

FOREST HARVESTING IN THE MOUNTAINS OF THE CORREDOR AND MONTNEGRE MID-NINETEENTH CENTURY

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I. INTRODUCTION

The forests of the Corredor and Montnegre massifs, intensely exploited since the Middle Ages, were subjected to severe pressure in the eighteen hundreds. Among the causes for this intensification in the exploitation of forest resources were the increasing demand for timber for ship building, fuel consumption in glass kilns and other industrial activities, and the extension of the railway network in the north of the Maresme county, which revaluated forest resources in the zone by facilitating their extraction.

Recent studies have identified the profound transformations in the landscape occurring in the Montnegre-Corredor zone in the 19th century. However, a large part of academic effort has been centred on long-term landscape evolution, relegating to a secondary plane the characterisation of the exploitations themselves and the specification of their economic importance. Our work places the emphasis on forest use, precisely in a crucial period for forest development: the middle years of the eighteen hundreds. The main sources for this work are the territorial tax statistics (*amillaramientos*) corresponding to 1852 and 1862, as well as the fiscal documentation connected with them: assessment cards, claim forms for damages due to the exceeding of quotas, and investigation files.

II. THE STUDY AREA

The *sierra* of Montnegre-Corredor forms a small mountain massif (maximum elevation 773 metres) located in the central section of the Catalanian Coastal Range, about 50 kilometres northeast of Barcelona. The study area, covering a surface of approximately 400 square kilometres, is bounded to the north and west by the course of the Tordera River. In the central part of the range, the relief is sinuous and rugged, with very few flat areas suitable

for cultivation. The periodic watercourses (*rieras*) and torrents have excavated narrow valleys in the granitic terrain, which open towards the Tordera or flow steeply towards the Mediterranean. Dense forests of pines and cork oaks covered most of this zone, which is nowadays a nature park. Towards the east, the range ends in a narrow coastal zone, with optimum conditions for agricultural activity.

In the mid-19th century, the surface devoted to forestry uses in the Montnegre-Corredor area was over 15,000 hectares: approximately 35% of the total geographical surface. The predominance of woodland in the zone was clearly higher than that of the Maresme county as a whole, and also slightly above that of several inland counties, such as the Vallès Oriental, which held significant expanses of forest. The arrangement and characteristics of the coastal mountain chain play a crucial role in this aspect.

Both the distribution of human settlements, and the spatial organisation, stemmed from the configuration of the relief. The urban network presented a characteristic lineal pattern. From Mataró onwards, aligned along the narrow coastal plain, the seafaring towns lay strung out as far as the mouth of the Tordera River, separated from each other by distances of little more than two kilometres. The economic life of these towns combined fishing and shipping with intense agricultural and manufacturing activity. Vine growing, and fruit and vegetable crops, had a marked commercial orientation. Textile mills and the manufacture of knitwear provided employment for hundreds of workers. Together with this, shipbuilding, the glass industry, barrel-making and the manufacture of cork stoppers bore witness to an incessant manufacturing activity centred on the exploitation of mountain resources.

The fringe of seafaring towns had its parallel in the string of villages primarily devoted to agrarian and forestry activities, aligned along the course of the Tordera River (from Llinars del Vallès to Tordera). Between the pre-littoral depression and the coast, only the *riera* (seasonal watercourse) of Argentona, the *rieras* of Arenys and Vallgorguina, and the *riera* of Vallalta offer narrow corridors with land suitable for cultivation. Slotted into this relatively restricted terrain, and taking advantage of the sunniest slopes for vine cultivation, were the transverse axes constituted by the settlements of Arenys de Munt and Vallgorguina on one side, and Sant Iscle de Vallalta and Sant Cebrià de Vallalta on the other. Outside the valleys and the coastal plain, the rugged relief of the Montnegre and Corredor massifs noticeably reduced the possibilities for agriculture.

That being said, the mountainous relief, which limited the cultivated surface, allowed the forests, on the other hand, to occupy a very large area. The timber forests, the cork oak woods, the charcoal woods, and even areas covered by scrub constituted precisely demarcated parts of the integral exploitation which complemented agrarian and manufacturing activity. According to the surfaces declared in the territorial tax statistics (*amillaramientos*), the timber forests occupied 3,600 hectares, of which about 400 hectares were made up of poplar (*Populus alba*, *P. nigra*) and elm (*Ulmus minor*) plantations, and 128 hectares were of chestnut (*Castanea sativa*). The cork oak (*Quercus suber*) woodlands destined for cork production amounted to over 1,100 hectares. Woodland devoted to firewood and charcoal production covered a much greater surface (10,634 hectares), equivalent to almost 70% of the forest.

III. FOREST USES

Sclerophyllous woodland is the climatic plant community on the sunward-facing slopes of the entire Catalanian littoral range. In its original formation, the arboreal stratum of this evergreen forest is composed primarily of Holm Oak (*Quercus ilex*) and Cork Oak (*Quercus suber*). The undergrowth offers shrub strata with a great variety of species, among which are usually found Tree Heather (*Erica arborea*), Kermes Oak (*Quercus coccifera*), Strawberry Tree (*Arbutus unedo*), *Viburnum tinus*, and Mastic (*Pistacea lentiscus*). The centuries-old exploitation of the woods in the Montnegre-Corredor must have produced a profound transformation of both the forest and the undergrowth. Specifically, the high demand for cork, impelled by the cork-stopper industry from the late 18th century onwards, favoured the extension of cork oak woodlands to the detriment of holm oak in areas with more favourable edaphic and climatic conditions for *Quercus suber*. At the same time, pine plantations (*Pinus pinea* and *P. halepensis*), of greater utility than the holm oak for building timber, colonised a large part of the former holm oak woods.

In the decade between 1852 and 1862, the treed areas did not undergo noticeable variations. The surface devoted to gallery forest and chestnut groves increased slightly, which could indicate both an increase in the plantations as well as greater precision in the territorial tax statistics (*amillaramientos*). The slight surface reduction in timber forests was amply compensated for by the spread of cork oak forest and charcoal woods. The only important modification was produced by the substantial increase in land declared uncultivated: almost 30% in a single decade. The crisis in wine production brought about by the spread of mildew fungus plague in the 1850s decade explains this sudden expansion of uncultivated areas. Between 1852 and 1862, the mildew fungus (*oidium*) destroyed more than 3,500 hectares of vineyards in the Montnegre-Corredor zone, which were henceforth declared as uncultivated land in the tax assessments (*amillaramientos*) carried out from 1858 onwards.

In the mid-19th century, the woods of the Montnegre-Corredor area were exploited under a private property regime. We have not found, in the documentation consulted, any sign of communal property, nor traces of collective rights of use (*servidumbres colectivas*) of the woods. Salvador Llobet's studies of the zone indicate that private property was already fully established by the 18th century.

Due to their extent, and to the importance of their uses, the cork oak forests were of considerable significance in the area's economy. Firewood from the undergrowth and the branches of the cork oaks was used as fuel, and the herbaceous plants and acorns as seasonal pasture. The sheets of bark constituted, logically, the main resource: due to its floatability, raw cork was traditionally used for making fishing gear. By the mid-19th century, its principal use had become the manufacture of cork stoppers. The high price of blocks of cork, coupled with their light weight and proximity to the transformation industries, made cork into a highly profitable and clearly commercial product.

The map of the cork oak forests in the mid-19th century shows a characteristic distribution. The more than 1,100 hectares declared as «cork woodlands» appear almost exclusively in the municipal areas corresponding to the Montnegre mountains, with the municipalities of Vallgorguina and Villalba Sasserra being the exceptions. In five municipalities the cork oak forests occupy over 100 hectares, making up 75% altogether of the area devoted to this use.

These were the municipalities of Tordera (333 hectares), Olzinellas (197 hectares), Fogars de Tordera (167 hectares) and Vallgorguina (109 hectares). The contrast between the absence of cork oak woods in the Corredor massif, and their dense presence in the Montnegre massif is striking, but not implausible. The abundance of *Quercus suber* in the Montnegre mountains is explained by the combination of siliceous soils with a certain humidity. This latter condition is present to a lesser degree in the Corredor mountains.

In the *amillaramientos*, around 3,000 hectares of timber forests are recorded. The tree-covered slopes were spread throughout the municipalities of the Montnegre and Corredor massif, but showed greater development in the latter massif. Outstanding in the Corredor mountains were the tree-covered expanses of the municipalities of Dosrius (780 hectares), Llinars del Vallès (363 hectares) and Vallgorguina (376 hectares). In the Montnegre mountains, the forests of the municipalities located on the Vallès Oriental side: Montnegre (393 hectares), Fogars de Tordera (335 hectares), and Tordera (323 hectares).

It should be added that the trees did not constitute the only resource harvested from the timber forests, not even the main one in economic terms. In addition to the extraction of trunks destined for construction or sawmills, the forests were used for gathering firewood and producing charcoal. The firewood production of timber forests was estimated at 50 quintals per annum of thick firewood per hectare, and 40 additional loads of «brushwood for ovens». A load of wood was sold at two pesetas. Harvesting costs were high: two *reales* for cutting each load; 1.50 *reales* for hauling work, and three additional *reales* for transport to the market. Altogether, production and transport costs made up about 80% of the final price.

The firewood forests, usually referred to in the *amillaramientos* as «brushwood forests» (*bosques de fagina*), covered over 10,000 hectares. This was, by far, the largest of the harvests, since it represented 44% of the forested area and almost 28% of the total surface assessed for taxation. The forests devoted to firewood production appear in practically all the municipalities of the zone: the only exceptions are the coastal municipalities of Canet de Mar, Malgrat de Mar and Sant Pol de Mar, all three of reduced surface area. The largest expanses of firewood forests were found in Dosrius (1.598 hectares), Llinars del Vallès (1.086 hectares), Montnegre (1.065 hectares), Fogars de Tordera (1.252 hectares) and Tordera (1.106 hectares).

The main call for the timber of the Montnegre-Corredor forests was for building ships. The shipyards on the Llevant coast went through a real golden age in the middle years of the eighteenth century. After a period of deep crisis at the end of the 18th century and start of the 19th, the building of sailing ships in Catalonia underwent spectacular expansion, which was to last until the 1860s decade. Included among the factors responsible for this expansion are the growth of coasting trade, the expansion of colonial trade, and the application of strongly protectionist tariff measures. The economic growth of the eighteenth century, coupled with the tariff barriers, drew strongly on domestic shipbuilding.

The specialised bibliography emphasizes the traditional character of Catalanian naval architecture. The shipyards were directed by shipwrights who were also responsible for designing the vessels. Hull construction took place on the shore itself, with no permanent installations available. Once the hull had been completed and caulked, the vessel was usually towed to the harbour of Barcelona. There, the fitting of the ship's masts, spars, sails and accessories was carried out. The location of the shipyards shows a characteristic spatial

pattern: the harbours of the *Levante* coast, from Barcelona to Palamos. However, the most important naval industry was concentrated in a handful of towns: 55% of the sailing vessels of over 80 registered tons were built, in the 19th century, in the section of coast stretching from Mataró to Blanes. Arenys de Mar and Blanes were, with a notable advantage, the main centres of shipbuilding. The reasons for this locational framework are obvious. The raw material essential to the industry was wood. The ships' frames were built of oak. Once the frames had been completed, the pinewood planking was attached. The need for curved sections of timber meant that, on occasion, holm oak wood had to be employed. For the interior parts of the ship, elm, poplar, ash and walnut was also used. The types of wood mentioned were obtained from the country's own forests. The only notable exception was the wood for the sailing ships' masts, usually made of fir or American pine (*pino melis*), which was necessarily imported.

Glass manufacture, an industrial activity with a high demand for fuel, has also had a long tradition in the Maresme zone. The presence of master glassmakers in Mataró goes back to the early 16th century. Albert García Espuche and Manuel Guàrdia, specialists in the urban history of Mataró, have documented the activity of 28 glass makers in the city between 1571 and 1605: a very important figure for such a specialised manufactured item as glass. According to the interpretation of the said authors, the production and commercialisation of glass was, together with wine specialisation, one of the fundamental bases for urban expansion of the city in the 16th and 17th centuries.

The development of the glass industry in Mataró and its surrounding area has been presented as a characteristic example of the territorial decentralisation produced from Barcelona towards the towns in its area of influence from 1550 to 1640. The glass production carried out in the Maresme by the glassmakers (*vidrieros de horno*), was sold in the capital by the glass dealers (*vidrieros de tienda*). On occasion, according to the interpretation put forward by García Espuche (1998), the Barcelona glass dealers manipulated the glass in their small workshops to add value to the product by means of decorative work. During the 17th century, and also in the 18th, the glass manufactured in Mataró supplied, primarily, the powerful Barcelona market, but the trading network built up in the Maresme eventually spread as far as Castile, France, North Africa and America. Although different sources confirm the existence of glass kilns in the city of Mataró itself, the truth is that the traditional glass industry was an eminently rural vocation. Basic glass production requires the use of inputs of considerable weight: sand and quarry products, and large amounts of firewood and charcoal used as fuel. A glass kiln could consume up to 8,000 quintals of firewood in a six-month period. Given the high cost of overland transport, it would have been logical to carry out the first melt at the nearest point to the source of the cited resources. García Espuche (1998) has indicated that the glass smiths from Mataró used to own or rent kilns in places such as Sant Genís de Vilassar, Vallgorguina and Dosrius. In fact, the success of glass from the Maresme seems to be inseparable from the ample supply of resources offered by the Montnegre and Corredor mountains. Effectively, the abundance of siliceous rocks and the ease with which plant-based fuel could be obtained were essential conditions for the location of the kilns.

The geographical pattern of the glass industry in the study zone must have been, therefore, very similar to the characteristic one of traditional siderurgy, with the kilns for first melt scattered throughout rural areas to minimise transport costs, and the decorating workshops and commercial stores concentrated in cities, above all in port cities. Mataró and Arenys de

Mar fulfilled this latter function. This same geographical pattern continued to be maintained in the 19th century. The persistence of the glass industry in the zone during the first half of the 19th century is amply documented. The *Guía del Ministerio de la Gobernación* corresponding to 1836 indicates that in Arenys de Mar «flat, very crystalline sheets of glass are produced for windows of all dimensions up to a length of one *vara* and a half with the corresponding width». The *Nomenclátor* of 1860 confirms the existence of two factories devoted to glass production in the same town. Similarly, Pascual Madoz mentions in his *Diccionario* (1845) the activity of a glass factory in Mataró devoted to the production of bottles, glasses and flat glass: in total, 30 workers were employed there. The same source notes the existence of a second factory, with 20 workers, in the locality of Alfar, belonging to the municipality of Dosrius. At the Mataró customs, which controlled coastal trade, an annual average exit of 1,707 *arrobos* of common glass (approximately 18 tons) was recorded in the years 1844 and 1845. The General Statistics of Coasting Trade (*Estadística General del Comercio de Cabotaje*), regularly compiled from 1857, does not record shipments of glass from Mataró, but it does from Arenys de Mar: 80 and 97 quintals taken on board in 1858 and 1859, respectively. The figure is very low; little more than three tons on average per annum. It is possible that, by then, the glass industry was confined to the local market due to competition from new producers.

IV. CONCLUSIONS

Despite the retreat of forest masses, very patent in almost all Catalonia from the 18th century onwards, the woods continued to occupy an important place in the landscape of the Corredor and Montnegre mountains in the mid-eighteen hundreds. In the 1850s decade, the area devoted to forestry use amounted to approximately 35% of the geographical surface. Most of the forest surface was occupied by woodlands destined for firewood and charcoal production. There also existed a considerable amount of timber forests (mainly pine and oak woods), and of cork oak woods devoted to cork production. Gallery trees and chestnut groves completed the range of forests.

The forests were subjected to meticulous harvesting. In addition to their exploitation for wood and fuel, also pine cones, holm oak and pine bark, and ashes were gathered, the latter for use in soap manufacture. The proximity of harbours to the forested area facilitated marketing possibilities for these products of low unit value. Forest products supplied the local market and constituted one of the main export materials. From the ports of Arenys de Mar, Malgrat de Mar and Mataró more than 80,000 quintals of wood (mainly oak, pine and holm oak), and 25,000 quintals of charcoal were exported annually. Altogether, these exports amounted to 40% of the marketed goods. Pressure on the forests could have reached its zenith precisely in the mid-19th century. The demand for wood for shipbuilding, which had grown impetuously during the first half of the eighteen hundreds, began to decrease in a marked fashion from 1860 onwards. The descent in shipbuilding coincided with the decline of the kilns used for glass manufacture, a traditional activity in the Montnegre-Corredor forests, which was very intensive in fuel consumption. At the same time, the pressure of land clearing to create vineyards was temporarily halted by the spread of the mildew fungus plague. It is quite possible that the recovery of the forests started with an expansion of cork oak woods, given the high demand for cork bark in the period.