

CAPÍTULO 10

SUMMARY

The main objective of this work is to review some of the current interpretations about the first agriculture of the Basque Country and to offer new data about the use of plant resources and human impact in the past. The method used is the analysis of plant macroremains recovered from sixteen archaeological sites dated from the late Mesolithic to Roman times.

The Basque Country is located between two biogeographical regions: the Eurosiberian to the north and the Mediterranean to the south. This situation determines the distribution of the vegetation, which is very varied and shows transitional conditions. The territory is formed by a combination of sierras and corridors between the sedimentary valleys of the Ebro and Aquitania and it includes the Western Pyrenees and the eastern part of the Cantabrian Mountains with several parallel ranges of mountains oriented E-W. The mountain barriers distributed from the coast to inland selectively determine the distribution of the vegetation, which in the south tends to the Mediterranean optimum and in the north to the Eurosiberian or Atlantic. The most northern E-W mountain ranges form the Atlantic-Mediterranean watershed. Most of the sites we include in this work (Pico Ramos, Kobaederra, Lumentxa, Cotobasero 2, La Cabaña 4, Hirumugarrieta 1 and 2, Ilso Betaio, Arenaza, Calle Santiago Irún) are located to the north of this watershed, by the coast or in Atlantic valleys and mountains. This area has a mild and very wet climate, without summer drought. The landscape shows a combination of hills, mountains and valleys with very acid soils. Different forests form the potential vegetation. Those of *Quercus robur* would be the most extensive ones while *Fagus sylvatica* occupies the montane areas. Under particular conditions, other communities are also common: forests of evergreen *Quercus*, *Quercus pyrenaica*, *Betula*, *Alnus* and also the typical communities of the coastline and marshes. The other sites that are included in this work are located in: (1) the mountains of the watershed, on the limit between the Navarro-Alavés Subsector and the Western Pyre-

nean Subsector (Aizpea), (2) the submediterranean mountains and valleys on the Navarro-Alavés Subsector (Kanpanoste Goikoa and Ordunte), and (3) Urbionense Subsector on the Sierra Ibérica (Collado del Mallo). These areas show transitional features. Different *Quercus* forests and *Fagus* are potentially the most common dominant communities with progressive more Mediterranean character to the south.

Agriculture is understood here as the cultivation of domestic species, different from previous practices of wild plant use. Diffusion is the main process involved in the origin of crops in Western Europe. Even if we want to emphasise the role of local hunter-gatherers in the adoption of farming, the origin of agricultural practices is an imported matter that can be associated with demic diffusion, the adoption of crops by hunter-gatherers or with both. Wild plant food gathering is the second subject we will consider. Almost all the work dedicated to holocene hunter-gatherers studies accept that wild plant foods were an important component of human diet. However, the archaeological evidence is still very scarce, both from Mesolithic and from farming societies. Thirdly, human impact on the forest has been understood here as a degradation process resulting from different factors among which the human one is the basic one. During the Holocene, it results in clearances and in substitutions of some plant communities by others.

There is a wide range of archaeological evidences that can give us information on the exploitation of plant resources during the past (ceramics, artifacts, grinding stones...). However, the function of these objects can be very diverse and the studies directed to determine it are not widespread among us yet. Other indicators of economic change such as faunal studies or the patterns of occupation of the territory are not enough on their own to define subsistence systems or the importance of gathering or agriculture. Chemical analyses of human bones are a very promising type of evidence but are also scarce in the Basque Country in part due to the lack of skeletal

material. Among the archaeobotanical research, palynology is the discipline that has a longer tradition but it is not valid on its own to define human strategies of plant use in the past. In order to offer new direct data that help review some of these questions, in this work we have used the archaeobotanical analysis of macro-remains – basically seeds, fruits and charcoal – but we think that the final interpretation has always to be interdisciplinary, taking into account other types of evidence.

Although the presence or absence of crops is central in the definition of some of the periods we study here, such as the Mesolithic and the Neolithic, agriculture is a subject that has received very little attention, basically because of the absence of archaeobotanical remains. In fact, we can see that chronological or technological criteria are the most widely used in the literature to define these periods. Many of the interpretations dealing with subsistence strategies and with prehistoric agriculture in the Basque Country have agreed in different questions:

(1) Epipalaeolithic ways of life, with traditional subsistence systems, continue at least until the end of the Neolithic, c 5300 BP. At this time megalithic structures start being built and open-air occupations spread.

(2) The adoption of agriculture in the Basque Country is a late one. According to the different authors, it could happen between the end of the Neolithic until the Roman period.

(3) Pastoralism preceded agriculture. In any case, pastoralism is always taken for sure but the presence of agriculture is uncertain.

(4) There is a gap in the adoption of agriculture between the southern part of the Basque Country and the Atlantic part. The Atlantic Façade would adopt it later.

(5) After the Neolithic, even though the botanical remains are as scarce as for previous periods, the authors accept an increasing importance of agricultural practices. However, the authors that work in later periods (Iron Age, Roman) still consider that agriculture in the Atlantic area is not an important activity.

(6) For all the periods, the trend is to consider wild plant foods as a small complement of other major subsistence strategies, basically hunting or, in later periods, agriculture and pastoralism.

In our opinion, these questions are favoured by the lack of archaeobotanical evidence but also by a number of methodological, geographical and historical assumptions that should be questioned. For example, it is common to assume that:

(1) Plant remains do not preserve, even if their recovery has not been tried.

(2) Archaeological pollen analysis is a good indicator of agricultural practices. If cereal pollen is not

present on a site it is assumed that agriculture was not practised.

(3) Agriculture did not exist because sickle elements are extremely scarce in the sites, although there may be other techniques to harvest the cereal.

(4) Hunting or pastoralism are the main economic activities, although no archaeobotanical analyses are available.

(5) Climate and soils of the Atlantic Basque Country are not suitable for cereal agriculture although ethnographical and historical evidence show the contrary.

(6) Atlantic Basque country and Atlantic Iberia have been isolated areas which have suffered a delay in comparison with adjacent areas, not only in the adoption of the domesticates but also in historical change in general.

(7) The Ebro Valley is seen as the only possible way for the neolithisation of the area.

The objective of this work has been to approach these questions offering some new archaeobotanical data that help review them. The most usual type of preservation of plant macro-remains in Basque sites is carbonisation but we also include one waterlogged site with anaerobic preservation. The materials that form our samples are wood charcoal, seeds and fruits, cereal chaff, parenchyma tissues and morphologically indeterminate material.

The waterlogged site was processed by water sieving. In the others flotation or dry sieving was carried out, the latter only for wood charcoal retrieval. Flotation has allowed to recover different types of material and to process big amounts of sediment in a quick and efficient way. Whenever possible, we have recovered and identified both seeds/fruits and wood charcoal. The data was collected using a multisteped sampling, in successive phases organised in a way that they entitle the validity and reliability of the final conclusions: selection of the sites, selection of the contexts or stratigraphic units to sample and random sampling – in most cases – of the units when it was not possible or necessary to process all the sediment. The evidences of crops recovered in the sites are generally scarce and in most cases they are caryopsis of wheat, barley and millet. Most of the wild plant foods are hazelnuts and different fruits of the *Rosaceae Pomoidae*, a group that includes trees such as the apple tree or serbal. Other possible wild plant foods are acorns, sloe and strawberry tree.

The identification of wood charcoal has provided us with two main types of information: (a) ethnobotanical, about the human use and selection of fuelwoods, and (b) ecological, since it shows at least some of the arboreal and woody species that grew around the sites. The interpretation of wood charcoal poses taphonomic problems, which are poorly known

and difficult to estimate, that can determine the representation of the taxa: physical properties of the fuel-woods, availability, other uses of the wood –for nuts, crafts, building material, etc.–. The advantages of the charcoal analysis is that the remains are datable, they are the subproduct of human activity and also tend to represent some of the woods close to the site. On the contrary, pollen may have a regional component difficult to assess. Thus, for an ecological interpretation we have combined both types of evidence. Pollen and charcoal have provided different results: the mode of arrival of the material, the conditions of sedimentation, the preservation, the sampling and the analyses are different. However, they are complementary and allow to evaluate the importance of anthropic and natural factors in the composition of the samples.

The main conclusions of this work are:

Method

1. Plant remains can be recovered at archaeological sites, even in acid conditions, or in hunter-gatherer sites as long as the adequate sampling strategies are used. In none of the sites where we found cereal had it been detected prior to our analysis. Pollen analysis had also failed to identify it. In hunter-gatherer sites or in sites with Mesolithic-Neolithic transition, an effort should be made in order to process all the sediment which is excavated or at least an important part of it. This is because (1) they are periods about which very little is known about the use of wild plants; (2) it is extremely important to certify the existence or absence of agriculture, and (3) the frequency of the remains tends to be very low. With flotation, if both the flot and the residue are examined, the results improve considerably.

2. Some dolmens should be extensively sampled with flotation in order to determine their archaeobotanical potential. The excavation of the habitation areas next to and below the tombs, when they exist, might afford greater information on subsistence systems.

3. At the current stage of the research in the area –our data about prehistoric agriculture and plant foods in human diets is still extremely limited– it is necessary that the sampling of plant macro-remains be systematically integrated in the archaeological excavations from the beginning of the field work. Only in this way can the low frequencies and the context-related variation be taken into consideration.

4. Nowadays, in most excavations in the Basque Country, the sediment is dry or water sieved so we think that flotation machines can be easily incorporated into field work. However, if it is not possible, other methods like manual flotation or water sieving are also valid as long as the adequate mesh is used (0.25 mm).

5. Charcoal can be recovered using dry-sieving, and a mesh smaller than 4 mm should be used. This system is not valid for recovering botanical material other than wood.

The last hunter-gatherers and first farmers of the Basque Country (7800-4500 BP)

1. Available archaeobotanical data shows that agriculture was adopted in the Basque Country at least from 6000-5300 BP. On the coast cereal pollen has been identified in Herriko Barra (Zarautz, Gipuzkoa) c 6000-5800 BP. In the cave of Kobaederra (Kortezubi, Biscay) cereal has been AMS radiocarbon dated at 5375±90 BP (4360-3990 cal. BC), in Pico Ramos (Muskiz, Bizkaia) at 5370±40 BP (4320-4050 cal. BC) and in the cave of Lumentxa (Lekeitio, Biscay) barley has been recovered in a context dated at 5180±70 (4220-3800 cal. BC) and 5095±75 BP (4040-3710 cal. BC). Because of lack of sampling, at present we do not have data for the southern area of the territory. The archaeozoological remains recovered in Peña Larga (Cripán, Álava) and Arenaza (Galdames, Biscay) show that domestic animals were already available from at least c. 6000 BP and at this moment the dates for the coast and the inland do not differ greatly.

2. Apart from the Ebro valley, usually considered the only possible way for domesticates to arrive in northern Iberia, we cannot ignore the importance that the south of France and the central-eastern Pyrenees could have had in the Neolithisation of the Western Pyrenees and the Atlantic Façade. There is artefactual evidence showing the existence of trans-Pyrenean relationships and recent data reject the idea of a late adoption of the Neolithic of western and south-western France. Rather than through a linear and regular movement up the Ebro valley from the Mediterranean coast, the diffusion of the crops in northern Iberia is better explained by more complex models. Domesticates could come from different foci although, in the case of plants, the information we have is still extremely scarce. It is also possible that there were no major chronological gaps in the adoption of domesticates in the different areas of the Basque Country. In fact, we are dealing with a small territory –Western Pyrenees, upper Ebro valley and easter Atlantic Façade– which must have received multiple influences and does not have major geographical divisions. However, the different cultural settings –if there were such– and the different ecological situations could have determined the way in which agriculture and pastoralism became integrated in the subsistence systems.

3. The data from Kobaederra and Arenaza confirm that domesticates existed on the Basque coast from the first half of the VIth millennium BP. Howe-

ver, we do not know if this was the general situation or if there still existed exclusively hunter-gatherer groups. Sites like Pico Ramos in Biscay and Herriko Barra in Gipuzkoa could be hunter-gatherer sites or occasional camps of groups which were already Neolithic.

4. The neolithic evidence of agriculture is still extremely small in the Basque Country. For this reason we cannot value the importance of the different crops that were involved and we can only say what taxa have been identified so far during the VIth millennium BP: barley and emmer wheat in Kobaederra and hulled barley in Lumentxa. One objective for future research should be to gain more specific and concrete information on this subject and determine whether the agriculture of the Atlantic fringe of the Iberian Peninsula is in anyway different because of its humid climatic conditions. For example it would be interesting to assess whether hulled wheats and barleys which thrive in humid and mountain conditions were more widely used.

5. There is different evidence –the presence of hulled cereals, humid and mountain conditions, low intensity of agricultural practices, absence of sickle lithic artefacts– that lead us to think that during the Neolithic in the Basque Country other methods rather than the use of sickles were used in the harvest of cereals: plucking the ears off by hand or using reaping sticks like the Asturian *mesorias*. The absence of sickles would mean that the straw was not cut, maybe because it was not necessary for animal food, building material or craftworks. Domestic animals could eat the straw on the fields –although the one from hulled wheats is not greatly appreciated– or use other types of pastures or tree leaf foddering.

6. From the available data, it seems likely that agriculture was not very important in subsistence systems from the VIth millennium BP: the remains of crops are very scarce, there is evidence of deforestation but its intensity is variable and in the Neolithic of Kobaederra the presence of other resources –basically molluscs and fauna– seems to be more important. However, we cannot forget that the data is still very limited and that all of it comes from caves.

7. From c 5300-5000 BP onwards, many dolmens were built in the region. They show the occupation not only of the coast, but also of the territories 600 m above sea level. The exploitation of these areas, where agriculture can be developed, could be the consequence of different factors: (a) increasing demographic pressure as a result of the new economic system and (b) increasing amount of domestic animals which need to be fed and thus requires the exploitation of a bigger territory. In the dolmens we have studied, no direct evidence of subsistence systems has been

found. This is due to different taphonomic factors and to limited archaeobotanical sampling.

8. The introduction of agriculture did not mean that wild plant gathering was abandoned. In contexts earlier than 5000 BP we have identified wild plant foods: nuts (hazelnut and acorns), pomes and fragments of parenchymatous tissues. The archaeological visibility of these remains is related to the physical properties of the tissues they are formed with and also to the practices related to their consumption, processing and discarding. Hazelnut pericarp is the most abundant plant macro-remain in Holocene sites from northern Spain, most probably because *Corylus* was very frequent during this period, but also because the pericarps got frequently in contact with fire and may have had a differential preservation. Acorns are less frequent but they could have been an important resource because oaks were the most important component of forest communities during this period and the ethnographic evidence shows that they have been widely used in human subsistence. We have identified *Rosaceae* fruits type *Malus* or *Sorbus* in Aizpea, Kanpanoste Goikoa and Lumentxa. The pomes could have got charred during the roasting or drying in order to improve their taste or conservation.

9. Even in the sites where wild plant foods are well preserved, as in Aizpea, we cannot forget that, when the only type of conservation is carbonisation, there must have been many other plant foods that were used but have not been preserved. The number of plants used for food, medicine, rituals, etc. must have been much higher than what we recover in our samples where only acorns, hazelnuts and *Pomoideae* fruits are present. Basically from the data from Aizpea, we think that during the end of the Mesolithic there could have been an intensive exploitation of wild plant foods: (a) wild vegetal resources were abundant, easy to gather and could be stored, (b) we recover some remains, and (c) the only available chemical analysis on human bones shows that plants were the most important type of food of this individual. However, the data is still very limited to be able to adequately assess their real importance in the human diet.

10. Agriculture was adopted at a time when forests, particularly oak forests, were spreading. The first clear evidence of human impact in the Western Pyrenees can be seen from 6300 BP. On the coast of the Basque Country, during the first half of the VIth millennium BP, palaeobotanical remains show different situations: some sites and off site deposits show closed landscapes while others show clear evidence of openings. The clearances increase in accordance with the building of the megaliths (from 5300-5000 BP).

From the Chalcolithic to Roman times on the Basque coast (4500BP – III AD)

1. It has traditionally been considered that during this period agriculture was in an incipient stage in the Basque Country and that its importance in subsistence systems was very limited. However, the archaeobotanical data we present here, although scarce, show that agriculture had an increasing importance in post-neolithic subsistence systems. In fact we can say that the generalisation and extension of farming took place in this period. This process would be confirmed by this data: (a) the remains of crops are more frequent in archaeological sites and cereal is also detected for the first time by pollen analysis; (b) millets seem to become a part of the agricultural system; (c) the cultivation of different species of cereals that require different processing (hulled/naked) and different periods of sowing (wheats/millets) might indicate an increasing complexity of agricultural systems; (d) during the Iron Age, besides growing different types of cereals and legumes, the Basque Country appears as one of the first peninsular cases of major use of spelt (*Triticum spelta*); (e) deforestation processes become more important.

2. The generalisation of agriculture does not imply the abandonment of the gathering of wild plant foods. In the sites where an archaeobotanical analysis has been carried out, hazelnuts, acorns, blackberry and sloe have been retrieved. Its relative importance does not seem great but in the present state of the research we cannot value the evolution of wild plant use through time. These resources may have been particularly important at different times of the year, in periods of famine or among some parts of the population; they could have also been used –acorns, for example– as animal food.

3. The expansion of agriculture and pastoralism during the Chalcolithic, Bronze Age and Iron Age resulted in an important transformation of the vegetal landscape of the Atlantic Basque Country: (1) intensification of the clearances of the forests; (2) spread of new communities such as beech forests; and (3) the transformation of some of the existing forest communities.

4. The spread of beech forests took place at least from c 4000 BP. It does not seem that *Fagus* was an important component of the forests before that, but it was present in the area from the late Upper Palaeolithic. The natural and basically anthropic openings on the mountain belt during the Neolithic and Chalcolithic could have favoured the extension of these forests wherever the conditions were favourable. The Late Holocene gradual deterioration in climate and the decreasing human pressure on the mountain areas could have favoured the spread of *Fagus*.

5. The charcoal analyses we present show that deciduous oaks were, at least from the Neolithic to the Bronze Age, the dominant species in those areas where now evergreen forests are extensive. Thus, we do not think that they are relict forests, a consequence of past warm climatic conditions, as is commonly assumed. Human action would appear to be mainly responsible for the spread of *Quercus ilex* forests on the coast of Biscay.

6. In Roman times (I-III AD) new plant foods that come from the cultivation of fruit trees became available on the Basque coast. In Irún we have retrieved an important number of fruits: grape vine, plum, sour cherry, peach, fig, walnut and olive. Some, like the olive, are necessarily imported and are thus the result of commercial activities, but others could respond to the local cultivation of fruit trees introduced during this period. Because of the lack of adequate sampling, we do not have any data about cereal agriculture for this period.