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**'ITS WOOD IS USED TO CONSTRUCT ALFARJES FOR ROYAL PALACES': TORTOSA AS A CENTRE FOR THE PRODUCTION AND DISTRIBUTION OF TIMBER****Jacobo Vidal Franquet**

Universitat de Barcelona

e-mail: jacobovidal@ub.edu

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**Resumen**

En este artículo se intenta ofrecer un panorama general de la producción y distribución de madera para construir que se llevó a cabo desde Tortosa durante época medieval y moderna, y se intenta demostrar que –junto a la ciudad de Valencia– la capital del Bajo Ebro fue un punto clave en la antigua Corona de Aragón

**Palabras clave:** construcción con madera, comercio de madera, bosques, edad media, Corona de Aragón, Tortosa

**Abstract**

This article attempts to provide an overview of the production and distribution of timber conducted from Tortosa during medieval and modern times, and tries to prove that—together with the city of Valencia—the capital of the Lower Ebro was a key point in the old Crown of Aragon.

**Key Words:** timber construction, timber trade, woods, middle ages, Crown of Aragon, Tortosa

Although wood is a construction material seemingly easier to obtain than stone, historical records show that during the medieval and early modern periods beams, joists, braces, planks, and other elements made out of this material were difficult to source, especially for the construction of any building or roof of considerable size. In this paper we wish to highlight the centrality of the city of Tortosa in the production and distribution of wood as a building material—especially, large-sized timber—within the territories of the former Crown of Aragon, especially during the Middle Ages.<sup>1</sup>

### Reused and close-at-hand timber

The problems encountered in obtaining high-quality timber were so numerous that whenever a new building project began, it was always preferable to recover wooden elements from existing structures whenever possible. A clear example is offered by some Valencian documents: in 1507, the Duchess of Gandía commissioned the construction of some new rooms for her house, the Borja palace in Valencia, from master builders Joan Perales and Guillem Gilabert. The first chapter of the contract specifically states that some existing wooden ceilings are to be dismantled and—securely—stored within a specific part of the building in order to keep them in good condition until their eventual reuse (FALOMIR 1996, doc. 9).

Of course, this was not always possible, and when wood could not be reused, then usually the closest at hand had to be used, even if this was not the most suitable for construction. This is explained by the precariousness of existing transport routes before the industrial revolution, and may be illustrated with a document that comes precisely from Tortosa, where, in 1517, the tower of a small settlement in the township of Garidells was being built. According to the book containing the municipal agreements of that year, the municipal government decided that timber should be obtained as close to the construction site as possible. That is to say, the *Consell* agreed to pay for the services of a carpenter, lumberjack or other specialist to cut down all the timber necessary to build the tower, but written references specify that tree trunks were not to be harvested from the area usually exploited, the mountains on the right bank of the Ebro River, but from the left bank, next to the construction site, or possibly from the very site itself (VIDAL 2008: 198).

Large enterprises, however, required much more extensive resources. The documentation reflects very clearly that whenever the construction of a particularly outstanding building project was to be initiated, such as, for example, an expansive wooden roof, or even a building that required

<sup>1</sup> \*Research projects: HAR2010-18498 and HAR2013-46400-P.

This text is derived from J. Domenge, J. Vidal, "Construir i decorar un teginat: del document a l'obra," *Quaderns del Museu Episcopal de Vic*, VI, 2013, pp. 9-46. On the management of Tortosa's forests in the medieval and early modern era, see A. Curto, "La gestió dels Ports durant la baixa edat mitjana," *Recerca*, 5, 2001, pp. 21-52; T. Forcadell, "La gestió forestal dels Ports de Beseit al segle XVII. Explotació i conflictes entre la Sénia i Tortosa," *Lo senienc*, 6, 2009, pp. 16-32. I would like to thank Pere Verdés and Xavier Miranda for reading and commenting on this text, and Rafael Gómez-Moriana for translating it into English.

large scaffolding and wooden formwork for stone vaults, the provenance of the material was a question to be addressed with foresight, in exactly the same way that stone quarries had to be managed for the construction of cathedral temples. A report regarding the construction of the roofs of the palace of the *Generalitat* of Valencia in the first quarter of the 16<sup>th</sup> century is illustrative in this regard: in July of 1515, Jaume de Pertusa, who was in charge of cutting and transporting the timbers required for the job, warned the Valencian deputies that in order to be available in 1517, and so that they may be cut beneath a “good moon”, it would be necessary to cut the trees “during the moon of the present months of July or August (of 1515).” That is to say, two years before construction (ALDANA 1992: da. 33).

Thus, whenever the Crown of Aragon embarked on large construction projects in which wood was a protagonist, both the capital of the Kingdom of Valencia, situated on the Turia River very close to the Júcar River, and the city of Tortosa, an important enclave along the lower Ebro River’s course, were of special relevance.

### **Valencia as a major wood distribution centre**

The city on the Turia River distributed wood coming mainly from forests in Castile—especially from what is today the province of Cuenca—and from Aragon.<sup>2</sup> A multitude of references demonstrate this. For example, in 1406 King Martí I, called the Humane, who wanted to build a Celestine monastery in Barcelona, requested from the councillors in the Aragonese towns of Teruel and Vilel “lots of wood, which would be most convenient to harvest from our seignery, for Castile no longer supplies what it used to.” Concretely, the monarch asked the municipal authorities to supply him with “a thousand pine trees; the most beautiful that can be found” from the pine forests in those municipalities.<sup>3</sup> The documents indicate, therefore, that Castilian timber was habitually used in the Crown of Aragon even though the supply of this material was not without its ups and downs.<sup>4</sup> But additionally, they indicate that the King was not satisfied with any type of tree, insisting that he wanted the most beautiful pine trees: structural strength and beauty of the grain were features to be considered when stocking up on this material.

Sometimes timber was transported by land, but more often it was transported along the aforementioned watercourses: the River Júcar (up to Ràfol, near Xàtiva), and the rivers Cabriel and Turia up to the city of Valencia. King Jaume I signed a privilege in Alzira, on 30 January 1267, stipulating that any timber felled within the Crown of Aragon was permitted to be transported to Valencia along these rivers. Storage took place mainly in the Rambla del Real, as reflected in the view painted in 1563 by Anton van den Wyngaerde, court painter of King Philip II. Many

<sup>2</sup> On the Valencian centre, see ARCINIEGA 2010; GARCÍA MARSILLA, IZQUIERDO 2014; IZQUIERDO 2014.

<sup>3</sup> Archivo de la Corona de Aragón (ACA), Cancillería, Reg. 2248, ff. 206r-v (document cited in ADROER 1978: doc. 131).

<sup>4</sup> Although the document cited is from the beginning of the 15th century, this continued to be the case during the modern age. See ARCINIEGA 2010: 295-297.

other documents prove that the Valencian authorities had the power to assure the unencumbered passage of wood through the small dams of mountain villages. For example, if the water level of a river was too low for logs to float, the capital could order dams to be opened so that the river level increased. At the same time, the city would cover the repair of dams, mills, and canals damaged by rafts flowing along these watercourses. The weir of Vilamarxant suffered damages for this reason in 1516, as reflected in reports signed by master stonemasons Joan de Burgos and Joan Corbera. The structural damage was seemingly caused when the *ganxers*, the professionals who guided timber booms, were manoeuvring a shipment of tree logs belonging to Jaume de Pertusa: this was probably the very wood that was subsequently utilized in building the aforementioned roofs of the Generalitat’s palace (GLICK 1988; FERRER 1990; SANCHIS, PIQUERAS 2001; ARCINIEGA 2010 and 2011).

### The case of Tortosa

Wood was also distributed out of Tortosa by floating tree logs downstream, in this case along the Ebro River and its tributaries, including the Segre. Again, a view by Anton van den Wyngaerde, this time of Lérida, provides valuable graphic testimony of this transport method since it offers a snapshot of log booms floating down the Segre River on their way to Tortosa (Fig. 1). This would indicate, without doubt, that this city was the commercial centre for most of the wood originating from the Pyrenees, but we should also keep in mind that timber reached the Ebro River not only from the Segre-Cinca tributary; all tributaries to this river, in Aragon, Navarre and Castile, could have nourished an impossible to quantify timber flow (PALLARUELO 1984; FERRER 1990; BLÁZQUEZ, PALLARUELO 1999: 53-56).

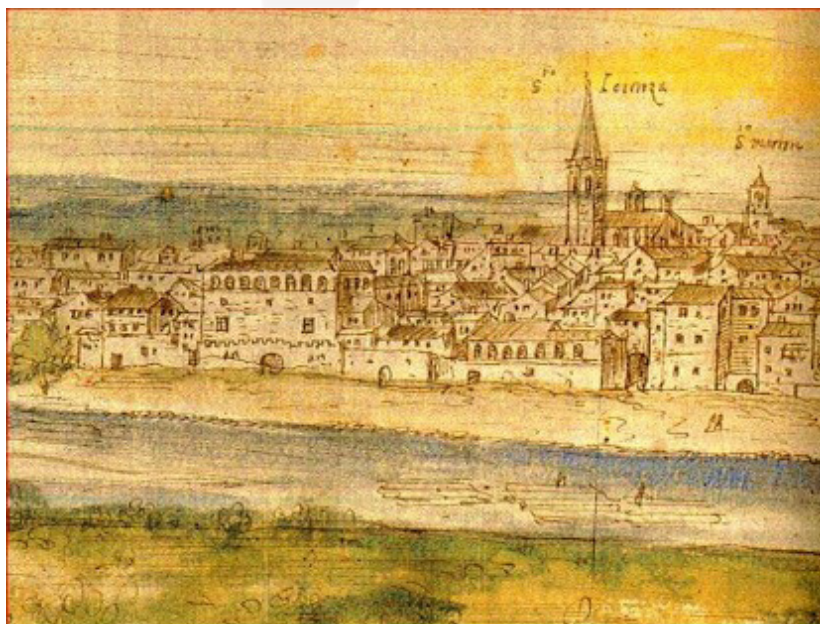


Fig. 1. View of Lérida by A. van den Wyngaerde, with the rafts going down the river Segre

It seems that the use of rafts to transport timber was habitual in the Ebro River for many centuries: it is worthwhile remembering that it was still in use at the end of the 19<sup>th</sup> century, even though railroad networks had already been developed. As Federico de Arias wrote in his treatise on carpentry, rivers and “water flows of sufficient depth are used for directing logs”. According to his description, the method seems simple and efficient: “rafts, booms, or trains could be assembled no wider than the narrowest parts of rivers to permit their passage; for this reason logs have to be positioned lengthwise parallel to the water flow, and in a quantity in accordance with the prescribed width, all united by means of ropes or ligatures made from branches that should pass through openings drilled in the leading logs for this very purpose” (ARIAS 1893).<sup>5</sup>

Now, the case of Tortosa is different from that of Valencia, since southern Catalonia also had what we could denote a large productive capacity. Tortosa—its territorial limits included practically all of what are today the southernmost counties of the Principality of Catalonia, the areas of Baix Ebre and Montsià—together with bordering towns and regions in Aragon (Beceite) and Valencia (Morella and its villages, the *tinença* de Benifassà), was a major timber-producing area. Its most important forests were situated in the area referred to today as Ports de Tortosa-Beseit, a range of hills that continue on into the Valencian county of Els Ports, although abundant amounts of timber were also extracted from the Cardó range, on the left bank of the river. Pine trees of considerable size grew here, turning Tortosa into a major centre of timber distribution.

### Notes on Tortosa’s wood commerce

Without attempting to evaluate the many jurisdictional conflicts that have taken place throughout history<sup>6</sup> and the timber that was furtively extracted beyond the control of the *Consell*, since time immemorial—probably since the enactment of the town charter in 1149—the city took over the control and custody of these forested zones, a control and custody that were countersigned in 1320 by a privilege from King Jaume II. According to this document, Tortosa’s *universitat* had the power and the obligation to safeguard the forests within its municipal boundaries, that is to say, it had to manage them, appointing guardians (*vedalers*) and establishing regulations (*establiments*). The royal privilege allowed the monarchy, as well as citizens, to extract timber for their own use, but prohibited to sell it to foreigners, a law which—intended to prevent deforestation—would be repeated once and again in municipal regulations from the one of 1341 onwards, the first one we know of regarding this matter (MARÍ 1994: doc. 54; CURTO 2001: 28-29). Of course, both the Crown and the City interpreted the “own use” clause rather broadly, and so Tortosan wood ended up being used in any sort of royal construction or any building whatsoever developed by the monarchy or the government (deputies, *bailes*, royal lieutenants); for its part, the *Consell* even

<sup>5</sup> On this means of timber transport, see PALLARUELO 1984; ARCINIEGA 2010. The system used by the Crown of Aragon is exactly the same as that used elsewhere in Europe, as explained, for instance, in FURESTIER 2007.

<sup>6</sup> Regarding the Middle Ages, see MIRANDA 2000.

donated timber to those who provided valuable services to the municipality, as happened in 1380 with Bernat Miquel, secretary to the King.<sup>7</sup>

We should also keep in mind that all this logging had to be done with a licence,<sup>8</sup> and that timber was not actually felled by the King nor by most inhabitants themselves, but rather by the city's lumberjacks and carpenters. As we just mentioned, if these professionals didn't want to break the law, they could only sell wood—in reality it was their labour that they were selling, not the wood—to citizens who, in turn, could only use it for their own purposes, but with one exception: the wood from the forests near Morella and Benifassà—towns situated within the Kingdom of Valencia and, therefore, outside the limits of the city—in which Tortosa had the right to fell trees, according to an arbitration sentence of 1297.<sup>9</sup>

Perhaps certain feudal, municipal, royal or state taxes were broadly applied on wood, and this is without doubt a topic that must be studied in depth, although unfortunately the documentation that we require to measure the volume of business and the profits this entailed for the city is rare and discontinuous.<sup>10</sup> In this sense, Albert Curto (2001: 51), author of a study of Tortosan forest management in the Middle Ages, affirms that "we cannot ascertain when the export of wood began to be subjected to taxes or rights." The written *Costums* (rubric 1.1.5), dating from the end of the 13th century, state that citizens must pay their lordship a *quaranté* of the amount of pinewood cut down, but this right ended up being ineffective in the 14th century, when—as we have already mentioned—the sale of timber became illegal in the Port.

In fact, as far as we know today, the only municipal document from the 1300s concerning the regulation of wood trade and commerce makes no mention of timber "produced for personal use", but rather of timber descending the Ebro River, and it imposes no taxes: it establishes that all timber susceptible to being sold must be displayed publicly for two days, or otherwise be subjected to a fine of 10 *sous*, and in the event of it being resold after being sold already, it would have to be publicly displayed for one day, or otherwise be subjected to the same fine. It also establishes that wood must be sold, according to the agreed upon price, to all those who wish to buy it.<sup>11</sup> Undoubtedly, these measures, specified in May of 1370 for a period of validity of nine years, were intended to, on the one hand, guarantee the supply of wood for the city, and on the other avoid that its business be concentrated in only the hands of a few, as a monopoly,

<sup>7</sup> ACBEB, Fons de l'Ajuntament de Tortosa, Llibre de Provisions, 13, f. 62r.

<sup>8</sup> According to CURTO 2001: 25: "it is believed that there was once a register of licenses, unpreserved. It is possible that all licenses, applications for logging, and receipts, might have disappeared ..." Only indirect references to these licenses remain, collected between 1339 and 1480 in BAYERRI 1960: 384-387.

<sup>9</sup> MIRANDA 2000.

<sup>10</sup> For an example of a taxation system that existed in a Medieval Catalan town, see ORTÍ 2000.

<sup>11</sup> Arxiu Comarcal del Baix Ebre (ACBEB), Fons de l'Ajuntament de Tortosa, Llibre d'Establiments, 5, ff. 44r-v. CURTO 2001: 25 states that "in the catalogue for the year 1574, there are references to wood display books, but none have been preserved to this day".

which is perfectly documented in 16<sup>th</sup>-century Zaragoza in the case of the Bombau family. In 1560, the authorities of the Aragonese capital prohibited the resale of wood under the pretext that some people were hoarding all the material arriving in the city from the Ebro and Gállego rivers, and five years later, in 1565, they were denounced and forced to cancel the agreements they had signed with their Pyrenean suppliers. Of course, Joan Bombau defended himself alleging “rancour” and “bad faith” on the part of his complainants, but he included, in his defence, a few words that offer a key to understanding the problem: he was accused of having made illicit deals with woodcutters because he had created a “monopoly and concert so that these could not sell timber to anybody else” (BLÁZQUEZ, PALLARUELO 1999: 54-55).

However, a document from 1494 makes reference to the existence of a “*treta de la fusta*” leasehold. In other words, toward the end of the 15th century the city leased a tax on wood exported beyond its municipal boundary.<sup>12</sup> And if we analyse carefully some news items from the end of the 15th century we might be led to think that a tax charged on domestically produced wood must have been extraordinary, as it was established only from that moment onward and must be linked to the economic crisis within which the city found itself: in 1484, under the necessity of obtaining a “large sum of money”, a tax of 12 *diners* was charged for every batch of wood, sawn or unsawn, that left the municipality, except for wood descending the river or wood that was excluded from the tax (in fact, the 1370 document previously cited also indicates that wood flowing on the Ebro River was not subject to fiscal deduction by the city).<sup>13</sup>

It seems, then, that in this context, at the beginning of the 1490s, the forest became overexploited, mostly by Biscayans who felled trees without a license, or who cut more wood than the permit they had been issued allowed, or who cut trees out of season. For this reason, and because of the complaints from local carpenters, the university chose to establish some new, stricter regulations in 1493. The leaseholders affected by the treaty established ten years earlier then protested, so that finally the city withdrew the new regulation.<sup>14</sup>

In any case, although documents from the 1200s, the 1300s, and the 1400s don’t reveal it, documents from the early modern era do reveal the existence of a tax on wood “taken from the present city or passing through the present city and its municipal boundaries” between the 16th and 18th centuries, an imposition that could be increased during times that were especially beneficial for municipal finances. Thus, in the meeting of the *Consell General* on March 19th 1566, at the same time that it was resolved to issue wood extraction licenses for the construction of Barcelona’s shipyards, the *procuradors* and the *consellers* also decided to augment “*lo dret de*

<sup>12</sup> ACBEB, Fons de l’Ajuntament de Tortosa, Llibre de Provisions, 65, f. 24r.

<sup>13</sup> ACBEB, Fons de l’Ajuntament de Tortosa, Llibre d’Establiments, 10/1, ff. 13r-v; Llibre d’Albarans, 2, ff. 120r-121v.

<sup>14</sup> ACBEB, Fons de l’Ajuntament de Tortosa, Llibre de Provisions, 64, ff. 47r, 63v; Llibre d’Albarans, 2, ff. 121v-122v; Llibre de Provisions, 65, ff. 13v, 24r, 26r-v, 32v.

*la fusta*”.<sup>15</sup> This state of affairs terminated in 1748, when Ferdinand VI promulgated a decree by which the Spanish Navy was charged with maintaining “hills situated in the vicinity of the sea and navigable rivers”.<sup>16</sup>

### The Pontoon Bridge and terrestrial transportation

A geographic characteristic, in conjunction with the city’s urban morphology, allowed the *Consell*, from the 13th century onward, to be completely prepared to manage large quantities of timber for construction. Tortosa had the only stable bridge crossing the Ebro River between Zaragoza and the river’s mouth; it was therefore a required point of passage for road travel along the Iberian Mediterranean coast. At the same time, the characteristics of the lower Ebro River impeded the construction of a fixed bridge before the last decade of the 19th century; until then, there was a wooden bridge supported by boat-like pontoons that required constant maintenance, the so-called Bridge of Boats. For this reason, the city saw itself obliged to find a way to obtain and store in good conditions the material necessary for this infrastructure (PONT DE BARQUES) (Fig. 2).



Fig.2. View of Tortosa by A. van den Wyngaerde, with the Pontoon bridge and the area where the timber was stored and manipulated.

We know of the existence, in the 14th century, of a House of the Bridge –constructed and reconstructed on various occasions, of course– in which lumber was stocked for guaranteeing passage over the Ebro as well as remaining municipal works. We also know that this building, over time, also came to store lumber that was sold and distributed to other places. In fact, news documents tell us that behind the House of the Bridge there was a pond where wood was soaked, covered with reeds, and that this was the part of the city where the sawyers worked. Furthermore, the 1341 decrees specify that logs destined for sale had to be brought and unloaded at the head of the bridge, and that that was where wood was to be displayed to potential buyers. Wood was not allowed to be sold in any part of the city.<sup>17</sup>

<sup>15</sup> ACBEB, Fons de l’Ajuntament de Tortosa, Llibre de Provisions, 68, ff. 118r, 119r; Llibre d’Albarans, 9, f. 300r; Llibre d’Albarans, 17/1, ff. 97r-99v.

<sup>16</sup> On the period posterior to this bylaw, see MIRANDA 2001.

<sup>17</sup> CURTO 2001: 32-33. On the House of the Bridge, see UTGÉS 1993; VIDAL 2008: 217-220, with news from the 14<sup>th</sup>



It is very likely, therefore, that this was the part of the municipality where a good portion of the tree trunks arriving in Tortosa, by one way or another, were transformed: for someone interested in the history of architecture and construction this entails, above all, that on some occasions building material was nearly fully readied for construction usage at its point of distribution. In this sense, the content of a Royal letter from 1399 that discusses “certain lumber” from Tortosa “already worked and gessoed, and bundled and wrapped in certain reeds”, that is to travel to Barcelona to be used in the construction of the Royal palaces. The lumber had to be transported to Barcelona by sea, accompanied by a “*feel*” of the Royal palace, that is, by a person trusted by the Crown, which tells us something of the special care and protection that the transportation of this material was considered worthy of.

The chancellery document requires, moreover, that the lumber be stored in a secure location upon its arrival in Barcelona to prevent it from becoming wet. These are indications of the interest with which this ready-made building material was treated.<sup>18</sup>

Now, it would seem logical that beams and other elements created from tree trunks would be given their final and definitive form once these were already transported to a construction site. To be sure, carpenters and lumberjacks played important roles at construction sites, including ones for stone buildings, at least from a quantitative perspective. The log books of the construction of the Minor Royal Palace of Barcelona, from the 1360s and 70s, represent a good example of this, as they contain records of numerous wages paid to men “who delivered and stored *taules, costers e cabirons* [different types of lumber] cut by sawyers, from the lumberyard to the depot of the palace in question”. Incidentally, the accounting ledgers of these Barcelonan works often specify the origin of the materials used: indeed, Valencia and Tortosa (DOMENGE, VIDAL 2013).<sup>19</sup>

The need to accumulate large quantities of boards for the Bridge of Boats and the constant movement of logs in the river and on the hillsides around the city reveal a great deal of information about this material’s transportation, not only by fluvial but also by terrestrial means, since there were few water courses of any importance between Tortosa’s hills and the river, thereby necessitating terrestrial transportation. In the series of documents belonging to the municipality, there appear, since the 14th century, references to the construction, repair, and maintenance of so-called paths of *rossec* (towing), “in a manner that is advantageous for laden beasts”, as stated in a municipal agreement of 1380. A century later (1488), at a moment when –as we have already said– the number of felled trees increased, a citizen is recorded to have offered to open a path for the emergence of “good wood which, lacking a way out, could not be harvested”; this anonymous

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and 15<sup>th</sup> century. The building is renovated once again in 1620, under the direction of master builder Cristòfol Bruel, according to documents from ACBEB, Fons de l’Ajuntament de Tortosa, Llibre d’Albarans, 8, ff. 224v-225v.

<sup>18</sup> ACA, Cancillería, Reg. 2243, f. 4r (cited in ADROER 1978: doc. 7).

<sup>19</sup> ACA, Apéndice General, n. 1000, passim and MR, Reg. 2409/1, passim. On the construction of Barcelona’s palaces during the reign of Peter III, see CID 1994 and 1997.

character promised to “provide an exit and a path for this said wood, under the condition that nobody else use this path unless they helped to pay for it”.<sup>20</sup> Things continued much the same in the modern age. In 1632, since the cost of maintaining the “*camins de rossech del Port*” was very high, and since their condition worsened every day by the very towing of tree trunks along them, the *Consell* established a toll to be charged for any kind of trunk, sawn or unsawn, that entered the municipal boundaries.<sup>21</sup>

It is clear, then, that tree trunks were displaced from forests to the already mentioned storage area by being pulled behind large animals, especially mules. It can be deduced from documents –always difficult to interpret– that depending on the volume of wood, either one or two mules were needed. This fact may be why the volume and dimensions of lumber eventually ended up being typically referred to as being of either of “one mule” or of “two mules”. Documentary references to “trunks of one mule” (that is, the quantity that could be towed by one animal) and those of “two mules” (that is, the quantity requiring two mules to be towed) become especially meaningful in the light of some photographs dating from the beginning of the 20th century, images which reflect the perseverance of these traditional practices until quite recently (Fig. 3-4). Of course, if the paths permitted it and the wood was adequately dimensioned, then it was hauled in carts that were normally pulled by bulls (MIRANDA 2001).



Figs. 3 & 4. Transportation of timber by one mule and two mules (respectively) in the mountains of Tortosa

### Of good resin and beneath a good moon

All this wood had to pass a certain quality control: it had to be dry, of good *melis* –pine wood rich in resin– and it had to be planed well. Documents reflect the existence of selective grades through expressions such as: “*cabirons de bon melis, serradizs e ben planegats*”, “*bona fusta de pi bort, fresc*” or “*bona, exuta, nova y de bon melis*” (DOMENGE, VIDAL 2013). We also know that the best

<sup>20</sup> VIDAL 2008: 466; ACBEB, Fons de l’Ajuntament de Tortosa, Llibre de Provisions, 63, f. 87r.

<sup>21</sup> ACBEB, Fons de l’Ajuntament de Tortosa, Llibre d’Albarans, 9, f. 300r et seq.

exemplars of wood were used in the most important works, while those of lesser quality were used to build works of lesser importance. This becomes very clear in an order issued by Martin the Humane to the workers of the Major Royal Palace of Barcelona in 1403. In the text, the King selects wood according to the representational importance of the rooms: the clerkship was probably on the ground floor, and so to clad it, the worst lumber was to be used from the lumber selected for constructing the building; while the most solemn halls were situated on the *piano nobile*, for which the monarch wished to reserve the most beautiful timbers (GIRONA LLAGOSTERA 1913-15: 113).

The already cited Tortosan ordinances of 1341 stipulate that young pines (*pin poll*) should not be felled, unless their trunks measure 20 palms lengthwise, which is about five meters; additionally, these are always to be felled “beneath moon” or “beneath a good moon”: the same occurs throughout the European continent. And the problem here is that it is not always clear just which moon is good, or when is the best time to cut down trees. We might remember that for Vitruvius, the best moment to cut down trees is in early autumn or winter, since during those periods, trees are not using their energy on leaves or fruit. Another authority from antiquity, Pliny the Elder –whose testimony was recorded by Filarete– believed that trees should be cut down between the August moon and the start of the autumn season. The author of the Renaissance treaty known as the *Veintiún libros de los ingenios y máquinas de Juanelo Turriano* (*The Twenty-One Books of Engineering and Machines of Juanelo Turriano*) also believes that August is the best time for felling trees, while Palladio and Fray Lorenzo de San Nicolás are in favour of wintertime cutting and waning moons. The news records from the 1500s preserved in the Archive of Cuenca –an important area for the harvesting of wood, as we have already noticed– indicate the possibility of felling trees in autumn or in winter, preferably beneath February’s waning moon, while Saragossa’s ordinances for carpenters of 1446 rule that trunks should be cut between the last lunar quarter after the start of summer and the first quarter moon of January, and states that Pyrenean wood arriving in the Aragonese capital should be cut beneath a good waning moon and clear sky, from noon downward, and when the soil is not too moist”. Tortosan documents tell of cutting on clear days and new moon, from August to March –or May, in other occasions– as it would be detrimental to cut between mid-March and July, when trees “are in sap”; in any case, it is also recognized that the appropriate cut depends “on the specific nature of each and every tree”.<sup>22</sup>

Thus, in the majority of cases, a good moon is considered to be one that is waning, especially in winter, although many exceptions are possible depending on the different places, periods, and also the different kinds of wood. For example, in Medieval and early modern Provence, deciduous trees were recommended to be cut beneath a decrescent moon, and evergreens beneath a crescent moon. As Ph. Bernardi (2007: 69-70) affirms, what is truly important is that it was believed that a

<sup>22</sup> This topic is summarized in ARCINIEGA 2010: 294-295. The bylaws of the city of Tortosa include this item since its first edition, in 1341, but there are also other documents that make reference to this question, and they don’t always coincide.

good and a bad moon existed, and that harvest activity was guided by this conviction. This is why we find that certain building projects –such as Santa María de la Murta de Alzira, from the 17th century– were considered failures because their wood “was cut beneath a bad moon”; this is why Jaume de Pertusa insisted before the Valencian deputies, in 1515, that they should order the wood they needed for 1517 quickly, otherwise it would not be cut under a good moon; and –among other reasons– this is why the Tortosan authorities decided to implement restrictive regulations on the cutting of wood in 1493: according to this document, “some malevolent people, with severely damaged consciences, with greed and great ambition to profit illegally, cut and have cut timber at inappropriate times and beneath bad moons, from which irreparable damage follows, because this wood, being in construction, rots, and so those who bought and used it are in danger, because finally, with ease and in little time, the building, by the fault of this wood, succumbs.”

### *A map of the Tortosins*

Although it is difficult to make an exact list of the cities to which Tortosan wood was shipped regularly, documentary sources, from both the city of Tortosa as well as the points of reception, could help us to establish a map that would permit us –in the future– to be able to determine with precision the radiating routes followed by this material. In this sense, one of the most interesting documents, although it concerns only a partial list, is the log book of the official who collected the tariff on wood circulating within Tortosa’s municipal boundaries, as established in 1484 by the already cited municipal agreement. Here, the transporters’ names are recorded, as is the quantity of material hauled, and the final destination of the wood: Alicante, Barcelona, Tarragona, Mallorca and Valencia; that is to say, the Crown of Aragon’s largest maritime cities.<sup>23</sup>

Another source from which the radiant routes of Tortosan wood could be traced are the books recording expenses. Francisca Vilella’s study (2001) of these documents, which collect information from 1473-74, indicate that during these years, wood was shipped to Barcelona, Mallorca, Valencia and Naples. Notary documents and the indirect references to tree-cutting licenses preserved by municipal bodies indicate similar destinations.

A letter written by María de Castilla, lieutenant of her husband, Alfonso the Magnanimous, is significant. In 1449 the Queen expresses to the governors of Tortosa the necessity to acquire timbers from Tortosa for the construction of “her monastery of the Holy Trinity of Valencia”; and adds that these are indispensable for the proper development “of her Holy work”. The text describes the qualities sought by the master builders for this material: they wanted “twelve, or at least ten large antennas”, which is to say large trunks of pine, since in the Kingdom of Valencia “there is no place from which such large trunks as needed could come”.<sup>24</sup> It’s important to keep in mind that Valencia was one of the largest distribution centres for sawn lumber in the

<sup>23</sup> ACBEB, Fons de l’Ajuntament de Tortosa, Registre 1837 (paper).

<sup>24</sup> Document cited in CURTO 2001: 51.

entire Catalan-Aragonese confederation: and it also had to approach Tortosa to obtain material of certain characteristics, in this case pines of great length, rectitude and width.

In the 12th century, the Arab geographer al-Idrisi wrote that the hills of Tortosa had “pines of excellent quality, unequalled elsewhere, in terms of length, width, and the beauty of the grain”: as we saw earlier, these were exactly the same qualities that King Martin demanded from the authorities of Teruel and Vilel in 1406 (longitude, resistance and beauty). Al-Isidri also commented, moreover, that Tortosan timber “was transported all over the world” (...) and added that “its wood is used to craft the alfarje ceilings of royal palaces, to equip ships with masts and booms, and to build military inventions,” emphasizing that it was with this material that the wood panels of the Great Mosque of Cordova were carved (AL-IDRISI 1901: 181). Thus, the success of these pine trees, valued not only for their utility and functionality, but also for their aesthetic qualities, were reflected in diverse Mediterranean languages, such that in both Mallorca as well as the north of Africa, great wooden beams are still referred to today as “tortosins”.<sup>25</sup>

## Conclusions

In short, we can say that, in the area of the former Crown of Aragon and beyond, in some parts of the western Mediterranean, the timber distributed from Tortosa was a material widely used in construction, especially when large and durable logs were needed. The existence of these construction needs and the need to maintain in good condition the largest city bridge, or pontoon bridge, built entirely with timber, entrusted the Consell with the management of logging, storage, transport, and sale of the product for centuries, as well as with ensuring the conservation of forests and roads that enabled its extraction

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<sup>25</sup> In the case of Mallorca, see: Diccionari Català, Valencià, Balear, entry word “tortosi”; in the case of northern Africa, see PIQUERAS, FANSA 2010: n. 7.

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## APPENDIX

## 1

1370 mayo 30. Tortosa

*Ordenanza del Consell de Tortosa sobre la compraventa de la madera que baja por el río Ebro.*

Arxiu Comarcal del Baix Ebre, Fons de l'Ajuntament de Tortosa, Llibre d'Establiments, 5, f. 44r-v

Stabliment de la fusta que per lo riu aval

Ítem, han stablit e ordenat que algun revenedor o revenedora de fusta, ne encara alguna altra persona de qualsevol estament, ley o condició sia, no gos comprar per revendre ni per traure fora los térmens de la ciutat fusta de Casp ne encara alguna altra fusta que venga per lo rech avall ans que no sia arribada a la ciutat, ni encara après, dins espay de II dies après que sia venguda, ans aquella fusta, après que venguda serà, [aque]lls de qui serà, si venal emperò serà, degen tenir || de manifest a vendre a tota persona que comprar ne volrà dins los dos dits dies. E qui contrafarà o vindrà, sàpia que pagarà de pena, per cascu[na ve]gada que contrafarà o vindrà, X sòlidos.

Ítem, han establít e ordenat que tot revenedor o revenedora de fusta e tota altra persona de qualsevol ley, estament o condició sia que comprarà de la fusta desús dit per revendre o per navegar, haja a tenir aquella de manifest per tot aquell dia en què la comprarà o en terra la traurà, és assaber, si serà de matí fins al vespre, e si serà altra ora fins en l'altre dia a aquella ora metexa, e vendre a tothom que n vulla per lo preu que li costarà. E qui contrafarà o vindrà sàpia que pagarà de pena per cascuna vegada que contrafarà o vindrà X sòlidos.

E volen los dits lochtinent de batle e prohòmens que les penes que dels presents stabliments exiran o vindran sien partides segons Costum de Tortosa.

E qui les dites penes pagar no porà o no volrà, sàpia que estarà pres per cascun sòlido un dia en la Çuda, sots clau.

Los quals stabliments volen que duren e hajen fermetat d'ací IX anys primer vinents e contínuament complits.

E si dupte o duptes dels presents stabliments exiran o vindran, que aquells sien declarats e in[ter]pretats per los dits lochtinent de batle e prohòmens.

1484 octubre 8. Tortosa

*Texto de la ordenanza municipal según la cual se establece una carga de doce dineros por cada tirada de madera que se saque de la ciudad de Tortosa.*

ACBEB, Fons de l'Ajuntament de Tortosa, Llibre d'Establiments, 10/1, f. 13r-v

Die VIII mensis octobris anno a Nativitate Domini Millesimo CCCC LXXXIII

Per juhí dels honorables jutges ordinaris, present lo honorable sotsveguer, instant lo honorable en Pere Pruner, notari, síndich de la ciutat de Tortosa, són stats adjudicats los stabliments infrasegüents:

Ara hojats que us fan a saber, per manament de la senyoria e dels prohòmens de la ciutat de Tortosa, lo magnífich mossèn Johan Ycard, donzell, lochtiment de batle per lo molt noble don Johan de Rebolledo, batlle de la dita ciutat, e los prohòmens dessús dits, atenents e considerants les moltes e grans necessitats en les quals la dita ciutat és posada e constituïda, axí per grandíssima inòpia e fretura de forments, per la gran sterilitat del temps que de present és, per rahó de la qual és mester e necessari gran suma de pecúnies per obs de haver forments per la provisió de dita ciutat necessaris, com encara per molts altres càrrechs e crèdits de moltes e diverses quantitats a solució de les quals la dita ciutat és tenguda e obligada, e altres necessitats occorrents, per causa e rahó de les quals, e per sublevar dita ciutat de les dessús dites necessitats, sia cosa convingent e necessària de augmentar les imposicions, e imposar e exhigir aquelles e altres drets, les quals, en virtut dels reals privilegis a la dita ciutat atorgats, e altres, de justícia augmentar, imposar e exhigir podera, e per tals e semblants necessitats tals o semblants drets e imposicions han acostumat imposar, augmentar, col·ligir e exhigir. Han per ço provehit, stablit e ordenat que qualsevulla persona de qualsevol ley, stament o condició sia que traurà o traure farà fusta de la dita ciutat e del terme de aquella, haja e sia tenguda pagar la imposició || o dret de dotze dinés per tirada de dita fusta, axí serrada com per serrar, al clavari e receptor de les pecúnies de dita ciutat o a la persona la qual per collir e exhigir dita imposició e dret serà deputada. E açò sots pena de deu lliures e perdre la fusta, la qual pena se haze a partir segons costum de la dita ciutat. E més, emperò, e exceptada la fusta que vendrà a la dita ciutat de jusa per lo riu, de la qual no volen se pague dita imposició o dret de dotze dinés per tirada. E volen e ordenen los dits magnífichs batle e prohòmens que ans de carregar e traure dita fusta sien tenguts aquella manifestar al collidor per dita ciutat deputat, e pagar dit dret, sots la dita pena.

Volens los presents stabliments sien duradors per temps de cinch anys, del dia present en avant comptadors.

E si dubte o duptes insurgiran dels presents stabliments, aquells hagen ésser interpretats e declarats per los magnífichs lochtinent de batle e procuradors.

Ycard.

### 3

1492 junio 2. Tortosa

*Acuerdo del Consell de Tortosa según el cual se acuerda que se hagan ordenanzas para evitar que los bosques de la ciudad sean destruidos por los vizcaínos que talan madera de forma abusiva.*

ACBEB, Fons de l'Ajuntament de Tortosa, Llibre de Provisions, 64, f. 47r

E més, és stat provehit que, attès se ha informació que molts biscaïns qui stan e viuen ara en la present ciutat fan gran strall e dan en lo Port de la present ciutat, enderrocant e tallant molta fusta, en tant que si no·ls és prohibit totalment destruïran tot lo Port, lo que succehirà en grandíssim dan e dampnatge de dita ciutat, sien per ço fets stabliments, ab los quals sien prohibits dits biscahins de no poder tallar fusta en los Ports e térmens de dita ciutat, ab bones penes. E, noresmenys, ab dits stabliments, sia provehit que los ciutadans de dita ciutat qui viuen de tallar, enderrocant e obrar dita fusta, no puixen més haver ni pendre de dita fusta sinó tant com feyen dits biscaïns.

### 4

1493 julio 4. Tortosa

*Ordenanzas establecidas por el Consell de Tortosa sobre la madera que se extrae de los montes de la ciudad.*

ACBEB, Fons de l'Ajuntament de Tortosa, Llibre d'Albarans, 2, f. 121v-122v

JHS

Die quarta mensis julii anno a nativitate Domini MCCCCLXXXIII

Per juhí dels honorables micer Johan Vello e d'en Nicholau Querol, jutges ordinaris, present lo honorable veguer, foren provehits e adjudicats los stabliments infrasegüents, instant e requirint

lo discret en Bernat Xies, notari, subsíndich de la present ciutat de Tortosa, los quals stabliments són del tenor següent:

Stabliments del Port e de la fusta de aquell, e de l'orde que se ha de tenir sobre dita fusta.

Ara oyats que us fan a a saber, per manament de la señoria e dels pròmens de la ciutat, lo magnífich micer Pere Conesa, doctor, regent la batlia de la ciutat de Tortosa, e los pròmens dessus dits, atés los molts dans e fraus per moltes e diverses vies [exquisides] per diverses persones se donen e s cometen en lo tallar de la fusta del Port de dita ciutat, lo que redunda en gran dan, interès e prejuhí de la magestat de nostre señor lo rey e ciutadans poblats en dita ciutat e terme, per ço, per proveyr a dits fraus, dans, interessos e prejuhins, han stablit e ordenat e per quan jatsia fins lo dia present ningú no pogués tallar fusta de dit Port e altres fochs del terme sens licència de dits batle e pròmens, per ço, per quant en lo dar de dita licència no s feya lo degut, ans molts ne han abusat sots títol e color de dita licència, tallant molta més fusta de la que en dita licència era continguda, per ço han ordenat que totes ses licències fins lo dia de la publicació dels presents stabliments donades sien revocades, com ab les presents revocam. E no és, emperò, de les licències que fins dita e present publicació no són stades executades, en així que de dites licències les quals no són stades eixecutades no pusquen usar, ans novament hagen obtenir altres licències. E qui contra u farà, encórregua en pena de L sous.

Més, han stablit e ordenat que per dits batle e pròmens sia deputada persona o persones les quals tota la fusta que en dit Port se trobarà tallada regonèixer e meta en recort per saber de qui és e en quin loch sien tallada, e sia sien trobat ésser tallada en lo vedat sens licència, e més avant del que en dita licència serà contingut, que sia presa a mans del dit batle e pròmens. E si dita fusta serà tallada en los amprius, sia examinat si és stada tallada per als ús e || amprius dels ciutadans. E si no és tallada a ús e amprius dels ciutadans, sinó per trestegar, que sia presa per semblant a mans dels dits batle e prohòmens, si insta la justícia perquè no sia fet prejuhí ni interès a nengun que no sia personal alguna que en les coses sobre dites ho a qualsevol de aquelles gos fer empaig algú, sots pena de L sous.

E per quant se ha informació que algunes gents malèvoles, en gran dan de llur consiència, ab molta ambició e cobdícia de guanyar indegudament, talen e han tallada fusta en temps indispost e de mala lluna, de hon se segueix dan irreparable, com dita fusta, essent en obra, de continent se podreix, e així los qui aquella han comprat e mes en obra tenen ses persones e de altres a perill, e finalment e fàcilment en poch temps dita obra, per defalliment de dita fusta, se enderroqua. Per proveyr dons a tans dans, perills e despeses, los dits batle e prohòmens han stablit e ordenat que no sia persona alguna de qualsevol ley, stament o condició sia, que gos tallar dita fusta en temps indispost o de mala luna, e qui lo contrari farà, encórregua en pensa de XXX lliures, les quals, sens merçè alguna, seran eixecutades, e si dites XXX lliures, en tot o en part, no podrà pagar, que

en tal cars haja e sia tengut star en la presó tant e tant largament fins que a coneguda de dits batle e prohòmens ne sia deliurat. E, noresmenys, ara puixa pagar dites trenta liures, ara no les puixa pagar, sia bandejat de la present ciutat per a imperpetuum.

Ítem, attés e considerat que molts tallen dita fusta sens licència per a vendre aquella, lo que redunda en gran dan e interès de la dita ciutat e ciutadans de aquella, per ço, han stablit e ordenat que no sia persona alguna qui talle o enderroq fusta alguna qui en manera alguna pusqua vendre ne venedor de fusta, ans qualsevol enderroquador o tallador de fusta sia prohibit de poder vendre fusta. E qui lo contrari farà, encórregua en pena de quinze lliures, les quals, sens merçè, hi seran eixecutades. E si aquelles, en tot o en part, no podia pagar, sia tengut star en presó a coneguda de dits honorables batle e pròmens. E, noresmenys, ara pusqua pagar dita pena, ara no la pusqua pagar, sia bandejat de la present ciutat en temps de deu anys.

Ítem, han stablit e ordenat que qualsevol persona qui talle de dita fusta ab licència, no pusca liurar dita fusta en aquell per qui la haurà tallada, ho altra persona per aquell, sens que no sia present lo guarda o vedaler del Port. E açò a pena de deu liures, de manera dita fusta sia comptada e comprovada ab lo dit albarà o licència.

Ítem, han stablit e ordenat que lo vedaler o guarda de dit Port haja a portar a la fi de quiscun mes los albarans de les licències de la fusta que ab dites licències serà tallada e liurada, persent ell, al notari de la ciutat, sots pena de L sous. E que lo dit notari haja a notar e fer original de dites licències donadores, e li sia donat per quiscun notament e albarà quatre diners, e no u puixa a fer en altra manera.

Ítem, han stablit e ordenat que no sia nengú que gos tallar fusta en lo dit Port sens licència de dits honorable batle e procuradors, així en lo loch vedat com en los amprius || e altres parts del dit Port, e açò per causa dels grans abusos se fan en lo tallar de dita fusta, lo que redunda en gran dan, interès e prejuhi de la cosa pública e universal e en particular, e açò sots pena de X liures e bandegar per a cinch anys. Entés e declarat que los dits honorables batle e prohòmens, als ciutadans e habitants en dita ciutat e sos térmens, tota hora e quant los serà demanada per aquells licència dels amprius per llur propri ús, prestat jurament per aquells que dita fusta voldran per a dit llur propri ús, la hagen a dar e atorgar de continent.

Ítem, han stablit e ordenat que qualsevol bosquerol o altra persona que haja a tallar alguna sort de pins, que no pusqua aquelles deixar e tallar-ne altres, ans haja a pendre e donar aquells pins que una vegada seran per ells tallats, e açò sots pena de X lliures.

E per quant en los presents stabliments ha tres capítols la pena dels quals, ultra la pecuniària, és pena de bandiment, per ço, dit batle e prohòmens volen que la persecució e eixecució de dits

tres capítols en los presents stabliments contenguts sia comesa e remesa als honorables veguer e pahers, ensemps ab lo honorable consell de paheria. Anant emperò en los altres capítols de dits stabliments en los quals tan solament és imposada pena pecuniària, dits batle e procuradors se retenen la persecució e eixecució de aquells.

Volents e ordenants dits batle e prohòmens si les penes pecuniàries en los presents stabliments contengudes sien partides en aquesta manera, ço és, lo terç a l'acusador, e los dos terços sien e s'esguarden al spital de la ciutat de Tortosa, per les necessitats de aquell.

E si dupte o duptes dels presents stabliments insurgiran, dits batle e procuradors se retenen que pusquen dits duptes declarar, decidir e determinar.

E volent los dits honorables batle e prohòmens que los presents stabliments duren per temps de un any après la publicació de aquells.

## 5

1494 marzo 14. Tortosa

*Acuerdo del Consell de Tortosa según el cual se dan poderes a ciertos prohombres para que revisen las ordenanzas establecidas sobre las talas de madera en los bosques de la ciudad.*

ACBEB, Fons de l'Ajuntament de Tortosa, Llibre de Provisions, 65, f. 24r

Sobre la proposició contenent com per causa de cert stabliment fet per la ciutat, prohibitiu en certa manera e ab certes limitacions del tallar de la fusta del Port per los arrendadors de la sublevació de la dita ciutat, és stat donat als honorables procuradors cert protest prenent dit stabliment ésser molt dampnós al dret a ells arrendat de la treta de la fusta, lo qual dret prenen dits arrendadors la ciutat és tenguda fer-los haver e tenir protestant de dans e dampnatges, etcètera. Ffonch per los dits honorables consellers de vintena provehit e delliberat les dites coses ésser comeses e remeses als honorables en Johan Bonet, en Miquel Sans e n'Anthoni Boteller, los quals, ensemps ab los honorables procuradors e micer Cerà, hun assessor, e en loch de micer Terça, qui serveix l'altra assessoria per mort de l'honorable micer Pinyol, qui té participi en lo dit arrendament de la sublevació, entervingua lo honorable micer Pere Savartés, los quals dits mossèn Bonet, en Miquel Sanç e n'Anthoni Boteller, micer Pere Savartés e micer Cerdà, ensemps ab los honorables procuradors, tots o la major part, vejen e reconeguen dits stabliments de dita fusta, e los capítols del dit arrendament de dita sublevació, e si veuran e coneixeran dits stabliments deure pendre alguna limitació, ensemps ab lo magnífich lochtinent de batle, per rembre despeses e dans, hoch

encara conferir de dites coses ab dits arrendadors, a fi fer se porà, plets e differències se relleven bonament, guardant tant com poran lo bé, profit e útil universal de dita ciutat, donants e atorgants los dits prohòmens consellers de vintena a els dites persones eletes per tot plen poder e líbera facultat sobre les dites coses, simil cum incidentibus et deppendentibus.

## 6

1494 mayo 21. Tortosa

*Acuerdo del Consell de Tortosa según el cual se decide que no sean sancionadas las últimas ordenanzas redactadas sobre las talas de madera en los bosques de la ciudad.*

ACBEB, Fons de l'Ajuntament de Tortosa, Llibre de Provisions, 65, f. 32v

Per los quals dits honorables procuradors e prohòmens preinserts, fonch provehit e delliberat que los stabliments fets de la fusta últimament, los quals duren fins a sis de juliol prop venidor, puix lo temps sia passat e sien spirats de aquí avant per ciutat no sien refermats ne hajen força ni valor. E més, fonch provehit que los dits honorables procuradors, per virtut de dits stabliments, no procehixquen a execució neguna.

Ítem més, fonch provehit e delliberat sien fets nous stabliments juxta lo poder a ells donat segons seran ordenats, ab los quals sia provehit a la indemnitat de la ciutat e per aquell no sia fet prejuhí als arrendadors de la sublevació.