into the parish.

Cequeliños attracts more male than female exogamous partners, and they come from further away. Females tend to be more short range movers, from either Arbo at 4.5 km away (30%), Mourentán at 2.6 km away (20%) or Alveos at 1.6 km away (30%) ie. females come from the immediate parishes. Males however provide most of the long distance migrants (17.5% of total marriages involving an exogamous male), and all of the Portuguese mates into the area, whether from the parishes at the other side of the river or from the rest of Portugal. The high admixture rate and the low consanguinity and isonymy values found for the parish could suggest these men settled in the parish, maybe attracted by the non-paying status of the parish and plenty of agricultural work. There is no difference between BP and RP suggesting movement for marriage only. Given the low medians of only 2.9 km for males and 2.8 km for females this is not surprising, for betrothal and marriage took place between areas which were relatively close together, making pre-marital movement unnecessary.

Female exogamous mates into Mourentán travelled further for marriage in the parish than their male counterparts, and in terms of breakdown of genetic isolation, this could compensate for the very low female exogamy experienced by the parish. Females are engaged in long distance (over 50 km) migration more than males (27.3%) and of that percentage 33.3%, involve women from the rest of Spain beyond Galicia. It is probably these females that are responsible for reducing the differences between BP and RP in both mean (19.7 km and 7.3 km respectively) and median values (4.0 km and 2.8 km respectively), for their birthplaces are so far away some pre-marital movement was likely to have been more necessary than for local females.

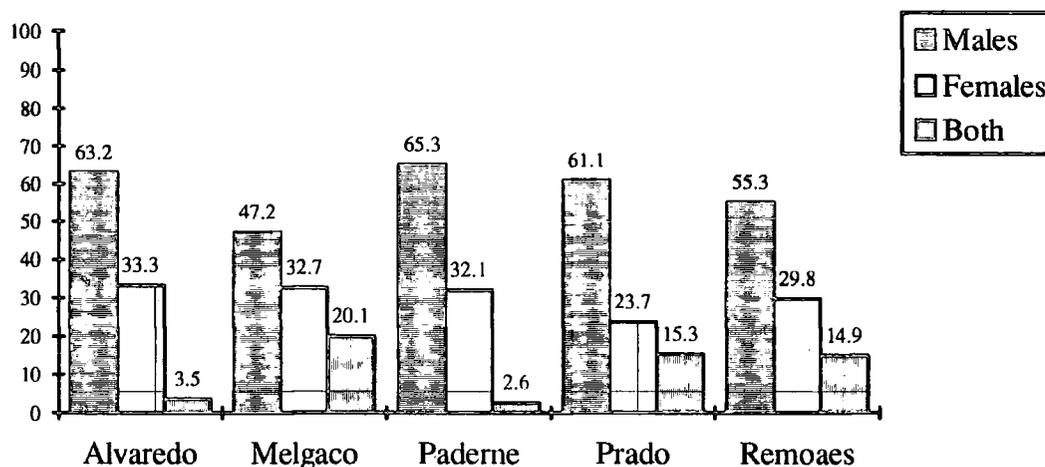
The heterogeneity of migration found in Mourentán is provided by male migrants into the parish, for they were engaged in movement along all distances (short and long).

Males make up all of the Portuguese migrants, and most of the migrants from neighbourhood parishes at 2.6 km, 2.7 km, 3.6 km, 4 km and 4.2 km (16.7%, 4%, 11.3%, 16.7% and 10% respectively), and there is quite a high proportion of migrants from long distances of over 50 km (16.7%). Means increase only slightly (by 0.5 km) and medians remain constant at 4.0 km, the distance with Valeije, a neighbour and, with Arbo, one of the two most important contributors to female exogamy (16.7%) (males from outside the parish). For males too, movement for marriage was all the pre-marital movement undertaken.

### 5.1.2.3.2 Portugal

In Portugal, there is also a tendency for males to move at the time of marriage to marry in the bride's parish, judging by the proportion of male exogamous mates into each parish (Figure 5.1b)).

**Figure 5.1b) Proportion of Exogamous Males and Females: Portugal**



Alvaredo and Paderne resemble the situation described for Galicia most closely: high male exogamy and low proportions of migrant couples into the parish. Because the patterns of residence in Portugal have also been described as patrilocal (Chapter 2), we must assume that here, as in Galicia, females will be the main agents of gene flow, despite the extent of exogamous male partners. However, the analysis of isonymy (Chapter 4) suggested that two of the parishes, Prado and Melgaço had in fact matrilocal tendencies. In the case of these two parishes, therefore, it is male exogamous partners who will be the agents for gene flow. Apart from being the agents of gene flow, males may also retain their "responsibility" in the linking of two spatially separated areas in two ways. The marriage of an exogamous male to a female from Prado or Melgaço may result from an encounter of the spouses to be whilst the male was helping in the harvest in the parish of the female (Prado) or had gone to Melgaço in search of employment opportunities outside

agriculture. Alternatively a male from outside these two parishes may have met a member of the family of his bride to be before he met the actual female in his own parish, if the former were engaged in agricultural activities in the parish of the exogamous male.

Hiorns et al (1973) acknowledged one of the ways of meeting the future partner for Oxfordshire women was through a member of their family, usually the fathers.

Figure 5.1b) shows the distribution of male and female exogamy for each parish and the distribution of marriages where both partners are exogamous.

Perhaps the most important difference between Figure 5.1a) (above for Galicia) and Figure 5.1b) is the increase in the contributions of 'both partners exogamous' (migrant couples) to total spatial exogamy except in Paderne and Alvaredo, and in this category Melgaço shows the highest value (32.7%), higher than most of the values for exogamous females in both Galicia and Portugal. The proportion of marriages in which both partners are exogamous is important for the breakdown of isolation of a parish if the couple decides to stay in the parish in which they have married, for they will contribute two, rather than one, sets of new genes. The low values for this category in Alvaredo and Paderne probably account for the higher isolation as reported in Chapter 4 and the low admixture rates outlined above.

The marriage processes involved in Alvaredo and Paderne resemble those of their Galician neighbours, and the similarities between these two parishes and the Galician parishes across the river was made clear when inbreeding and isolation were taken into account (Chapter 4). There is high male exogamy, low female exogamy and very low exogamy where both partners are from outside the parish. The distances travelled by exogamous partners is also similar. Male migrants into Alvaredo are predominantly short range movers. Most movement is from parishes on the 2-3 km away range, making up for 63.6% of total male movement. After 3 km the proportion of males involved in exogamous marriages with Alvaredo is very much reduced, and 92.5% of all movement occurs under 8km. This tendency toward short range movement is reflected in the low mean 5.9 km and median 2.6 km, both of which confirm the tendency toward localised movement. When RP distance was considered the mean decreased slightly by a mere 0.3 km, suggesting little pre-marital movement and confirming local movement. Females appear to move further away if the mean value is considered (8.6 km), and part of the reason could be the proportion of females coming from other *concelhos* (17.2%) and engaged in long distance migration (6.9% migration). This figure (3.6%) is higher than that reported for males. But these figures are misleading for they 'inflate' the mean. The median value of 2.5 km confirms this, and in fact points toward females as being equally short range movers than males. There is no difference in BP and RP distances for females, so that all the movement undertaken was for marriage.

Mean BP distances of females into Paderne are higher than for males (22.5 km for females and 16.2 km for males). The reason for this could lie in the higher proportion of long distance migrant females (30.2%) compared to males (17.1%). Males move shorter distances than females and provide most of the migrants from the neighbouring *concelho* of Monção (13.4%), and Galician migrants from across the river (4.0%). Despite the differences in migration distances for males and females BP medians are the same for both sexes (2.4 km), suggesting a predominantly local exchange for both females and males into the parish, and this is further supported by the high proportion of migration under 5 km (70.3% male; 60.5% females). There is no difference in the BP or the RP distances for females or males, suggesting pre-marital movement undertaken was for marriage.

The distances travelled by males and females to reach Melgaço testify to Melgaço's place as the 'urban' centre, for it attracts males and females from furthest away. The parish not only has the highest mean for males (30.6 km) of both Galicia and Portugal but also one of the highest for females after Remoães. Most importantly it has the highest medians for men and women (10.4 km and 10.7 km respectively). These high medians would have been considered as long distances for all of the other parishes, whether in Portugal or in Spain, especially if the high proportion of migration under 5 km is taken into consideration for parishes on both sides of the river, including Melgaço. Furthermore, Melgaço has the most marked differences between BP and RP distances in both mean and median values. Males provide short (under 5 km makes up 46.7% total exogamy) or long (over 50 km makes up 45.3% total exogamy) distance migrants, and intermediate distances (between 5 and 50 km) are infrequent (only 8%). The differences between BP and RP are large. Both RP mean and median values decrease to 26.5 km and 5.4 km respectively. The median itself is very important because it points towards a settling in Melgaço, or at least nearby, prior to marriage.

Female migrants into Melgaço come from a more heterogenous set of origins than do males. There is still some long range migration, but this is reduced to 39.2% and the contribution of short range migration remains more or less the same at 45.1%. The reduction in long-range movement is explained by the increase in medium distance travelling, mostly from the Galician parishes across the river (7.7% of total female movement). The differences in migration origins for females into Melgaço in comparison to males are confirmed in a similar, if reduced, mean of 24.2 km, and an increased median of 10.7 km. The increased median reflects the contribution of migrants from parishes across the river. The differences between BP and RP for females in both mean and median values is more obvious than in males (mean of 19.161 km and median of 2.6 km) suggesting females were most definitely resident in Melgaço or in the neighbouring parishes at the time of marriage.

The high admixture rate and low inbreeding levels found for Melgaço are the result, therefore, of a number of factors. One factor is the 'urban' character of the parish, which would have attracted a much wider variety of migrants from a much wider range of populations. This is specially significant for there is an important contribution of long distance migration to total exogamy. It is also important that there should be such a high contribution of migrant marriages; again a reflection of the 'urban' nature of the parish, for the wider employment opportunities would have attracted men and women alike. What seems significant to me is the contribution of male exogamy to the overall exogamy pattern. Although a lower proportion than in other parishes (47.2%), the proportion of male exogamy is still higher than that of female exogamy (32.7%) and of migrant couples (20.1%). Because the parish is predominantly matrilocal, the fact that there should still be a high male exogamy in relation to female exogamy is important, for the specific residence patterns may have prompted the males to stay in Melgaço.

Despite the similarities between Prado and Melgaço that became apparent in Chapter 4, the marriage patterns for the two parishes differ. Although there is also a high contribution of migrant marriages (15.3%) and of male exogamous partners into a Prado (61.1%) and high mean values reported (19.5 for BP and 19.4 km for RP), the parish has the lowest admixture rate. An explanation for this was provided above. Perhaps one other factor which could prompted the low admixture rate is the low median values of 1.8 km for males (both BP and RP) and 1.4 km for females, suggesting local movement and parish endogamy.

Male migrants into Prado are either short (under 3 km making up 69.4% migrants) or long (over 50 km making up 30.6% migrants) distance migrants with no movement between 3 and 50 km, suggesting the mean value is an overestimate, and that local movement predominates. The inflated average is in my opinion a result of having Melgaço for a neighbour. People are coming a long way, attracted to the Melgaço and not to Prado: they may never reach the town and settle in Prado or reach the town and then decide to marry in Prado. The first possibility has no support in the values found (especially in the low admixture rate and high isonymy values); the second could be right, but people are still using Prado to marry only and not to settle in. Female exogamous partners form a more heterogenous group, with some short (64.3% migrants under 5 km), some medium range (14.3% migrants between 5-50 km) and some long range migrants (21.4% migration over 50 km). Most medium range migrants are Galician women who come from across the river. This has had the effect of increasing BP distances, but medians are the same as with males, reiterating the place of short range movement on parish migration patterns.

There are more male exogamous partners into Remoães than female ones, which, in the light of the predominantly patrilocal residence pattern would appear as unexpected,

for it would appear that they would not stay in the parish after the marriage but rather take their brides home with them. However, the higher admixture rate for the parish and the lower inbreeding values, suggests some processes must be at work regarding mate choice. The first process encouraging a breakdown in genetic isolation could be a higher nuptiality in relation to population size for the parishes than in the other parishes. In a small parish increased nuptiality would have encouraged exogamy and in doing so, it would have led to a decrease in genetic isolation. The second process would have been for female exogamous mates into Remoães to stay in the parish after marriage, a situation which is not difficult to envisage in the light of patrilocal residence patterns. The proportion of females into the parish is in fact as high as, or higher than, in the other Portuguese parishes (Figure 5.2), and much higher than in the Galician parishes, and there is a half and half distribution between short, mostly from Alvaredo at 2.3 km (14.3%) and Paderne at 2.1 km (28.6%), and long distance migrants (35.7%) who would have introduced more different genes into the parish and increased the rate of isolation breakdown for the parish (Morton et al., 1976).

### 5.1.3 Summary: Galicia and Portugal

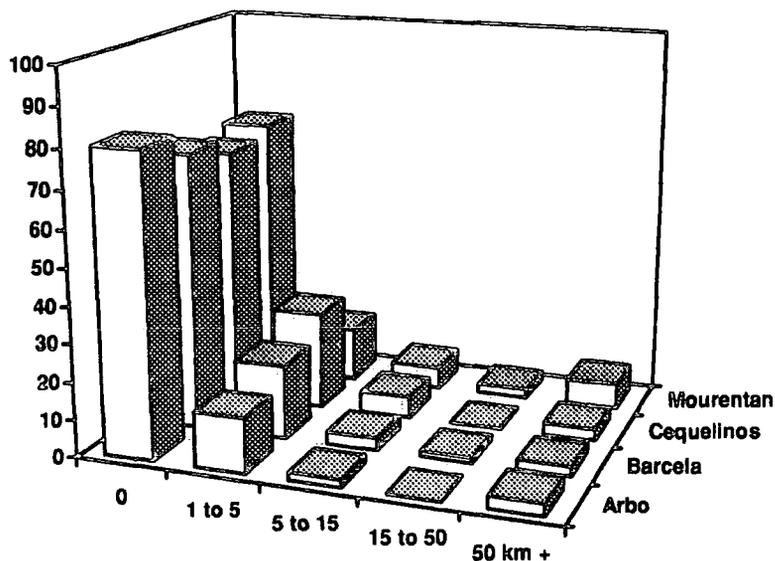
Figures 5.2a) (Galicia) and 5.2b) (Portugal) below summarise the evidence on the differences between the patterns of movement into Galicia and Portugal. It appears that the differences can be accounted for in terms of population level from which the Galicians and the Portuguese derived their migrants. Figure 5.2a) acknowledges a predominance of parish endogamy and movement from distances of up to 5 km in Galicia. In other words, for the Galician parishes, mates are derived either from one's own parish or from its neighbours i.e. the parishes are *concello* endogamous. After 5-15 km the proportion of migrants into the parishes in the study decreases, which would represent migrants from the *arziprestazgo*; in Mourentán the figure is highest, followed by Cequeliños. These two parishes are in a geographical position in which exchange with the other parishes in the *arziprestazgo* is possible. The geographical position of the former has been stressed above. The latter is only neighbour to one of the parishes in the *concello*, so its exchange with the parishes of the Archbishopric is expected. The sources of migrants from the 5-15 km range also include migrants from the *concelho* of Melgaço across the river.

Figure 5.2b) shows a different pattern of exchange. The pattern is one in which parish endogamy is substituted to a certain extent by exchange with immediate parishes on the 1-5 km range; the proportion of migrants from these distances is higher than in Galicia. The proportion of migrants from the rest of the *concelho*, which would represent the 5-15 km range (equivalent to the Galician *arziprestazgo*) varies for parishes, with

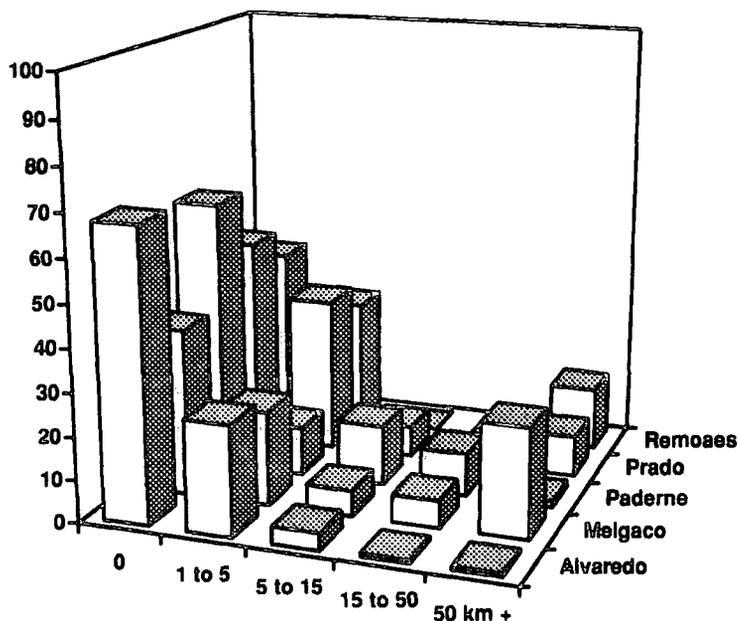
Paderne having the highest proportion. This is not unusual for its central position in the *concelho* would have opened exchange with a larger number of parishes.

Figure 5.2 Distances Travelled into the Region

a) Movement into Galicia



b) Movement into Portugal



Another main difference between Figure 5.2a) and b) is the proportion of migrants on the 15-50 km range, which reflects movement from the main towns in northern Portugal into Melgaço, which has the highest percentage of exchange. In Figure 5.2a) (Galicia), this movement reflects movement from Tuy and from Orense. It is interesting that Arbo and Cequeliños should have the highest percentages for this category. The latter's higher percentage results from migrants coming from Orense (see above). For the former, the higher percentage could reflect its position as the capital of the *concello*, which might have attracted people from the Diocese for municipal and religious duties.

Populations at either side of the River Minho behave as isolated, peasant communities where endogamy predominates and exchange is confined principally to short distances. The result has been mate exchange confined to neighbouring areas, giving a very limited and narrow geographical range to mate choice. The populations on the Portuguese side have had the relative advantage of an urban town growing next to them, which has prompted the presence in the area of long distance migrants. If these long distance migrants were to marry a local and stay in the parish where they married, then they would contribute a set of different genes to the parish, increasing the rate of breakdown of genetic isolation (Morton et al. 1976). If a long-distance migrant had chosen to marry another long-distance migrant and settle in the parish of the marriage, this would have contributed to the introduction of two new sets of genes.

Males make most of the exogamous mates into a parish and more long-distance travellers, confirming the role played by males in the linking of two spatially separated areas. However, the patrilocality of the area would suggest that it is females who constitute the agents of gene flow. Males and females are important for the genetic structure of the populations of the Minho River Valley in different ways.

## 5.2 ORIENTATION OF MARITAL MOVEMENT

### 5.2.1 Introduction

The study of marital distances demonstrated that there is a bias in the orientation of movement i.e. in the direction taken by exogamous partners at the time of marriage. Such a directional bias is a result of a variety of factors, of which local geography and population size differences (Boyce et al., 1967; Cavalli-Sforza and Bodmer 1971; Coleman 1977; Relethford 1986:1988) are the most important.

According to this principle, two neighbouring parishes will have unequal exchange if they have different population sizes despite the fact they are close to one another: the bigger parish will take less exogamous partners from the smaller parish, whilst the smaller parish will take most of its exogamous partners from the bigger parish. This situation forms the basis for the Central Place Theory model in geography (Coleman, 1977), which although not formulated in terms of marital exchange, does predict that people will be drawn for the provision of services to populations which are immediately above their own order of population size.

The Central Place Theory model has its counterpart in anthropology as the Gravity Model (Cavalli-Sforza and Bodmer, 1971), which proposes the same phenomenon i.e. net migration occurring along a population size gradient. The exchange of partners between populations which are of similar size is consistent with the Neighbourhood Knowledge model (Boyce et al., 1967). However, interconnectivity of populations (Lalouel and Langaney, 1976), distance (Morton 1973:1977; Wright 1943: 1951) and linguistic and cultural elements (Barbujani and Sokal, 1991) are also important to consider in this area where the River Minho has the dual role of geographic and political barrier.

This section will provide information on the direction, or orientation, of movement undertaken to contribute further evidence on the spatial patterns of gene flow and on the possible barriers to population movement. The provision of information on barriers other than geography that can affect orientation of movement and gene flow is necessary for this thesis, which aims at understanding the effects of both political and geographic barriers to population movement, and for this area, which has strong geographic barriers to gene flow and a political boundary dividing the region.

Figure 5.3 above indicates the main axes of movement along- which movement would have occurred in the Minho River Valley. These axes are marked in Figure 5.3 with the letters a. to g. It is necessary to clarify that this map is a modern map showing the modern roads.

Axis a. links the populations in the Minho River Valley with the south of the country via the old Roman road which connects Monção with Braga. Before reaching Braga, this road goes through Arcos de Valdevez and Ponte de Barca, two *concelho*

capitals and urban centres. From Ponte de Barca one could go to Viana do Castelo, the capital of the Minho province and the main centre for emigration to Brazil in the northern part of Portugal with Porto. It is also possible to reach Viana do Castelo by following the Minho valley through Monção and Valença do Minho (axis b.). This alternate route to Viana do Castelo was the "emigration/exportation" route. Once in Valença the river could be crossed to enter Galicia through Tuy (see section 3.1.4).

Movement into Portugal from Galicia was possible through the political point in Orense, in the village of Ponte Barxas (axis c.), following an east to west movement along- the river to Melgaço which could be continued to Monção and from there either south (a.) or west (b. above). Movement along- the river on the Galician side was also possible. Movement could happen west to east (axis d.) from Tuy to the parishes in the study. Alternatively movement could happen east to west (axis f.), from the province of Orense into Cequeliños. The crossing point over the Minho for this type of movement was at Frieira. Movement on a north-south axis into the parishes under study was thwarted by the presence of the mountain range characteristic of the valley. Movement into the Galician parishes was possible using axis e. following the valley of the River Deva through Mourentán. Movement from south to north into the Portuguese parishes could only happen through axis a. which would then would have had to follow on an west to east axis along- the river into Melgaço (axis h.). The upper valley populations in the *concelho* of Melgaço could have reached the town centre following the axis g., the road from Castro Laboreiro into Melgaço.

## **5.2.2 Results**

### **5.2.2.1 Orientation of Movement in Each Area**

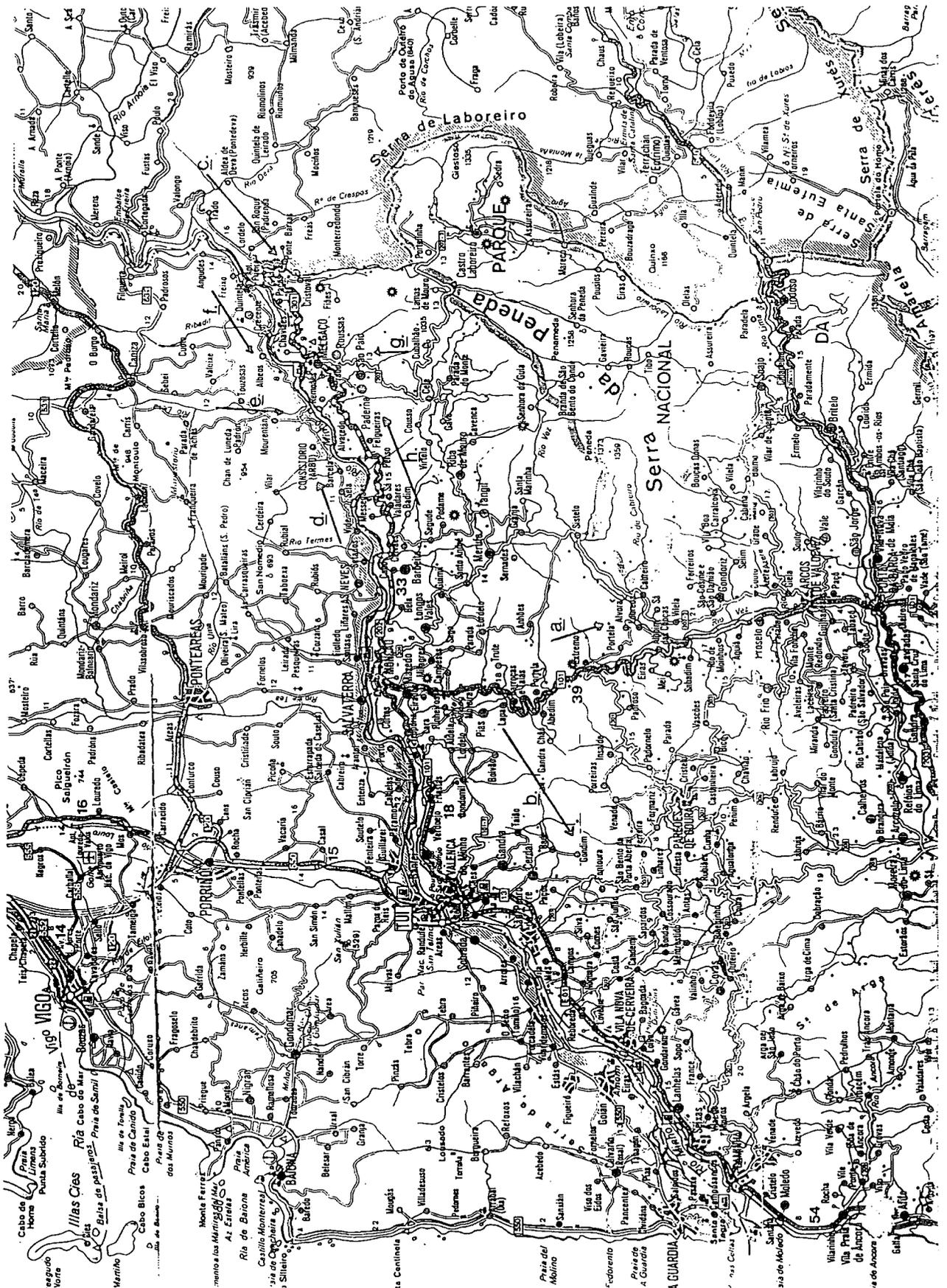
In this section the orientation of movement for each parish will be considered, and then for each area as a whole. Each parish will have a different orientation depending on its specific geographical location, and therefore a detailed study of the orientation of movement in each parish will allow us to understand better the constraints, mostly geographic but also those related to the political boundary that are individual to each parish, and to each area.

#### **5.2.2.1.1 Galicia**

In Galicia, the predominance of parish endogamy and short- range movement has created a very localised breeding group for the parishes considered, in which movement is directed around each parish. Parish exogamy thus involves those parishes immediately surrounding each parish. Migration asymmetry is a function of population size in the manner described above.

Figure 5.3 The Minho River as the political border between Galicia and Portugal

(see text for details)



Arbo is a predominantly endogamous parish, whose choice of exogamous partners is directed to either Mourentán (39.5%) or to the rest of the *concello* (26.9%), although it takes some migrants (8.4%) from Barcela. The important contribution of exogamous partners from the *concello* can be explained in terms of the amount of partners taken from Cabeiras, its neighbour, which on its own provides 48.3% of the migrants from the *concello* i.e almost half. Arbo's catchment area has a north distribution from Mourentán and Cabeiras mainly, but also from Luneda and Valeije (i.e. from the Archbishopric of San Martín) which provide a total of 58.8% of migrants. This movement is facilitated by the valley of the River Deva. Migrants from Luneda and Valeije have to move to Mourentán and then south following the valley into Arbo. Movement east is thwarted by the River Deva which provides the eastern border of the parish, and only 1.7% of the movement comes in from the east. Movement west is limited but present (10.1%), mainly because of Barcela. Movement south is limited by the River Minho, however, 3.4% movement occurs from Alvaredo and Paderne and a further 2.5% from San Payo and Roussas, Paderne's neighbours; a total of 5.9% of movement from the parishes across the river and immediately adjacent to the crossing point. The presence of the crossing point between Arbo and Paderne would have facilitated the exchange. The rest of Portugal provides some more migrants, but it is the rest of Galicia, from the nearby *concello* of As Neves, and from the Dioceses of Tuy that make the rest of migrants into Arbo (16.8%), giving the parish an overall pattern of movement with a very clear west (axis d. in Figure 5.3), northwest axis (axis e. in Figure 5.3) which is predominantly endogamous at the level of the *concello* (Table 5.5).

Table 5.5 Proportions of Exogamous Partners from the *concello* and the Archbishopric for Galician parishes

Parish	<i>concello</i>	Archbishopric
Arbo	60.5%	13.4%
Barcela	70.0%	5.0%
Cequeliños	22.6%	47.2%
Mourentán	24.6%	44.9%

Barcela is surrounded by three of the parishes of the *concello* of Arbo, and derives (70.0%) of its migrants from these parishes (Table 5.5), namely Arbo, Cabeiras and Sela, and only 6.7% of migrants come from the rest of the *concello* and the Archbishopric, suggesting a more localized pattern than Arbo. However, its relative closeness (about 3 km) with the parish of Vide in the neighbouring *concello* of As Neves has facilitated movement from the west; 6.7% partners come from parishes bordering with Sela (Vide

and Setados). Movement from the east is practically non-existent (1.7%): this could be a result of either distance or the blocking of the River Deva. Movement from the Portugal is slightly higher than in Arbo (6.3%), and 57.1% of that movement is from Alvaredo alone the Portuguese parish immediately opposite Barcela the river and close to the crossing point. Movement from the rest of Galicia is from the Diocese, giving a western axis (axis d. in Figure 5.3) to the movement into Barcela, which is also used evident in the contributions of its neighbouring parishes, and of the parishes in the next *concello*.

Cequeliños is not as *concello* exogamous as its neighbours (Table 5.5) but this is perhaps a function of it being bordered only by one of the parishes of the *concello*, Mourentán. Movement into Cequeliños is still localized, however, and 41.5% of its exogamous partners come from its two neighbours: Mourentán on its west and Alveos on its east. The rest of the *arziprestazgo* provides 18.7%, but this is basically the contribution made by Valeije (17.0%), a parish which is only 3 km away and which borders with the other two neighbours. If Valeije is taken into consideration as a neighbour, the percentage of contribution of neighbours to the parish increases to 58.0%. Movement from the rest of Galicia is mostly from the parishes belonging to the parish of Orense (15.0%), giving the parish a very clear eastern axis (f. in Figure 5.3). There is some movement from the south west, however, from the Portuguese parishes immediately across the river, and this makes up 14.0% of movement, with Melgaço (57.1% of the Portuguese migrants) acting as the main donor. That Cequeliños should have a much larger percentage of exchange with the Portuguese parishes in this study is surprising for it is situated furthest away from the crossing point. Two ideas come to mind. The first is that Cequeliños is equidistant from the crossing point at Arbo and that at Frieira which would have opened the parish not only to the Portuguese parishes but also to the Orensan parishes. Considering the proportion of migrants from these two origins, the crossing point at Frieira would probably have been used. There is very little movement from the west, presumably blocked by the River Deva, which would have impeded the use of the crossing point in Arbo. The second explanation is that the parish had a crossing point of its own, with the parish of Melgaço, immediately opposite Cequeliños across the river and the main provider of Portuguese migrants into Cequeliños. This is also a plausible suggestion, for there is evidence in the literature for the existence of a *estrada* (road) over the Minho River following from the chapel of Nossa Senhora da Orada, an important centre for the celebration of *festas* (Soares, 1875). There is no evidence of this road nowadays, but that does not mean it did not exist. Movement into the parish from 'other' places (rest of Spain) contributes a small proportion of migration into the area (3.8%).

Mourentán has the most ideal position for exchange, for it has more neighbours than any of the other Galician parishes and movement into the parish can be from either the northern parishes of the *arziprestazgo* or from the west (Arbo) and east (Orense).

There is movement into the parish from all directions, therefore, even from the south, for there is some movement into the parish from the Portuguese parishes under study (6.9%). Its geographic position allowed for the attraction of individuals from parishes belonging to the Archbishopric; movement has a north, northeast orientation and they provide 6.4% of exogamous partners. Most important seems the movement from other Galician Dioceses, both Tuy and Santiago, although there is some movement from Lugo and Orense (axis e. in Figure 5.3). This totals 19.8% of the movement, has a north, northwest orientation and provides most of the combined exogamy into the area (64.3% of the 'both exogamous partners' category). Movement from the 'other' category is present: 2.1% exogamous partners. In fact one of the partners in that category was a Mr. O'Dogherty Brown from Ireland!

#### 5.2.2.1.2 Portugal

The higher exogamy in Portugal promises a more interesting set of results, for despite the importance of short-range movement comparable to the Galician parishes, Portuguese parishes further enjoy the presence of an 'urban' town, which would have opened the possibilities for exchange from a wider variety of origins. However, the Portuguese parishes in the study have two important geographical constraints: the Minho and the mountain range, which would have assured movement along an east to west axis.

Alvaredo's exogamous mates are mostly from Paderne, its neighbour and the parish from which it was "born", and Penso, its other neighbour to the west. They make up for 34.5% and 12.6% of total exogamous partners respectively (47.1% total). If Remoães is considered a neighbour, and its short-distance of only 2.3 km (closer than Penso) probably makes it a neighbour, the total increases by 8% to 55.1%, situating the parish in the same league as its Galician neighbours. Most migrants into the parish come from the west (axis h. in Figure 5.3), from the *concelho* of Monção, which provides 12.6% migrants, and from Penso. There is 9.2% movement from the east, but, if we exclude Remoães, it consists exclusively of parishes in the study (Prado and Melgaço). Movement from Galicia, the north, is high: 13.8% from Arbo, Barcela, Cabeiras and Mourentán; i.e. exchange is with parishes immediately across the river from Alvaredo. The Galician movement into Alvaredo suggests the parish has two main axes of movement: and western one a northern one. The rest of Portugal contributes only 4.6% migrants, and the 'rest of Galicia' provides 3.5% migrants. There is no movement into Alvaredo from 'other places'.

Paderne has a much wider catchment area, presumably reflecting its ideal geographic location, which has made it interesting for both the riverine and the mountain valley populations. Although it borders with the Minho, the actual parish church is up the mountain, and the parish extends into the mountains and borders with some of the

mountain populations. The geographical position of Paderne is comparable to that of Mourentán in Galicia.

62.3% of movement into Paderne is from its seven neighbours, confirming the endogamy for the parish and its short--range movement. The rest of the *concelho* is also an important source for partners, and provides 13.4% partners. Of that percentage movement is primarily from the west and from the south (the mountain populations), providing 66.7% and 33.3% migrants respectively. Movement from the west is less important than movement from parishes belonging to the *concelho* (8.2%). Paderne's attraction for neighbouring parishes is probably a function of its large population size, and confirms its status as a provider of mates for smaller neighbouring parishes.

Movement into the parish from Galician parishes across the river is present but amounts to only 4.0%, lower than the figure quoted for Alvaredo above despite the presence of the crossing point. Movement from the rest of Galicia, is mostly from Orense and the parishes bordering with Portugal; it is equal to 8.2% and follows an east to west axis along- the river. Movement from the rest of Portugal is only 5.8%.

The other two rural parishes in Portugal, Prado and Remoães have very different patterns of orientation: the openness of the latter parish has resulted in the attraction of migrants from a much wider array of populations, whilst Prado shows some of the peculiarities described for Paderne, in particular the importance of the east to west axis of movement.

Prado's neighbours contribute to more than half total exogamy (59.3%). Melgaço and Sam Payo provide most of the exogamous partners, followed by Roussas, suggesting an eastern axis of movement for the parish (axis c. in Figure 5.3). Movement into the parish from other parishes is indeed from the east: 5.1% from parishes within the *concelho* and 19.5% from the eastern Galician parishes and from Orense which suggests the use of the political border by Galicians when they moved into Portugal, rather than the crossing of the Minho in the area: exchange with the parishes across the river is only 1.7%. There is very little movement from the west (1.7%) and some from the north (Galician parishes from the Archbishopric of San Martin to which the *concello* of Arbo belong-s) (5.1%). Portugal contributes the rest of exogamous partners (6.9%).

The parish of Remoães obtains its migrants from a wider array of populations than Prado, although immediate neighbours still provide the largest proportion of exogamous mates (30.8%). If Alvaredo, which is only 2.3 km away is taken into consideration, the proportion of migrants from immediate neighbours increases slightly, to 48.9%. The value is still low, but at least shows the importance of short- range movement in the parish, for approximately one out of every two migrants are neighbours. If the concept of 'neighbour' is applied to Melgaço, which is a mere 2.1 km away, then the value increases a bit more (53.2%) suggesting a very local selection of mates. Exogamous partners who do

not belong- to one of the parishes under study come mainly from Galicia. The parishes immediately opposite the river provide 14.9% migrants suggesting the use of the crossing point, given Remoães is only 1.1 km away from the crossing point to Arbo. Most important is the contribution of the rest of Galicia (17.0%), predominantly from Orensan parishes. In other words, migrants into Remoães are from either the immediate parishes or from Galicia, making it the parish with most Galician intake. Perhaps its small size and its proximity to the crossing point between Arbo and Paderne have resulted in these pattern of orientation. The pattern of movement into Remoães confirms the east to west axis of movement outlined above for Prado and Paderne. The rest of Portugal provides a very limited amount of migrants (4.2%).

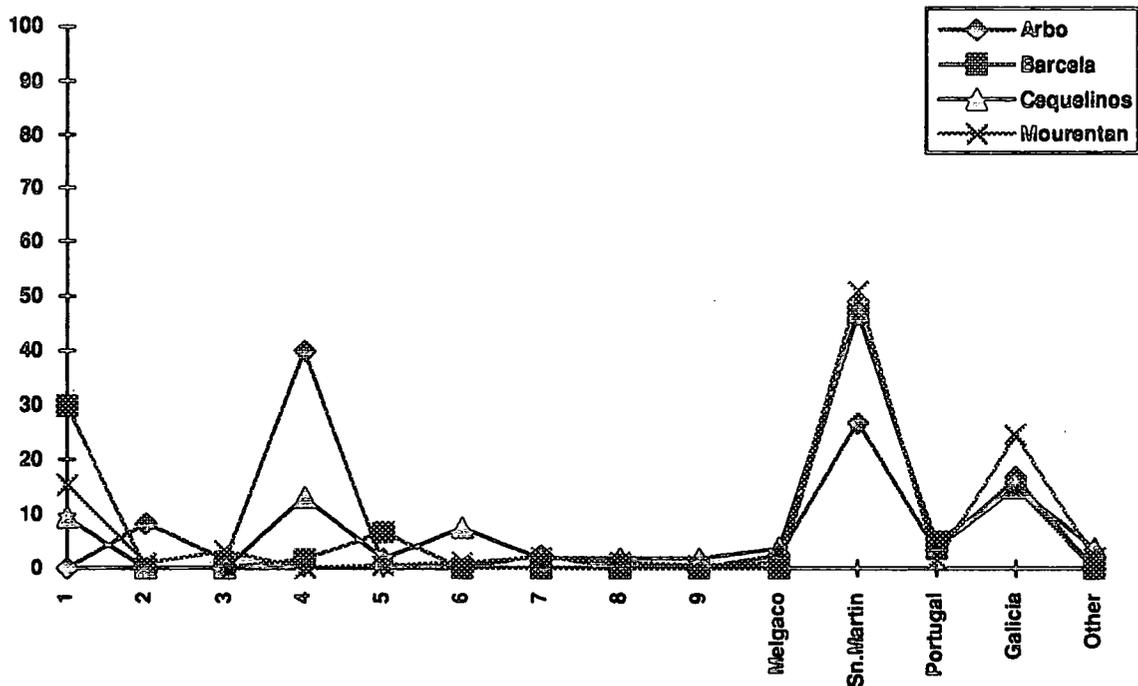
Melgaço is considered last because of its 'urban' nature, which sets it apart somewhat from its rural neighbours. Melgaço obtains only 22.0% of its migrants from Prado, Sam Payo and Roussas, its immediate neighbours. This figure is increased considerably by considering migrants from parishes within the *concelho* to 44.3%. Most of the movement within the *concelho* is from the east and south (19.9%) (axis c. and g. in Figure 5.3) compared to the west (2.2%) suggesting a pattern similar to that of Prado and Remoães. It attracts the riverine parishes to the east (Chaviães, Paços and Fiães) and the mountain valley populations of Parada do Monte and Lamas de Mouro to the south. Movement from the west is very much reduced, both in terms of that provided by eastern parishes within the *concelho* and from the next *concelho* along-, whose contribution is almost negligible (0.9%). Instead, the town attracts individuals from across the river (2.5%) and from Galicia at large (29.2%), mostly from Orense (26.8% of 'rest of Galicia' migrants). This makes Melgaço the most likely recipient of Galician genes and suggests movement happened from the east and to the west using the political border between Orense and Cristoval, and not the River Minho. The proportion of migrants from the rest of Portugal is also important (18.5%) but not as important as that from Galician parishes. This movement comes from the west and confirms the east to west axes along- the Minho, which is the only way to get to Melgaço from the rest of Portugal, the big towns along- the Minho (Valença do Minho and Vilanova de Cerveira) and the big towns in the south (Braga, Guimarães, Porto and Lisbon) and the southwest (Viana do Castelo, Arcos de Mouras, Ponte de Lima).

#### 5.2.2.2 Discussion

Figure 5.4 summarises the orientation of movement into Galicia as a whole. It is clear that most of the movement into the parishes is either from the parishes considered i.e. *concello* endogamous, or from the rest of the Archbishopric i.e. *arzobispado* endogamous, and there is another peak of migrants from the rest of Galicia.

**Figure 5.4 Orientation of Movement: Galicia**

(1=Arbo, 2=Barcela, 3=Cequelinos, 4=Mourentán, 5=Alvaredo, 6=Melgaço, 7=Paderne, 8=Prado, 9=Remoães)



The predominance of endogamy at the level of the *concello* is verified by the large percentages of movement from immediate neighbours into each of the parishes considered. Figures range from 41.5%, the lowest figure in Cequelinos to 80.5% in Arbo. However, the figure for the former is slightly misleading, for it only considers two neighbours, and the value is known to increase when movement from parishes in the *arzbispado* (e.g. Valeije) are included.

The axes of movement appear to be west and north west except for Cequelinos, with a clearly defined eastern axis for movement into the parish. The western axis is not altogether surprising. Movement from the south is constrained, if not completely hampered, by the River Minho, and so would be any other southern movement (south west and southeast). Southeastern movement would have been possible if the crossing point at Frieira was used, which probably explains the south-eastern axis for Cequelinos. This was suggested above. Movement from the north met no important geographical barrier, and neither did that from the west. In fact movement from the west was aided by the valley of the Minho, and movement from the north and northwest from that of the Deva. Some movement from the northwest was expected anyway, for it represents movement from the Diocese, and especially from Tui, the main religious centre at the time, which would have guaranteed good connections with the rural parishes.

The two other important peaks are Arbo and Mourentán themselves, for they act as a magnet for the other two parishes and reflect the movement between themselves.

The movement into the area from the Portuguese parishes varies, with the smaller parishes being more open to them (Barcela 11.7% migrants and Cequelíños 15.1% migrants), but this could be a function of their smaller population size. It is interesting that most of the movement should be with parishes immediately across the river, almost as if two independent crossing points existed. Arbo and Mourentán have lower proportions of migrants from the parishes across the border (5.9% and 6.1% respectively), despite their larger population sizes and their proximity to the crossing point. The two percentages are very similar, perhaps the result of the crossing point in the mixed district of Mourentán, whose parishioners could register births and marriages in either the parish of the same name or in Arbo indistinctively.

Exchange from the rest of the *concelho* of Melgaço and of the rest of Portugal is small in all of the parishes studied. The lack of movement into Arbo from the Portuguese parishes immediately across the border seems to be compensated by movement into the parish from the rest of Portugal, for it has the highest value testifying to such a movement (16.8%).

Movement from the outside world into the area is into Cequelíños and to a lesser extent Mourentán (3.8% and 2.1% respectively).

The River Deva seems important in deterring movement along the east-west axis, and the small exchange of migrants from Cequelíños to Barcela and Arbo and vice versa appears to confirm this fact. It is interesting also that the only eastern parish should appear furthest removed from the core: I consider the marriage patterns of Cequelíños to reflect its distance away from the centre of the *concello* at Arbo, which would have opened its movement to the next important municipal and religious centre and a *concello* centre at Crecente which is nearer than Arbo at 4.2 km and free of a geographical impediment.

The orientation of movement in Portugal reflects the presence of the urban centre at Melgaço which would have acted as a magnet for movement from a wider range of populations. However, the distance and orientation of the parish in question, its admixture rate, and its consanguinity and isonymy values prove that the importance of Melgaço lied in attracting migrants, but maybe not so much in keeping them there. I am tempted to suggest that Melgaço was a means to an end, a stepping stone to movement to the west and south, to Viana do Castelo, Porto and Lisbon for Galician, upper valley and riverine populations east of Melgaço, which would explain the east to west axis of movement for the parish and its immediate neighbours.

Figure 5.5 below shows there are three main peaks for the orientation of movement into the area: Paderne, the parishes belong-ing to the *concelho* of Melgaço and the rest of Galicia. There are also minor peaks at Alvaredo, Melgaço itself and the rest of

Portugal. Movement from the Galician parishes across the river appears as non significant.

Paderne is a receptor of migrants because of its location, which would have attracted migrants from both the riverine populations under study and from the upper mountain valley populations. This is explained in more detail above. The contribution of migrants from the rest of the *concelho* can be understood in the context of the amount of migrants from those parishes which moved into Paderne, Melgaço and Prado. These migrants were from the south (upper valley populations) and were either attracted by the pull of the growing town or by the possibilities to join in the east to west trail to other populations. The absence of roads for the upper valley would have meant migrants would have had to go down to the river through Paderne, and then choose their direction of travel: either east to Melgaço and Galicia, or west to Monção and from there to the rest of Portugal.

The peak composed of migrants from Galicia is made of individuals from the province of Orense which suggests an east to west movement along the river. These migrants could have been attracted by either Melgaço as a town (see Figure 5.10) or to the possibility of joining on the main axis to Viana do Castelo and other Portuguese towns (Porto and Lisbon), which were important destinations for those individuals involved in cyclical migrations. The movement from Galicia is considerable for all parishes, with the possible exception of Alvaredo, but since this movement is from the east and not from the north it is logical to assume the River Minho was acting as a disincentive to movement. This conclusion is supported by the low contribution of migrants from parishes 1-4 (Galicia) in Figure 5.4 and 5-9 (Portugal) in Figure 5.5. The low proportion of migrants from the nearby *concelho* of Monção once again confirms the east to west movement, for there is little movement from the west, or it could reflect the pull of Melgaço as a growing urban centre. The west to east axis is more easily detected if the individual parishes are taken into account.

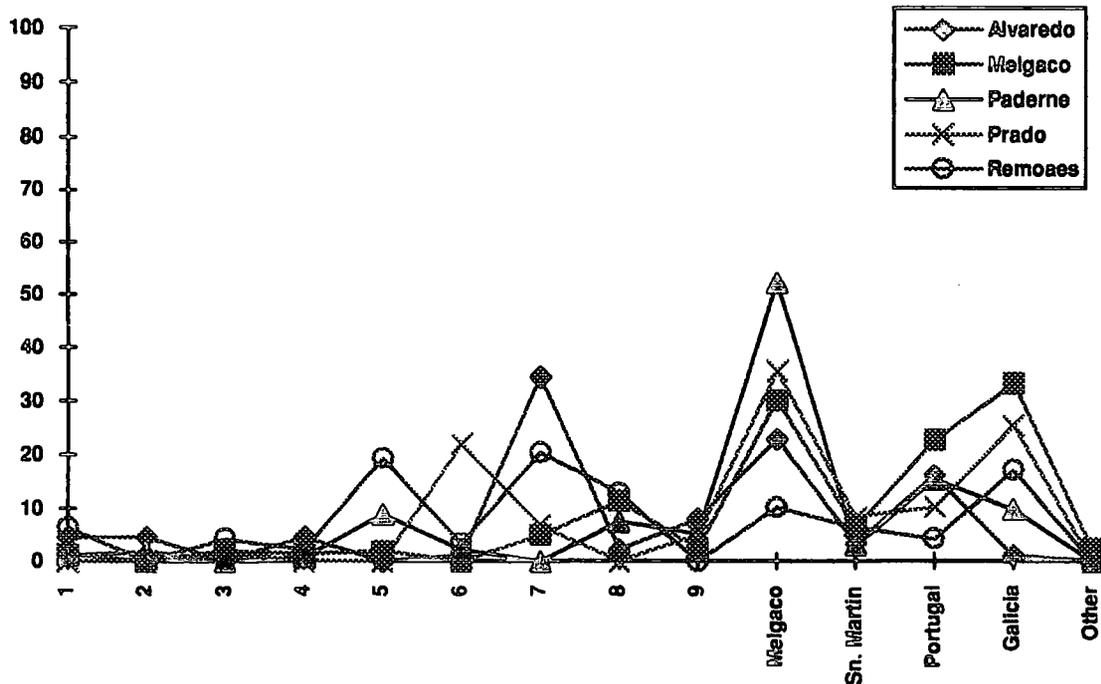
The movement patterns for Portugal show the importance of the main road from Melgaço to Viana do Castelo for both Portuguese migrants in the area and Galicians alike, for it was this road that opened the opportunities of movement to the rest of Portugal.

The peak at Melgaço itself is formed almost exclusively of migrants from Prado, and Figure 5.5 shows a much more important peak at Paderne. In other words, Paderne is providing more of a pull for surrounding populations than Melgaço. A plausible explanation is that the migrants were primarily engaged in agriculture which would have reduced the economic attraction of an urban centre such as Melgaço. Otherwise, the smaller peak for Melgaço would represent the phenomenon indicated by Hiorns et al. (1973) in which an 'urban' centre would tend to derive migrants from another 'urban' centre, and exchange with neighbouring agricultural communities would have been very

much reduced. This suggestion would also explain the peak for Melgaço in the 'rest of Portugal' category (Figure 5.5).

Figure 5.5 Orientation of Movement: Portugal

(1=Arbo, 2=Barcela, 3=Cequeleños, 4=Mourentán, 5=Alvaredo, 6=Melgaço, 7=Paderne, 8=Prado, 9=Remoães)



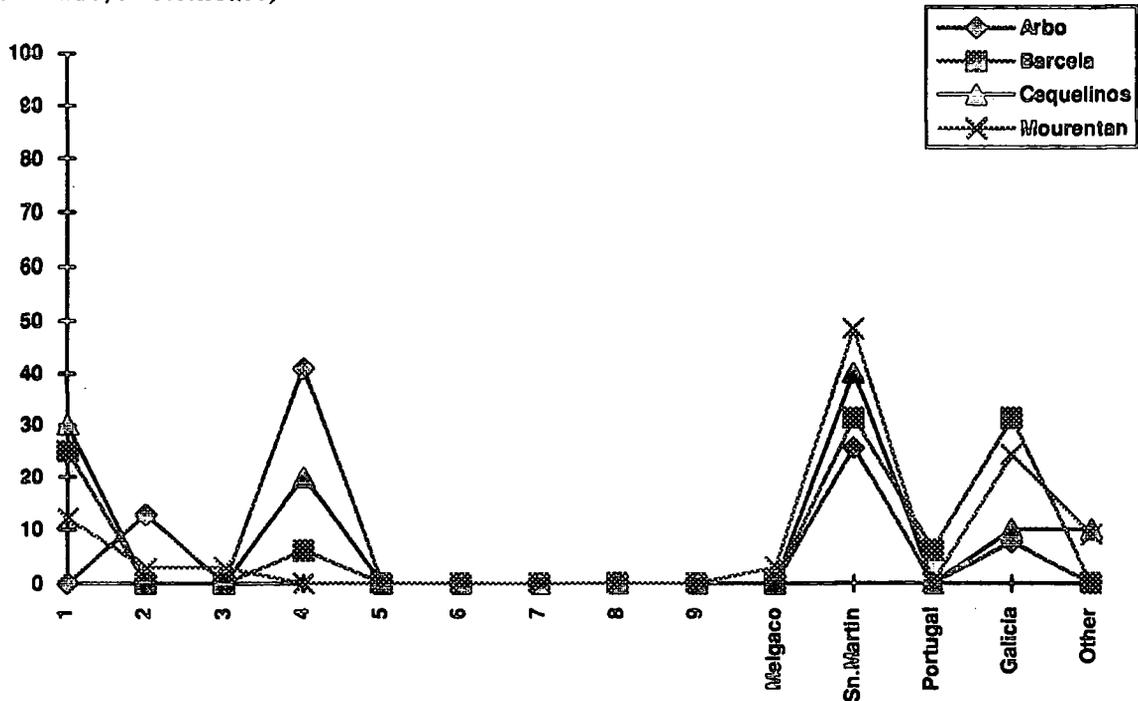
The proportion of migrants from the parishes which form the study or from the *concelho* of Melgaço is important enough to confirm a tendency for short-range movement and endogamy at the level of the *concelho*. This is equivalent to the peak in Galician orientation from the rest of the Archbishopric, which confirms the need to consider the Galician *arzbispado* as a similar population unit to the Portuguese *concelho*. If the two population units are to be considered as similar, the pattern which emerges for the area is one in which short-range movement and parish endogamy reign, within the *concelho* and the *arziprestazgo*.

Figures 5.6, 5.7, 5.8 and 5.9 show clearly the low proportion of migrants that marry across the river, confirming the importance of the Minho as a geographic barrier. Most movement is undertaken by males (Figures 5.7 for Galicia and 5.9 for Portugal), and especially Galician males. That there should be more movement by Galicians into Portugal than the other way round is perhaps not surprising in the light of Galician seasonal movement (*galegos*) as explained in Chapter 3. The implications of this asymmetry of movement are considered in more detail in Chapter 6.



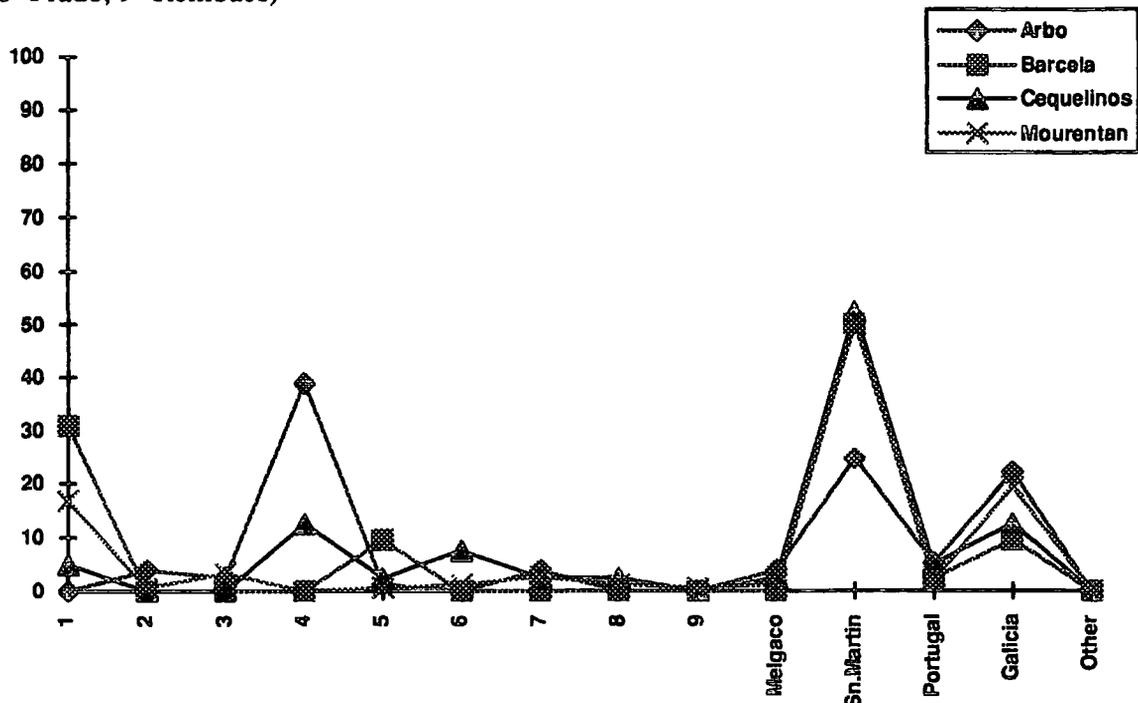
**Figure 5.6 Female Orientation of Movement: Galicia**

(1=Arbo, 2=Barcela, 3=Cequeleños, 4=Mourentán, 5=Alvaredo, 6=Melgaço, 7=Paderne, 8=Prado, 9=Remoães)



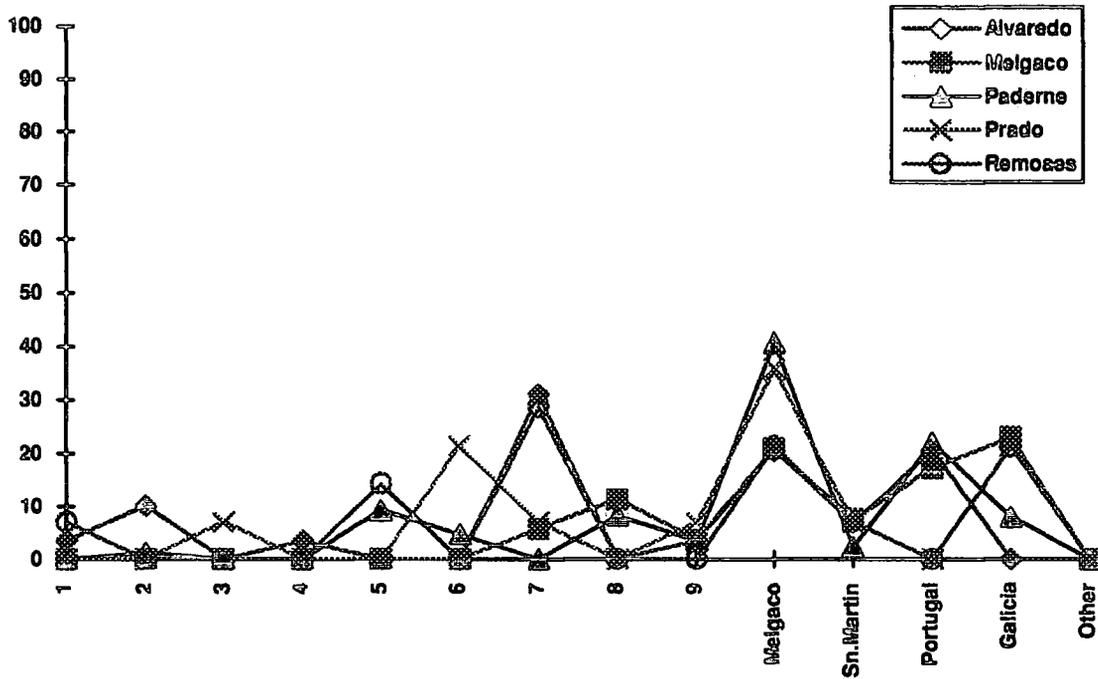
**Figure 5.7 Male Orientation of Movement: Galicia**

(1=Arbo, 2=Barcela, 3=Cequeleños, 4=Mourentán, 5=Alvaredo, 6=Melgaço, 7=Paderne, 8=Prado, 9=Remoães)



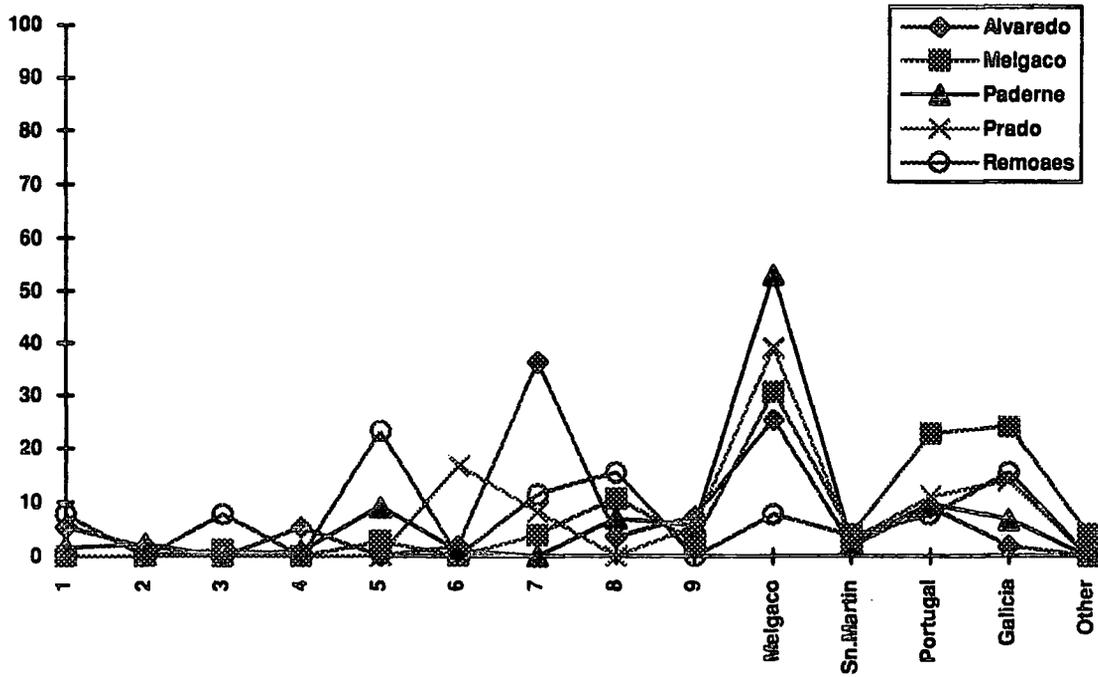
**Figure 5.7 Female Orientation of Movement: Portugal**

(1=Arbo, 2=Barcela, 3=Cequeliños, 4=Mourentán, 5=Alvaredo, 6=Melgaço, 7=Paderne, 8=Prado, 9=Remoães)



**Figure 5.8 Male Orientation of Movement: Portugal**

(1=Arbo, 2=Barcela, 3=Cequeliños, 4=Mourentán, 5=Alvaredo, 6=Melgaço, 7=Paderne, 8=Prado, 9=Remoães)



Despite the little movement by males and females into Galicia from Portugal and the other way round, in the movement across the Minho two trends are apparent.

The first trend is the exchange between Barcelá and Alvaredo. This peak is produced by Portuguese females from Alvaredo into Barcelá (Figure 5.7) and by Galician males from Barcelá into Alvaredo (Figure 5.8). The exchange between Alvaredo and Barcelá could have had an economic dimension to it. Movement across the river at this point appears gender related: there are males moving into Alvaredo and females moving into Barcelá but not the other way round.

The origin for such gender-related movement could lie in the absence of males from the Portuguese parishes in either seasonal or cyclical migration but could also represent permanent emigration, which would have deprived parishes of a supply of male mates and unequal sex ratios. We know that Galicians are involved in seasonal migrations into Minho, which would have allowed for the meeting between the Galician male and the local Portuguese female.

It is also worth noticing that all of the Portuguese movement into Mourentán is undertaken by both females and males from Alvaredo, suggesting Alvaredo's proximity to the crossing point in Paderne.

The second trend refers to exchange of Cequeliños with Melgaço, Prado and to a lesser extent, Remoães (Figures 5.7 and 5.8). This is difficult to account for, but it was suggested above that there might have been a crossing point with Cequeliños from Melgaço via the road which led to the sanctuary at Nossa Senhora da Orada, a pilgrim centre for the celebration of *festas*.

### 5.3 THE RIVER MINHO: A GEOGRAPHIC OR A POLITICAL BOUNDARY?

Data on the orientation of marital mobility of the populations studied confirms the existence of a geographical barrier to population exchange which has forced movement along- the River Minho and has reduced interchange across it.

The importance of the river as a geographical barrier can be deduced from the low contributions of migrants into the two areas from parishes immediately across the river, and in the higher proportions of migrants from the 'rest of Galicia' into Portugal and the 'rest of Portugal' into Galicia. This type of exchange would suggest movement took place either across the river at Tuy or across the political boundary in Orense. Furthermore, despite the extent of short-range movement, increasing the distance travelled seems to be preferred to crossing the river. Evidence that the river was indeed crossed comes from the presence on each side of the river of parishioners from the other side: it is even more interesting to notice that most movement is made between parishes which are immediately opposite each other across the river. It seems improbable that the crossing took place anywhere else along the river (at Tuy which is 25 km plus away) or at the political border in Orense (at over 10 km of distance) when settlement took place immediately opposite the parish of origin. For example, movement into Barcela is from Alvaredo only, movement into Prado is from Cequeliños only, movement into Arbo is from Paderne only, and so on (for more details see Figures 5.4 to 5.9 and text above).

**Figure 5.10 Exchange Across The River Minho**

(1=Arbo, 2=Barcela, 3=Cequeliños, 4=Mourentán, 5=Alvaredo, 6=Melgaço, 7=Paderne, 8=Prado, 9=Remoães c.p.=Crossing Point)

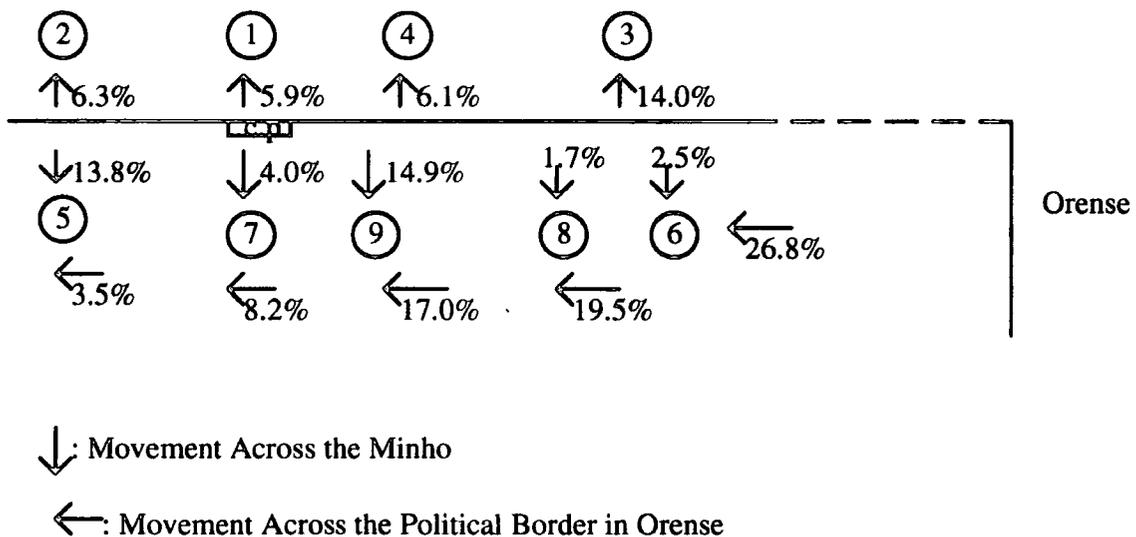


Figure 5.10 takes into consideration the two types of exchange which could have taken place between the parishes in the study. Percentages represent the proportion of

migrants into the parishes in the study: for example, 13.8% of all exogamous partners into Alvaredo come from across the parishes across the river.

The first type of exchange considers movement across the Minho, using the crossing point between the parishes of Arbo and Paderne. Results on this type of exchange help to evaluate the importance of the river as a geographic boundary. The second type of exchange in Figure 5.10 considers movement along the Minho by Galicians into Portugal, which would have used the political border in Orense and takes into account migrants from Orense and Lugo into the *concelho* of Melgaço.

The distinction of the two types of movement is necessary. It was assumed that the dual role of the River Minho as a geographic and political barrier could be assessed if movement across the political border at Orense, once it has separated from the Minho, was taken into account, for then the Minho could be considered as a geographic boundary alone.

The percentages of exchange and, most importantly, the direction of exchange across and along the river has divided the area into two blocks: which represent the areas east and west of the crossing point between the parishes of Arbo and Paderne (c.p in Figure 5.10). Most exchange across the river takes place in the area west of the crossing point i.e. between Barcela, Arbo and Mourentán in the Galician side and Alvaredo and Paderne in the Portuguese side. Remoães is east of the crossing point, but only 1.1 km away from it. This geographical proximity coupled with its small population size would explain the high proportion of migrants from across the river. In fact, the parishes of Alvaredo and Remoães are closer to the crossing point (1.5 km and 1.1 km respectively) than most of the villages in Paderne, which are much further up the mountain, nearer to the parish church.

Prado and Melgaço are displaced from the crossing point and have much lower percentages of exchange (1.7% and 2.5%) respectively. Most importantly, movement into these two parishes is not from the parishes around the crossing point but from Cequeliños, which is also displaced to the east and immediately opposite Prado and Melgaço across the river. All of the movement into Prado and 50% of the movement into Melgaço comes from Cequeliños. The possibility that a crossing point existed in Cequeliños was suggested above. Alternatively the high exchange with Cequeliños may point toward the proximity of the parish to the crossing point in Orense.

Figure 5.10 also considers movement into Portugal by the Galicians using the political border in Orense, and it is interesting that the area should also be divided into two blocks, with a decrease in proportions of migrants along the Minho happening from east to west: the parishes east of the crossing point have higher proportions of migrants from Orense than from the parishes west of the crossing point. Melgaço appears to have a "filtering" effect for this type of movement, and percentages of movement along the

Minho for the Galicians into Portugal fall as one moves away from the town. In fact, percentages of exchange along the Minho decrease as percentages of exchange across the Minho increase.

Two conclusions can be made. The first is that there is, on the whole, more movement along the Minho, suggesting individuals cross the political border in Orense more often than they cross the river. The second conclusion is a corollary of the first, for crossing the river is more frequent in parishes closest to the crossing point. Even then, only in Alvaredo is the percentage for movement across the river (13.8%) higher than movement from the political border (3.5%).

The differences in the percentages of movement across and along the Minho for Galicians into Portugal can be due to two factors. The first factor to consider is the pull of Melgaço which is evident in the "filtering" effect of the town for migrants crossing the political border in Orense. As one moves away from the town percentages decrease, suggesting that migrants were attracted to Melgaço in the first place, perhaps with the wider employment offers or as a measure by the Spanish government to keep Galicians in the town as a form of defence (see Chapter 3). Dissilusionment if lack of employment opportunities were encountered might have prompted the movement away from the town into the countryside where the migrants could engage themselves in agriculture (*galegos*).

Exchange across the river could represent a different type of migratory movement. The lower percentages of movement across the river might represent movement made for agricultural reasons to agricultural parishes (seasonal movement to help in the harverst for example), after which migrants would return to the parishes across the river to their parish of birth without marrying.

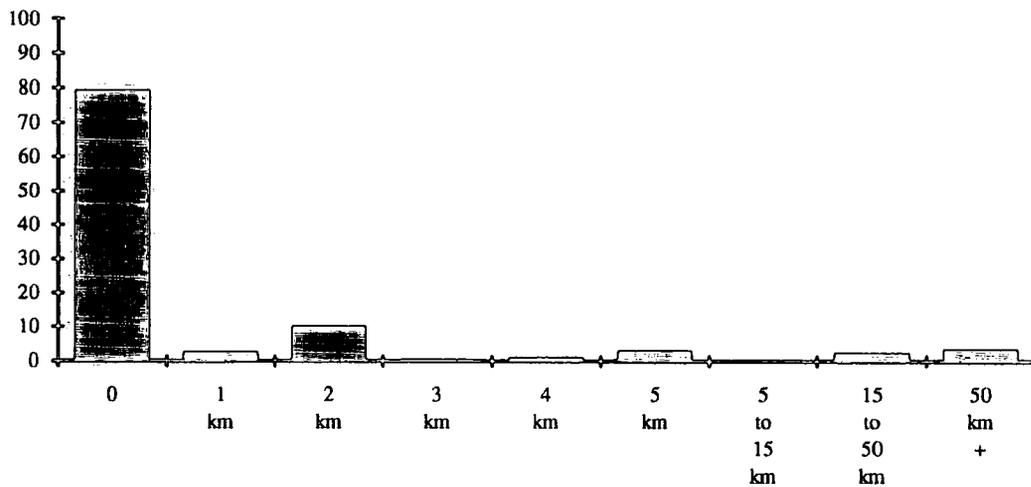
Even if these considerations are borne in mind, exchange across the river is still higher for those parishes close to the crossing point, which suggests that if the river had been easier to cross or if there had not been any river whatsoever, then movement would have increased significantly. The high percentages of marriage along the political border in Orense is further evidence that the movement of Galicians into Portugal was an accepted type of movement, and was not deterred by the presence of the political barrier. Furthermore, there is evidence in the literature (Meijide Pardo, 1960) that the extent of movement across the political boundary was subject to immigration control and specific laws prohibiting movement. Despite the strict control the movement across the political border in Orense, and the Minho was still present.

In the light of these data, it is perhaps adequate to conclude that the importance of the Minho as a political boundary is undermined by its more important role as a geographic barrier to population movement and gene flow.

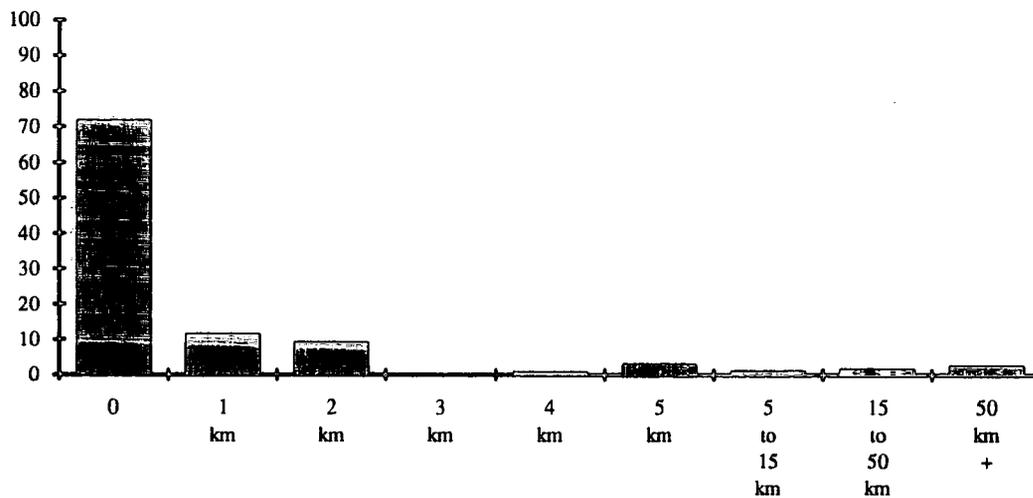
Appendix 2  
FREQUENCY DISTRIBUTIONS (DISTANCES TRAVELLED)

I. GALICIA

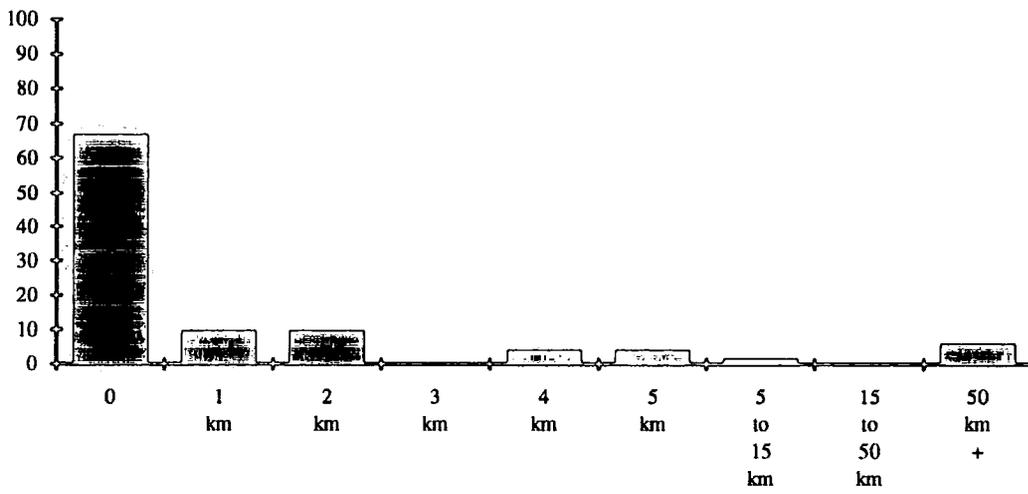
1. Arbo



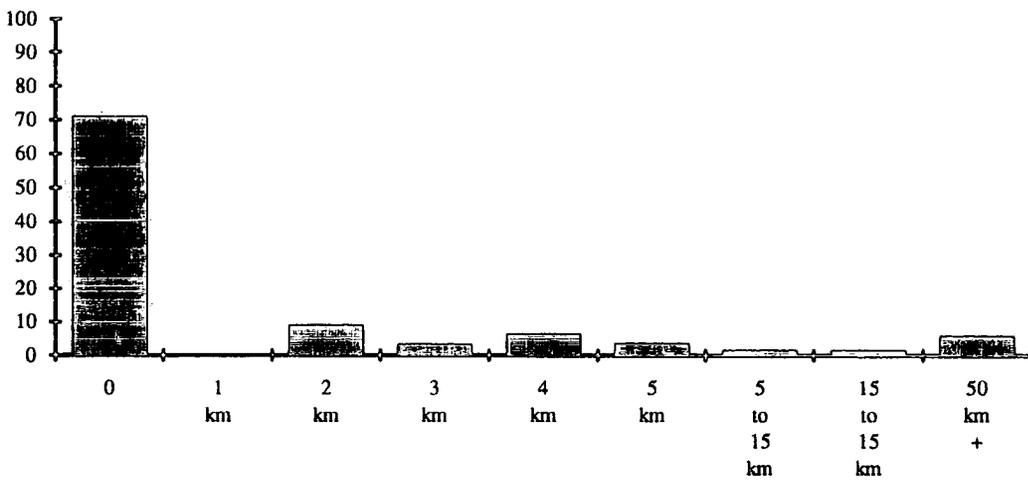
2. Barcela



### 3. Cequelinos

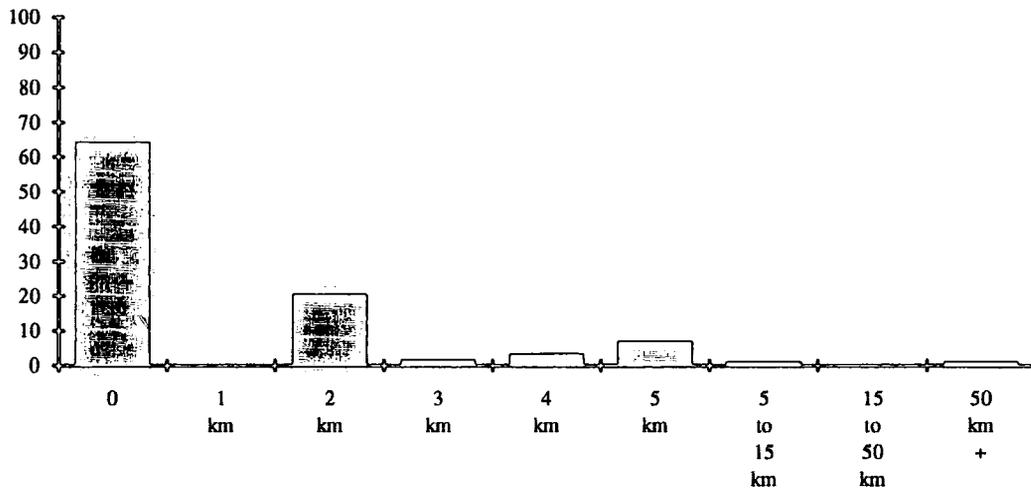


### 4. Mourentán

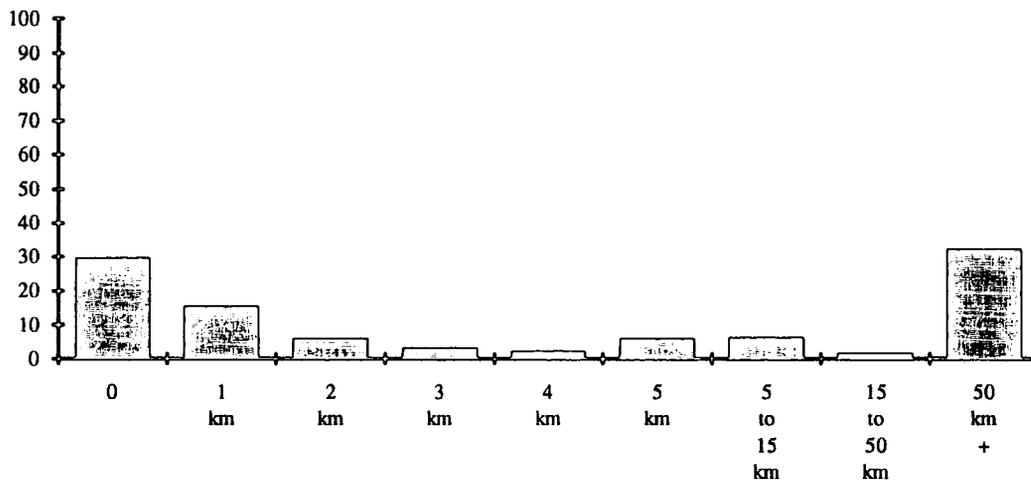


## II. PORTUGAL

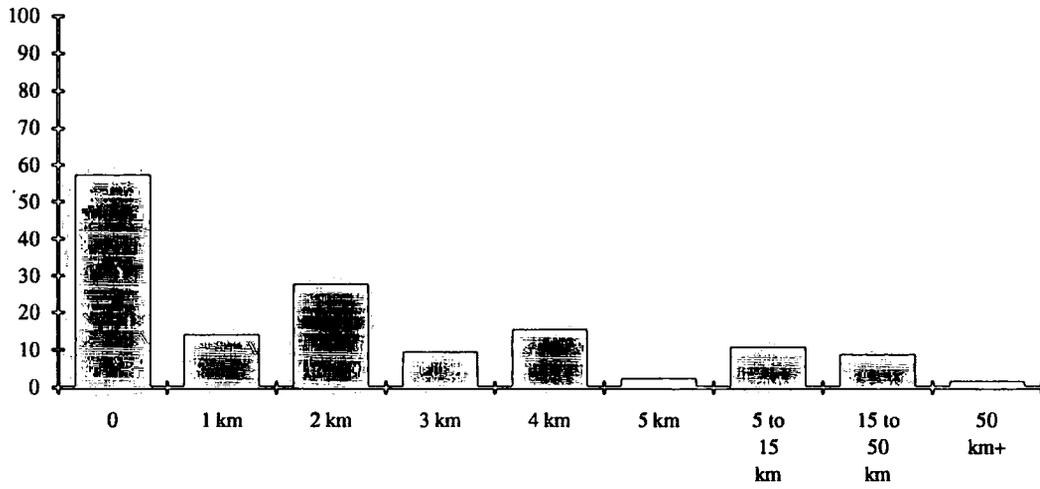
### 5. Alvaredo



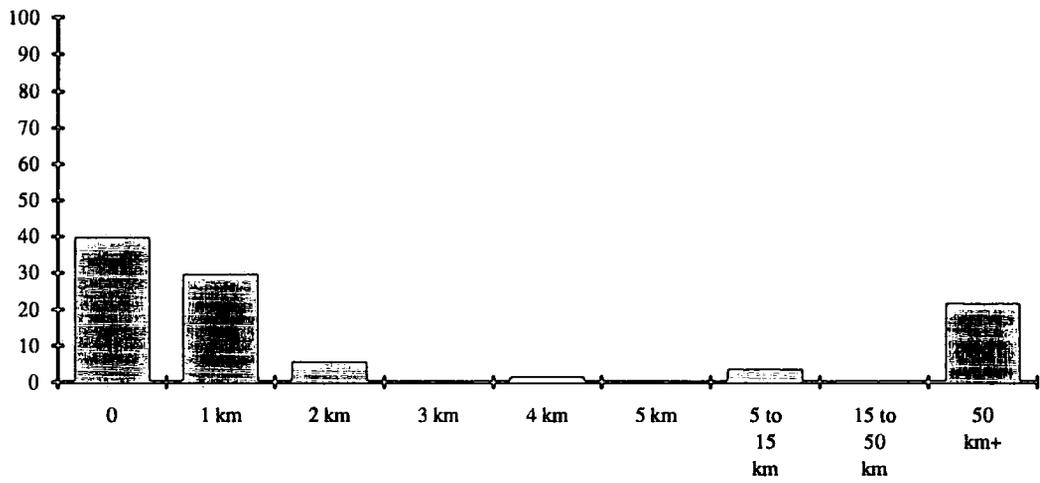
### 6. Melgaço



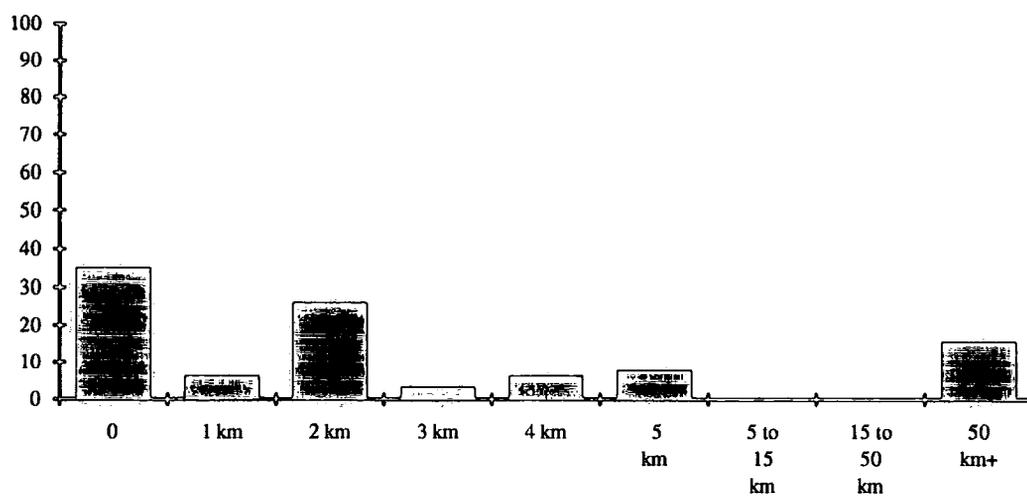
7. Paderne



8. Prado



## 9. Remoões



## Chapter 6

### DISCUSSION AND CONCLUSIONS

The populations of the Minho River Valley are behaving in very similar ways with regard to mate choice and marital mobility, and this has had important effects on their genetic structure. The similarities between populations at either side of the river was expected to a certain extent, as they share similar geographic and socio-economic constraints experienced by the Minho Valley as a whole and described in Chapter 3. However, the Minho is also a political boundary and this could have had the opposite effect, that of making populations at either side of the river so different it would have stopped population exchange. Through time the two sets of populations would come to represent the two different countries to which they belong. After all, is this not supposed to be the purpose of a political boundary?

There is indeed some degree of homogeneity within the populations under study, perhaps with the exception of Melgaço. All the populations, regardless of which country they belong to, are isolated patrilocal agricultural communities with high inbreeding levels, low admixture rates and a predominantly local pattern of mate choice where short range movement and parish endogamy predominate.

Despite this apparent homogeneity an examination of the marital mobility and genetic structure of each parish reveals differences between the populations at either side of the river. Such disparities are important as they reflect the presence of a political boundary in the area.

In this chapter I will review the evidence in favour of the importance of the River Minho as a geographic boundary for the parishes under study, but will also attempt to evaluate the extent to which the river has behaved as a political boundary to population exchange and homogenization.

The parishes which form the core of this study are all agricultural communities with the exception of Melgaço, which at the time of the study was a thriving 'urban' centre providing an economic pull for the peasant populations around it and for more distant places. The difference in the economic realities of these two different types of communities has divided the data into two very clear blocks: one made up exclusively of Melgaço and the other which contains the agricultural communities.

The agricultural communities are characterized on the whole by high inbreeding levels, confirming a certain degree of genetic isolation. Inbreeding coefficients were calculated using dispensations and isonymy. The Portuguese parishes appeared as more isolated genetically, with lower frequencies of consanguineous marriages but higher  $\alpha$  (mean coefficient of inbreeding) levels. Such levels were the result of the higher proportion of first cousin marriage in the Portuguese parishes. The differences between

the Portuguese and the Galician parishes was explained in terms of different land inheritance patterns, land ownership and nuptiality, including pre-marital movement to marry a relative.

In Chapter 5 the evidence for a more isolated Portuguese society was not as clear, for the Portuguese have, on the whole, lower, and in the case of Melgaço, Prado and Remoães, much lower, endogamy rates. Furthermore, the attraction into the area of long-distance migrants to Melgaço has increased the mean and median BP distances for migrants into all parishes, suggesting a wider spatial distribution of genes. The number of migrant couples into the Portuguese parishes is also higher than in the Galician parishes, this would have had the effect of introducing double the amount of genetic material into each population, increasing the rate of isolation breakdown.

The results obtained in Chapters 4 and 5 for the Portuguese populations are clearly not consistent with each other, and the differences between Galician and Portuguese communities outlined in Chapter 4 are not as obvious once marital mobility patterns are taken into account. Why then should the Portuguese appear as more isolated than their Galician neighbours?

In my opinion, the answer lies in a difference in the way in which parish borders demarcate a breeding population in Galicia and Portugal. One of the problems of population genetics has been to define the breeding population, a community of inter-breeding, sexually reproducing individuals who share a common gene pool. It has been suggested by Boyce and colleagues (1971) that the breeding population refers to a geographic group of people grouped in a village or hamlet who form separate Mendelian populations. Cavalli-Sforza and Bodmer (1971) suggested the term should be broadened to refer to an aggregate of all those groups (villages and hamlets) from which a mate could be chosen by a given individual. In practice it is difficult to know exactly what the breeding population is, for its limits are not precise and the individuals which form it move within an area which exceeds the limits imposed.

This study has confirmed the difficulties in establishing which population unit acts as the breeding group (or gene pool), and in my opinion it is this flexibility in the definition of a breeding group that makes the Portuguese and the Galician populations appear as more different than they really are.

The Galician parish is a very clearly defined population unit, with its own geographic limits and socio-cultural prescriptions (see Chapters 2 and 3). The peculiarities of each parish result in very high parish endogamy rates, which are maintained by strict rules regarding marriage outside the parish boundaries e.g. boycotting a marriage between a local female and a "foreign" male (Chapter 4). In the case of the Galician parishes under study, these restrictions on parish exogamy were

perpetuated through the system of land ownership. Parishioners did not own the land they cultivated, which forced permanent settlement in the parish in order to avoid losing tenancy rights.

The parish in Galician populations would have been, because of the relationship between people and their land, the closest equivalent to a breeding population. Exchange with neighbouring parishes would have been significant genetically, because each parish constitutes a breeding population in itself, which would have guaranteed a certain degree of genetic uniqueness. In other words, the proportion of parish exogamy would have been quantitatively small but qualitatively important.

Patterns of land ownership in Portugal were slightly different (Chapter 3). There was a small proportion of land owning peasants, there was some land which belonged to the nobility and there was some land which belonged to the church. These plots of land were small and scattered around, not conforming to parish boundaries, and they were worked by *jornaleros* who work on a daily basis. Although the majority of the population were working the land of others just as in the Galician case, the way this land was worked was different. Agricultural work was paid on a daily basis, not through a tenancy agreement, and labourers worked where they were needed, i.e. the working population was much more mobile. This increased mobility reduced the strictness of the parish boundary. In doing so it increased the range from which individuals could choose their marital partners and helped in the redefinition of the breeding population. In the Portuguese case, the breeding population encompassed a much broader geographic and social terrain to that of the Galician parish.

The need to use the same population unit to make data comparable resulted in the choice of the parish as the breeding population, mainly because of the Galician parish. Endogamy and exogamy were then related to this level of population. It comes as no surprise then that the Portuguese should have lower parish endogamy and higher spatial exogamy.

The distribution of the Portuguese within different parishes was also genetically significant, but for another reason. Through time, peasant mobility would have helped homogenize the region, so that, contrary to the Galician example, parish exogamy would have been quantitatively larger but qualitatively less important i.e. there would have been less genetic exchange.

The differences in land ownership and patterns of agricultural work have therefore influenced the extent to which genetic exchange is qualitatively important and the apparently higher degree of isolation of the Portuguese parishes is a function of these differences.

The study of the extent and orientation of movement and of the distances travelled

within the populations under study revealed that despite the recognition of two different concepts of a breeding population for Galician and Portuguese communities the two types of population have boundaries within which movement is very similar. In other words, the processes which create the boundaries are comparable.

One of the parameters which was used to define the extent of movement was the admixture rate proposed by Sheets (1980). The admixture rate is indicative of the isolation of a population because it considers the proportion of exogamy in relation to population size. The lower the index the more isolated a population will be. The results for admixture rates revealed very isolated populations regardless of the side of the river to which they belonged. Melgaço was the odd one out once again; the rest of the parishes were arranged according to population size, so that smaller parishes had higher admixture rates. The parishes of Remoães and Cequeliños, the smallest parishes in the area, had higher admixture rates, over 0.1. All the other parishes had values under 0.1. Dyke (1984) suggested that there was a minimum population size of 300, under which a population needs to engage in exogamy in order to find mates, for their size is too small to allow for self-sufficiency. Both Remoães and Cequeliños have population sizes around that estimate (318 and 420 inhabitants respectively) which could account for their slightly higher admixture rates, considering the importance of population size for the calculation of the index. Cequeliños is slightly bigger and thus has a slightly lower admixture rate (0.133 instead of 0.170). Melgaço's position as the 'urban' parish is confirmed, for it has a much higher proportion of exogamy and a higher admixture rate in comparison to its neighbours at either side of the river, albeit its comparable population size. The low admixture rates obtained fit in well with the high inbreeding values characteristic of populations at either side of the river. It is worth pointing out that even the values for Melgaço are low in comparison to values obtained from other studies which would suggest that even the town is slightly isolated. The high exogamy encountered would thus represent the high proportion of marriages in which both partners are exogamous, but because the admixture rate obtained is still low, it would appear that this category is engaged in post-marital movement and do not settle in Melgaço even though they marry there.

These similarities in admixture values and inbreeding are the result of a high localization of marriages and a limited spatial continuity of gene flow. Marital distances involved indicated there was intense interbreeding confined to neighbouring areas, so that the model which would best fit the populations in the study is the Neighbourhood Knowledge model (Boyce et al., 1967) i.e. mate choice which involves an exogamous partner is very much dictated by the day to day contacts of each population (parish) with its immediate neighbours.

Differences in the data arise from the different ways in which the Galicians and the Portuguese have moved around from their birthplace. Thus, although average distances travelled for marriage were short in both Galicia and Portugal, the means were greater for the Portuguese. This is not unexpected, if we consider the differences outlined above regarding the two "types" of breeding population and the way patterns of land ownership and agricultural land lease have resulted in different mobility patterns for the Galicians and the Portuguese. The higher Portuguese averages could have been "inflated" by the presence of long distance migrants in the area attracted to Melgaço. In order to take account of this fact median values were calculated. Median values for Galicia showed the importance of parish endogamy (0.0 km). Median values for the Portuguese parishes of Alvaredo and Paderne were also 0.0 km (parish endogamy) but values for Melgaço, Prado and Remoães were slightly higher reflecting the slightly higher mobility of the average peasant within the *concelho* of Melgaço, even if distances involved are always short on the line of distances between neighbouring parishes. Normally, medians in Portugal reflect the distances between a parish and the immediate neighbour which provides most of the exogamous mates (a situation which is also applicable to mean distances in Galicia). This suggests that the mobility of the Portuguese peasant was very much restricted by distance, and that agricultural work was done either in their parish or in the parishes which were immediate neighbours.

Exchange with neighbours was probably facilitated by the *caminhos* and the *carreiros* and a self perpetuating system can be discerned i.e. these two axes of movement facilitated exchange with neighbours which encouraged the use of these two types of "roads" which then facilitated exchange with neighbours and so on. This type of exchange is very important socially, because of the range of social contact it creates between populations, necessary in an area where social contact would have facilitated the supply of agricultural work (especially in Portugal). It is also important genetically, because it increases the rate of exchange between neighbouring populations, promoting genetic homogeneity in the region and maintaining local diversity. Neighbourhood knowledge helps in this way increase the range from which mates can be obtained, extending the definition of the breeding population to encompass a wider gene pool, geographical space and social reality than that of a Galician parish. This situation describes the situation in Portuguese parishes at the time. Neighbourhood exchange in Portugal was a more significant part of everyday life than in Galicia.

That short distances were involved in the choice of an exogamous mate for both sides of the river has further support in the small differences between the distances separating the birthplaces and the residences at the time of marriage. Differences are very slight, if present at all (except Melgaço), which suggests very little, if any, pre-marital

movement of spouses. Movement undertaken for marriage was all the movement undertaken before marriage. The fact that the selection of an exogamous mate was so localised and involved such short distances meant that no movement was necessary prior to marriage i.e. to take up residence in the area. Again, the slightly "inflated" averages for the Portuguese side could reflect the presence in the area of long range migrants who were attracted to Melgaço. However, the choice of a long distance migrant is the exception rather than the rule, a conclusion further supported by the short distances involved in the selection of a local mate.

The short distances involved in mate choice, and the importance of parish endogamy and exchange with immediate neighbours could point to socio-cultural practices, in particular the practice of natolocal residence in the area. A system of natolocal residence is only likely to persist between households which are a short distance away and easily accessible. We know that easy access existed between households which were close together because of the existence of *caminhos*.

Patrilocal communities were revealed in the isonymy analysis, which did not confirm or refute natolocal residence patterns. What the isonymy analysis did verify is the exclusivity of one residence pattern (patrilocality) over another (matrilocality): but natolocal residence can exist parallel to either patrilocal or matrilocal residence patterns. The pattern which emerges for the communities studied is thus one in which parish endogamy and local selection of mates predominated, suggesting the possibility that natolocality and patrilocality could have existed parallel to one another. Endogamous marriages would be characterised by a natolocal residence pattern, whilst exogamous marriages, especially those involving a mate from parishes other than neighbouring parishes, would be characterised by patrilocal residence patterns.

The predominance of patrilocal residence rules would have contributed to the isolation of the communities in the study. In all of the communities studied there was a greater proportion of male exogamy (i.e. the male was the exogamous mate) when compared to female exogamy. High proportions of male exogamy do not necessarily contribute to the breakdown of the genetic isolation of an area in which patrilocal rules predominate. The exogamous male is important for the linking of two spatially (geographically and genetically) separated areas, but his contribution to the genetic structure of the parish in which he marries will not be important unless he stays there. However, if patrilocal rules predominate, it is likely that an exogamous male would marry in his bride's parish but would not necessarily take post-marital residence there. Instead, he would take his bride to his own parish. In other words, the parish to "benefit" genetically from the exchange is the parish the male come from, and it is females who will act as the agents of gene flow. From this point of view, it is not surprising that the

parishes in this study remained quite isolated genetically, for most of the movement for marriage is undertaken by males and not females. Only those parishes in which female exogamy (i.e. the female is the exogamous mate) is higher will experience a breakdown in genetic isolation. In the case of Melgaço, the apparently decreased isolation could be due to the combination of high male exogamy (as in the other parishes) with a system of matrilocal residence. The patrilocal residence rules revealed in the analysis of isonymy are consistent therefore with the high inbreeding levels and the low admixture rates found.

Although socio-cultural elements also played an important part in the exchange of migrants between populations, the patterns of marital exchange on either sides of the River Minho are also strongly determined by geographic proximity, and space and distance are important elements for admixture. The analysis of orientation of marital movement confirmed the importance of geographic elements in restricting gene flow. Orientation of marital movement in Galician and Portuguese communities is very much determined by topographical features. This is not surprising, considering the presence of the River Minho and the associated mountain valley. These two geographical features have combined to produce only one plane along which movement can take place: along the river in an east-west axis. Only the parishes of Mourentán and Paderne are in a geographical position to engage in movement along a north-south axis. The former lies on another river valley, that of the Deva, a tributary to the Minho, which was taken advantage of to construct a road from Arbo to La Cañiza and from there to Tuy and Orense and the rest of Galicia. In other words all movement from the rest of Galicia into Arbo and Barcela would have had to go through Mourentán. In Portugal, all movement from the upper valley populations into the east-west road to Galicia and the rest of Portugal would have had to go through Paderne, for it is through the parish that a road links the upper valley with Melgaço. The unique position of these two parishes confirms the importance of an advantageous geographic position in the possibilities to choose mates from a wider range of locations, for such a position encourages a wider spatial gene distribution. That these two parishes should still be isolated genetically and have low admixture rates could be due to these parishes being "providers" of mates rather than "receivers". In other words, they provide the mates to neighbouring parishioners (Morton et al. 1976) who would then settle in their own or in another parish, and not in either Paderne or Mourentán.

The presence of the river and the importance of the east-west axis is evident on both sides of the river. Movement in Galicia follows this axis taking a west to east orientation for the parishes in the east of the Deva and an east to west orientation for the parishes west of the Deva (Cequelíños). In other words, the River Deva is also acting as a barrier to gene flow. This has resulted in an increased isolation for the parishes east of

the Deva: Arbo and Barcela, because movement into the parishes can come from the west or from the north (through Mourentán) but not from the east. Movement into Cequeliños from the rest of Galicia is possible from the province of Orense, and migrants would have been able to cross the Minho at Frieira. This parish is the one which is most open to the outside and the most likely recipient of new genes into the area, which explains the lower inbreeding levels found for these parishes.

Movement in Portugal also follows an east-west axis and data can be divided into two blocks: those parishes next to Melgaço and those parishes situated further away from it. For the parishes around Melgaço, and this includes the town itself, Prado and Remoães, movement follows an east to west line, probably because both Prado and Remoães are west of the town. The east to west movement would reflect the inflow of migrants from Melgaço, and this would include parishioners, migrants from the eastern part of the *concelho*, Galicians from the province of Orense and other long-distance migrants. Because the parishes are to the east of Melgaço the east to west movement would represent the movement along the river toward Monção and from there to the south (the *ratinhos*) and to Viana do Castelo. The east to west line is the line for emigration and exportation. The parishes of Alvaredo and Paderne have an important west to east line, reflecting in part the pull of Melgaço but also the pull of Paderne itself, a big agricultural parish where there would have been plenty of seasonal work.

Movement across the river was possible but not frequent except for the parishes around the crossing point (Alvaredo, Paderne and Remoães). Chapter 5 revealed how the presence of the crossing point between Paderne and Arbo would have facilitated immensely the exchange between populations at either side. In fact, exchange between populations across the river decreased as movement east of the crossing point took place, which added weight to the suggestion that the River Minho behaved more as a geographic barrier than as a political one. If the river had been as easy to cross elsewhere as it was between Paderne and Arbo, we might well have found that the exchange between Galician and Portuguese populations increased.

Further evidence was provided regarding the movement into Portugal of Galicians from Orense and Lugo, who would have crossed the political border in Orense and not the Minho. For all parishes except Alvaredo, the number of Galician migrants from Orense was larger than that from across the river (Figure 5.9). This is significant if we consider the proximity of Alvaredo to the crossing point between Arbo and Paderne and its distance away from the political border in Orense. Perhaps its separation from Melgaço is also important, for the town seems to have behaved as a "filter" of migrants, suggesting these were attracted to Melgaço in the first place.

There is one further issue raised in this study regarding asymmetry of movement

across the political barrier. Why is there is more movement from Galicia into Portugal than the other way round and why should most of this movement be done by males? The answer to this question is complex, and involves the consideration of three important facts: history, different patterns of movement for the Galicians and the Portuguese and land ownership differences.

Twenty years before the beginning of the time period studied, Portugal was invaded by the Spanish. During the period studied, the Spanish signed the Treaty of Fontainebleau (1797) with the French, which guaranteed the division of Portugal into two identical parts for France and Spain. The presence of Galicians in the area has been, throughout history, an assurance that there were Spanish inhabitants in Portugal, which would make it easier for the territories to surrender. Chapter 3 reviewed the settling of the area after the independence of Portugal; Galicians made up a considerable proportion of settlers. The settling of the area continued into the nineteenth century.

The asymmetrical movement between Galicia and Portugal illustrates best, in my opinion, the different migratory movements in which the Galicians and the Portuguese have been engaged, in particular the movement of *galegos* into Portugal. The seasonal movements of the *galegos*, done by foot and aided by local *caminhos* would, in the light of this data, take place to those Portuguese places immediately opposite the river. It must also be borne in mind that the movement was done every year and to the same place. Movement did not involve long periods of time, which means the Galicians could not possibly have travelled great distances. Furthermore the choice of Portuguese partners is very much a local choice, from the populations of the province of Minho and mostly from the *concelho* of Melgaço. Moving into Portugal could also facilitate the emigration to Brazil and the temporary migration into the main cities (primarily Porto and Lisbon). The Portuguese seasonal movement to the southern parts of the country (*ratinhos*) to help in the large estates takes the place of movement into Spain and Galicia. Alternatively, and at the time of the study, the Portuguese would have started to move out to Brazil, on a more or less permanent basis, again instead of moving into Spain and Galicia.

The movement to Brazil would explain the asymmetry of movement almost perfectly, for it would have deprived the populations on the Portuguese side of the river from a supply of males and resulted in unequal sex ratios. The deficiency of males would have led the females to seek partners along and across the river, which explains the movement of Galician males into Portuguese parishes immediately across the river and of Portuguese females into Galicia.

To argue in favour of land ownership as a factor encouraging asymmetrical movement across the Hispanic-Portuguese border is in my view, and after the data presented in this study, deceptive. Some of the movement across the border could have

been undertaken by Galician males, probably ambitious minor heirs, looking for possibilities to buy land. However, the possibilities to acquire land in the Portuguese side alone cannot, if we look more closely at the facts, explain the asymmetry of movement adequately.

Buying land in Portugal for a Galician was not all that desirable. Amongst other things, the tenancy leases of land in the Galician side would have ensured an income, even if the land did not belong to one. Moving to Portugal would have meant leaving that security behind, only to find it hard to buy land there. There was no assurance that moving into Portugal would allow for buying land. Land made available for purchase in Portugal was expensive, and a sufficient amount of income was needed to buy land. The Portuguese peasant had to go abroad in order to obtain the supplementary income: it seems probable that the Galician peasant also had to emigrate in order to obtain the money to buy the land. The security of cultivation in the Galician side would have, in my opinion, helped the movement of Portuguese into Galicia rather than the other way round. Also, the nineteenth century witnessed the introduction of the Mendizabal decrees in 1836 which would have helped the Galicians buy land in their own side of the river anyway. Evidence from other studies relating to Spain (Calderón, 1989) and Galicia (Fúster, 1983) showed how the possibilities of buying land from the church were taken up by the rural populations.

In this preliminary study of the genetic structure of Hispanic-Portuguese populations, communities along the River Minho have been seen to form part of a region in which the specific geographic constraints resulting from the presence of the river, its tributaries, the mountain range and the lack of suitable roads with the exception of those linking neighbouring parishes (*caminhos*) have created very isolated, patrilocal communities with high inbreeding and local exchange. These features have arisen from both geographic and socio-cultural and economic constraints but the exchange between communities has been constant and extensive, especially across the political border in Ourense. The population exchange between Galician and Portuguese populations confirm the important role of geographic barriers in genetic microdifferentiation through a reduction of population movement and gene flow.

Through this discovery, this study has contributed a little to the literature in favour of comparing the processes which operate in Hispanic-Portuguese populations. Most of the work has been from a demographic perspective. This study has provided some biological evidence that the genetic structures of both Galician and Northern Portuguese populations are similar enough to possibly consider the two areas as a region. The results obtained here suggest an avenue for comparative research into the genetic structure of

Hispanic-Portuguese populations is needed to provide a suitable anthropological answer to the following question:

"are the border areas in our country [Portugal] approaching in behaviour their parallel zones in neighbouring Spain or is the western area of the Iberian Peninsula behaving like a region?"

(Amorim, 1987:111).

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