The Pisana Chart has been ascribed highly disparate dates since it was discovered by the scientific community in the first half of the 19th century. Over the course of the 20th century, however, the dating of the chart to the end of the 13th century, which I myself had considered valid until now, gradually became customary, although there were never sound reasons for that. As a result of this late 13th century dating, another, closely-related chart —the Cortona Chart— was dated to the early 14th century, and another chart that has recently surfaced —the so-called Lucca Chart— has also been presented as a chart created before 1327. This latter chart, moreover, is even more directly related to the Pisana Chart than the Cortona one because it shares many features with it, from the type of gothic script to a whole series of specific characteristics that they could not have shared by chance, and that reveal their derivation from a common model. The big problem is that the Lucca Chart, though also a product of low technical quality, has a much richer content than the rudimentary Pisana Chart. Upon analyzing it carefully, from its ornamentation to the cartographic design, we discover with surprise that it is full of very late elements. So late that some have never been documented until well into the 15th century. These discoveries force us to modify the traditional dating of the Pisana Chart as well, and to acknowledge that in this case as in so many others, we exaggerated the antiquity of the chart by identifying a rudimentary nature with primitivism.

La carte Pisane a reçu des datations très disparates depuis sa découverte par la communauté scientifique dans la première moitié du XIXᵉ siècle. Au cours du XXᵉ siècle cependant, une datation de la fin du XIIIᵉ siècle — que j'avais moi-même, jusqu'à aujourd'hui, considérée comme valable — s'est progressivement imposée, malgré la faiblesse des arguments en sa faveur. En conséquence de cette première datation de la fin du XIIIᵉ siècle, la carte de Cortone, également non datée, a été estimée du début du XIVᵉ siècle, et la carte récemment découverte à Lucques a été datée d'avant 1327. Cette dernière est davantage en lien avec la carte Pisane que la carte de Cortone, car elle présente plusieurs points communs avec elle, depuis l'écriture gothique jusqu'aux éléments caractéristiques qui ne peuvent être le fait du hasard et qui témoignent d'un modèle commun. Le problème essentiel est que la carte de Lucques, laquelle est également un artefact de qualité médiocre, présente un contenu bien plus riche que la carte Pisane si rudimentaire. Une analyse approfondie de son ornementation et de son contenu révèle de manière surprenante des éléments tardifs, si tardifs que certains n'apparaissent par ailleurs qu'à partir du XVᵉ siècle. Ces découvertes obligent à modifier considérablement la datation traditionnelle de la carte Pisane et à reconnaître que, dans ce cas comme dans beaucoup d'autres, les historiens ont exagéré l'antiquité de la carte en prenant l'aspect rudimentaire du document pour une preuve de primitivisme.

1 This paper is part of the research project financed by the Spanish Ministry of Science and Innovation entitled “La Corona de Aragón en el Mediterráneo bajomedieval. Interculturalidad, mediación, integración y transferencias culturales” (HAR2010-16361; dir. Roser Salicrú).
A long tradition of datings as disparate as they were poorly reasoned.

Since the famous anonymous nautical chart known as the Pisana Chart or Carte Pisane was presented to the scientific community in the mid-19th century by E.-F. Jomard, the stability of its name — derived solely from the fact that it was supposedly purchased from an old Pisan family — has contrasted with the great multiplicity of dates that have been proposed by several authors for this chart, covering a range of about two centuries, from the late 12th to the late 14th. However, when we start to gather and read the literature proposing these various dates, we immediately realize the weakness of the arguments put forth to justify them. Jomard presented it as a 14th-century chart, and this dating was endorsed by the scholar Armand d’Avezac. An experienced palaeographer, d’Avezac, realized that the rudimentary nature of the chart could not hide that « l’écriture (offre) des tendances gothiques inclinant vers la fin du xiv° siècle ». Not a word more, however, was offered by him to justify this statement. This absence of reasoning greatly facilitated Nordenskiöld’s proposal of an alternative date on the sole basis of its coarser cartographic design as compared to those by Pietro Vesconte (especially in the Atlantic area). He asserted that « it is, however, probable that the Carte Pisane was referred with justice to the latter half of the 13th or the first years of the 14th century ».

There were even those who defended a much older dating, ascribing it to the 12th century. The edition of the Compasso de navegare published by Motzo, preceded by a long introductory study, demolished the proposed dating of the chart to before 1256. Motzo pointed out the presence of the toponym Manfredonia on the Pisana Chart. The terminus post quem was thus established as the date of that city’s foundation (1256), but Motzo insisted that it should still be considered as dating from the 13th century. Without providing any justification, he stated that « l’argomento paleografico è invece favorevole a una datazione anteriore di circa un secolo [a reference to the previously mentioned dating proposed by d’Avezac], cioè, la seconda metà del sec. XIII ». As further evidence to support this brief, arbitrary statement, Motzo only added that it contained fewer place-names than other ancient charts, and that it included some toponymic forms also present in the Compasso. The issue of dating the Pisana Chart became even more complicated because Motzo also called into doubt the traditionally accepted idea of the chart’s Genoese origin, considering it more likely (although this was also groundless) to be a Venetian work.

By the 1980s and the publication of Mollat and La Roncière’s Les Portulans in 1984, the dating to ca. 1290 had become quite widespread. The only basis for such a specific dating, however, was an unfounded association between a red cross painted inland in the Syria-Palestine area of the Pisana Chart and the nearby coastal toponym of Acre (conquered by the Muslims in 1291). Shortly after this, Tony Campbell, in his brilliant chapter on medieval portolan charts for the University of Chicago’s The History of Cartography, noted the nature of that absolutely unjustified association, but maintained the dating of the chart to the late 13th century. Given these positions, only Patrick Gautier Dalché, with the insight that characterizes most of his historiographical production, stated that « son aspect grossier, comparé à la qualité des premiers témoins datés, devrait amener à vérifier l’hypothèse selon laquelle il s’agirait plutôt d’une copie maladroite tardive ». It seemed absolutely clear that the chart was not the work of a professional clerk, not only because of the crudeness of its calligraphy, but also because no handwriting professional would have had trouble maintaining the horizontal when writing as the person who copied the Pisana Chart did. I also noticed anomalies in its toponymic content that caught my attention in a chart of such supposed antiquity, as, for instance, the presence of Palamós (on the Catalan coast) and Muggia (written in red on the border between Italy and Slovenia). Palamós indicates a new terminus post quem for both the Pisana Chart and the Compasso de navegare because it was a royal Catalan port founded in 1279 by King Peter II of Aragon in a virtually uninhabited location. Thus, it seems quite natural that it does not appear on any dated chart until 1327.

The inclusion of Muggia caught my attention because it was absent even on the Pizzigano brothers’ dated works and was introduced only at the turn of the 15th century on Venetian charts. Now I have realised that such a late introduction was not accidental, because it coincides with the period in which
the city ceased to be under the authority of the Patriarch of Aquileia to definitively become part of the Venetian dominions. However, I was not aware of this at that time nor of the presence of other late place-names on the Pisana Chart whose history contradicts an ancient dating of this chart. Therefore, although I already held that it was not a professional work, I retained the traditional end of the 13th century for the date of the Pisana Chart, which obviously forced me to date another anonymous, closely-related chart — the Cortona Chart — not much later. However, the emergence of a new discovery — the Lucca Chart (Lucca, AS, Fragmenta codicum, Room 40, Cornice 194/I) — has the force of a major earthquake, and one of which most of our colleagues are still unaware, since the chart was presented as a work predating 1327, according to Philipp Billion’s article in *Imago Mundi* last year. It is obvious that the Pisana and Lucca Charts belong to the same family and were produced in both temporal and geographic proximity to one another. The problem is that, although this was not noted by Billion, the Lucca Chart contains a significant number of elements forcing it to be objectively dated to between the very late 14th-century and the first decades of the 15th. Fortunately, some of these elements are also present on the Pisana Chart, which now offer us strong arguments for questioning its commonly accepted dating, and, by extension, that of the Cortona Chart.

2 Erudite foundations for refuting the traditional datings

Although preceded by a prologue specifying that the work was begun in January of 1296, Motzo wished to stretch the date of the *Compasso de navegare* back to the mid-13th century, and he considered the oldest extant version to be a redraft made in 1296, and the Pisana Chart directly related to that updated portolan*. He based his theory on mere *ex silentio* arguments as deceptive as the presence of Siponto and the absence of Manfredonia in the *Compasso*, in combination with the latter’s presence on the Pisana Chart. Nevertheless, the Cortona Chart, for instance, also bears the toponym Siponto, but not Manfredonia. This is because the Angevins and Guelfs, headed by Charles I of Naples and the popes, long refused to recognize the name of the newly founded imperial city, using the ancient name Siponto to refer to the new city as well. Similarly, the Cortona Chart also includes the toponym Saint-Gilles, labelled in red, whose presence in the *Liber de existencia riuarium* was presented by Gautier Dalché as supposed evidence that the *Liber* was created at the end of the 12th century.

Thus, and given the dangerous mistakes that can be made when relying excessively on elements such as the absence of a toponym or the presence of archaisms (included when a previous tradition had been uncritically perpetuated), it is obvious that it is the introduction of new elements that allows more reliable dating of such works. In this regard, the presence of Gioia Tauro, documented for the first time in 1271, and above all, the presence of the royal Catalan port of Palamós, founded in 1279 in a previously un-inhabited place, demonstrates that neither the *Compasso* nor the Pisana Chart can be dated to earlier than the founding date of the latter town. And the recently published edition of the *Compasso*, philologically annotated in thorough detail by Alessandra Debanne — though it contributes nothing new with respect to the incorrect traditional dating of Hamilton Codex 396— has, however, demonstrated that the text contained in that codex — in my opinion from well into the 14th century — is not written in Tuscan, but rather in the Marchigiano dialect of the Ancona area. In this way, Debanne has unintentionally refuted the majority of the unfounded arguments by Motzo and Conti (1985) on the origins of the earliest extant version of

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9 Pujades, 2007, p. 63 and 489.
10 Billion, 2011.
12 Cortona, Accademia Etrusca, port. 105. High-resolution images on the DVD accompanying my book, *Les cartes portolanes / Portolan Charts*, C2. [Throughout this article the DVD numbers are indicated as follows: charts listed in chronological order preceded by C, and atlases likewise with an A.]
13 This is very clearly explained, for instance by Fra Salimbene da Parma (1221-1289): « [...] in civitate que Manfredonia nominantur; quem civitatem ipse fieri fecit, nomen suum imponens ei. [...] Sed rex Karolus habet eam exosam, in tantum quod eam audire nominari non potest, immo vult, quod appelletur Sipontus Nova ». Palumbo, 1959.
15 The founding charter for the new town was granted on 3 December 1279. Font i Rius, 1969, doc. 335 and p.606.
16 Debanne, 2011. For an accurate criticism of the edition by Debanne see Bocchi 2011. For an alternative dating for the codex Hamilton 396 see Pujades, 2011, p. 267, note 9.1
the Compasso, an assertion that has been confirmed and further developed by Bocchi\textsuperscript{17}. By the same token, if you observe the details of both Giovanni da Carignano’s destroyed Genoese chart and Opicino di Canistris’ spectacular symbolic drawings done between 1334 and 1341 based on the standard Genoese nautical chart model, you will immediately realize that the red cross pâtée has to do neither with Acre nor the Order of Malta, as suggested by Mollat and La Roncière (1984)\textsuperscript{18}. This cross is actually the symbol of the city of Jerusalem, like the one appearing on certain Genoese charts of the second quarter of the 14th century, though painted slightly farther north, as also occurs on the Cortona Chart or the fragment that had belonged to Prince Youssouf Kamal (C23), on which the Jerusalem toponym is also placed at the approximate height of Acre\textsuperscript{19}. Hence, far from being proof of the chart’s great antiquity, we are dealing with a representational convention documented in the second quarter of the 14th century and which must have endured for some time (fig. 1).

Therefore, although I myself had maintained the dating of the Pisana Chart to the late 13th century (following Tony Campbell’s authority in the face of insufficiently founded arguments to contradict such a longstanding tradition), I shall carry out a healthy exercise in self-criticism and demonstrate the reasons why I now consider that Campbell and I were wrong, and that Dr. Gautier Dalché was right when he expressed his doubts with respect to the chart’s antiquity in 2001.

In fact, if the chart had been found today instead of more than 170 years ago, it would hardly have been dated to the end of the 13th century. Although it has a low toponymic density and certain archaic forms and characteristics originating in a reference model of Vescontian roots, it contains many toponyms that cannot be found on dated nautical charts until the end of the 14th or beginning of the 15th century. Tony Campbell has attempted to justify the presence of what he calls « precursor names ». These are understood as place-names appearing on the Pisana and Cortona Charts (the latter dated through its similarity to the first), which seem to disappear for a certain period of time (because they are not present on the two oldest works by Vesconte nor on the Riccardiana chart) to reappear in dated works created somewhat or much later. Their condition as precursors would be justified basically by the presence of some of these toponyms in the two oldest portolans, the Liber de existencia riveriarum, and the Compasso de navigare\textsuperscript{20}. Nevertheless, his reasoning for this is highly questionable, in my opinion. Although they are obviously related products, the process of copying portolans and that of nautical charts had little to do with one another in their logic and techniques. Among other things, the portolan was not limited in toponymic capacity by space, could be remodelled constantly at the copyist’s will because it was not under the corset of a constraining cartographic model, and was not produced in serialised fashion by specialised professionals based on patterns. Therefore, and in contrast to charts, no two portolans are alike, and some place-names that have never been documented on contemporary nautical charts can be found on portolans.

However, apart from the fact that the previous mention of a coastal toponym in a portolan cannot at all prove the date such a toponym was introduced on nautical chart models, there is another highly conspicuous factor. At least a dozen of the toponyms from the list of supposedly precursor place-names on the Pisana and Cortona Charts that are not documented until a good many years later on dated works do not appear either in the Liber de existencia riveriarum or in the Compasso.\textsuperscript{21} Their supposed condition as precursors is therefore based exclusively on the dating of the Pisana and Cortona Charts, which is what I would like to question here in the light of the recent discovery of the Lucca Chart. Nevertheless, the most problematic aspect of Campbell’s list of precursor toponyms, in my opinion, is not this series of place-names of not yet demonstrated antiquity. The major problem is that, by placing the emphasis on

\textsuperscript{17} Bocchi, 2011
\textsuperscript{18} Florence, Archivio di Stato, C. N. 2 (C6); Vatican City, Biblioteca Apostolica Vaticana, Ms. Vat. Lat. 6435, Fol. 61r and 79v. Laharie, M., Le Journal singulier d’Opicinus de Canistris (1337-vers 1341), Vatican City, B. Apostolica Vaticana, 2008, colour plates, figs. 21 and 37.
\textsuperscript{19} The only good reproduction of this fragment can be found in Kamal, 1926-1952, Vol. IV, fasc. 2, 1206-7.
\textsuperscript{20} Campbell, T., http://www.maphistory.info/PrecursorNames.doc
\textsuperscript{21} Montesanto (Vesconte, 1318), La Lista (Vesconte 1321), Quirpastor and Port-Mill (Dulceti, 1330), Lattes and Porto de Sosanto (Dulceti, 1339), Golfo de Latolongo (Cresques Abraham, 1375 ca.), Canet and Chiavari (F. Beccari, 1403), etc.
individuality of each toponym and its date of reappearance, the main underlying issue is blurred on his list. It is the combination of several dozen toponyms introduced on the last Vescontian works but absent from all other Genoese and Majorcan works from the 14th century, with at least another 30 toponyms specific to the Dulcetian-Majorcan model and not appearing on any of the extant Vescontian charts and atlases that represents the real wall against which the traditional dating of the Pisana Chart to the late 13th century crashes. This is the main obstacle, because the hybridisation of both models—the Vescontian model, updated after the cartographers’ move to Venice, and the modernised Majorcan-Dulcetian one (which included the Canary Islands and an improved representation of the northern coasts of Europe, among many other innovations)—is first documented in the Pizzigano brothers’ 1367 chart, as I have had the opportunity to demonstrate recently22, and as I will establish definitively, I hope, in a new monograph that I am presently finishing, which will include the comparative palaeographic edition of the place-names on Vescontian and Dulcetian works.

If we had begun by making a complete, rigorous transcription of the toponyms of all the oldest works preserved, as I am currently doing, we would have realized that the copyist of the Pisana Chart flagrantly tends towards metaphony, that is, he changes the etymological vowel sounds (even the vowels in the masculine and feminine articles), a hyper-characteristic phonetic trait that would be difficult to find in a Pisan or Florentine text and which cannot be found in comparable proportion on any of the extant Genoese, Venetian or Catalan medieval charts either: Ancullo is used for Ancollo, Mansulia for Mansolia, Pusino for Pocim, Baratulu for Baratolo, Castelu for Castello, Falu for Falo, Gega for Gige, izula for isola, Lu Carminu for Lo Carmine and Lu Criu for Lo Crio, tura for tore, Petra de lu Arbito for Petra de l’Arabo, Rapalu for Rapalo, Unin for Onem, Li Scalette for Le Scalette, etc. Its author also tends to retain the initial bilabial before the vowel i (he writes Bianco in contrast to the Ligurian form bianco); he does not confuse laterals with sonorants when followed by fricatives (he writes Amalfi and amalfitano, not Marfi and marfetano like the Genoese), but he lateralises or nasalises the sonorants in other contexts where the Ligurians never do that (he writes Azalcanda instead of Isarcdra and Beruanda instead of Beroardo, for instance). He does not lose the final vowel after a nasal (as the Ligurians normally do) but often omits the final vowel in cases in which it is invariably maintained among the Ligurians (he writes genués instead of zenoese, and scol for scogio); and, eliminating any remaining doubts, he writes viechu/viecha and not veio/veia and Iorgo or Gorgo instead of Giorgio/Zorzo, linguistic traits uncharacteristic of a Ligurian or a Tuscan. This and many other linguistic features that I do not have space to discuss here in the depth I would like, clearly point towards a central or southern Italian dialect. Many of these peculiar linguistic traits uncharacteristic of Tuscans or Ligurians are present on the Lucca Chart as well, which also bears a disproportionate, exclusive representation of a secondary Neapolitan city like Gaeta, offering us a key for deducing that perhaps both works could have been created in the Kingdom of Naples.

And to add still further evidence, the Pisana Chart displays numerous Catalanisms in the Catalan region (Barcelona, Moniusqio, san Felu, Valensia, Marty, Oriola…), as Conti already indicated23; but these Catalanisms, like its amazing Venetianisms, are not just limited to one specific area. The copyist writes, for instance, Corones (instead of Coroni or Colon) on the north-eastern coast of Greece, using a typically Catalan sigmatic plural that stands out flagrantly on an Italian map. If we consider that clear Catalanisms do not appear even on Majorcan works until the mid-14th century (despite the unfounded assertions made by Winter some time ago and immediately refuted by Caraci24), the matter becomes even more problematic because, in contrast, there are no Provençalisms on the southern coast of France and we cannot, therefore, easily justify them as a natural introduction based on native pronunciation, as has been alleged.

In addition to all of this, there is also the problem of a significant number of toponyms not included by Campbell in his list of precursor place-names because they initially seemed exclusive to the Pisana Chart but that we can now also find on the Lucca Chart: Cibo, Rabita, Monte de Gesso and izula d’Exquilo on the North African coast; Li Carale, Porto Calamir, Porto Calferli, Porto Seico, Tagara and Melia on the Asian coast; Porto de li Scalete, Lo Sene, Cauo de Mesene, Castelu, Scauli and Falu on Italy’s Tyrrenhian coast; the above-mentioned Oriola on the southern coast of Valencia; etc.

It is therefore time to discuss the new Lucca Chart, presented by Philipp Billion last year as predating 132725. For its palaeography and the above-stated

24 Lucca, Archivio di Stato, Fragmenta Codicum, Sala 40, Cornice 194/1.
25 1327
3 Erudite foundations for an alternative dating of the Lucca and Pisana Charts

The Lucca Chart’s major contribution to the issue we are analyzing is that, despite the similarities in its palaeography, toponyms and cartography, it is full of elements that are not present on the Pisana Chart and that greatly facilitate the objective dating of the chart. At first sight, it is already obvious that the Lucca Chart follows the archetype for vexillological decoration introduced in nautical cartography through the Vescontian atlases accompanying Sanudo’s Liber secretorum fidelium crucis. The atlases contained therein represent the first known examples of a systematic compilation of heraldic-vexillological motifs in the medieval Mediterranean world, as I have recently explained.

Nevertheless, whereas in the Vescontian atlases created for the Liber secretorum the flags appear alone, on the Lucca Chart the flagpole always emerges from a vignette or schematic representation of the fortified city in question. This practice, which, as stated, does not yet appear on the aforementioned atlases, can be found for the first time on the 1327 Perrino Vesconte chart (C5) which includes city vignettes of the same type and colour scheme as those adorning only certain second-generation Sanudo manuscripts, i.e. those containing the post-1321 expanded version, such as the Bodleian’s Ms. Tanner 190 (f. 175v) or the Vatican’s Reg. Lat. 548 (f. 118r), which do not contain Vescontian nautical atlases. Hence, thanks to the models provided through its contact with Sanudo and his miniaturists, the Vescontian atelier established the ornamental archetype for embellished charts of an intermediate type used for the Lucca Chart, which means that, due to this factor alone, it can hardly be dated to before 1327.

In reality, the elements forcing us to date it much later are already very abundant. Continuing with the vexillology, though in all other cases the Lucca Chart follows the vexillological conventions of the Vescontian models, it no longer displays the banded flag of the Angevin Duchy of Durazzo (extinguished in 1336) over Durrës, which, logically, does appear on the Sanudian atlases and the Perrino chart of 1327. Nor does it bear the flag immediately succeeding it, the flag with an eagle Gules on a field Or corresponding to the Serbian tsar Stefan Dušan (who conquered the city in 1336), and which we invariably find —due to an uncritical tradition— on Catalan charts of the second half of the 14th and the 15th centuries. The Lucca Chart bears a flag over Durazzo that, despite the very poor state of conservation of its coat of arms, indisputably displays a field Gules (i.e. a plain red field). To my vexillological knowledge, such a flag can only correspond to the political changes after the city’s conquest by Karl Topia in 1368, and more probably, to its condition as a Venetian colony as of 1392.

Also extremely conspicuous among these same ornamental components is the presence of an intricate border decorating the graphic scale, which has nothing to do with any of those on extant charts from the 14th century, but which does, in the coarse version by a rather unskilled painter, display exactly the same lacework with black dots that the Maghrebi cartographer al-Tanjí (formerly known as al-Katibi) places, with the expertise of a true professional, on his chart signed in Tunis in year 816 of the Hegira (1413-14 of the Christian Era). As Mónica Herrera demonstrated not long ago, that chart by al-Tanjí is greatly influenced by Christian models from the years immediately preceding it.

But the unequivocally late elements on the Lucca Chart go far beyond its ornamentation, since the chart includes many toponyms introduced later on dated charts. Perhaps the most conspicuous, because of its renown and because it is labelled in red, is the port of Livorno (i.e. Leghorn), introduced in nautical cartography by Francesco Beccari after 1403 in its Ligurian-Occitan form of Ligorna. Livorno does not appear on any extant charts earlier than 1405. Neither does it appear, as a port, in the Liber de existencia riveriarum, nor in the Compasso de Navigare (despite their detailed descriptions of Porto Pisano), nor in either of the two portolans published by Kretschmer. This is

26 Pujades, 2013, p. 139-148.
27 http://bodleian30.bodley.ox.ac.uk:8180/luna/servlet/view/all/what/MS.%20Tanner%20190?os=0&pgs=50
29 It must be stressed that the Liber does mention the fortress of Livorno (“castrum Liburne”), but merely as the feature that tells sailors they have arrived at Porto Pisano, not in the sense of a different port. Gautier Dalché, 1995, lines 1642, 1751, 1753, 1757.
because until the early 15th century, Livorno was, administratively and economically, nothing more than the southernmost infrastructure of the port of Pisa, Porto Pisano, administered by the same officials as the major port complex to which it belonged. However, when Florence took over Pisa in 1406, everything changed radically. From then until 1421, that is, for the following 15 years, Genoa retained control of Livorno. This political circumstance split the major port complex of Porto Pisano into two, controlled by feuding nations. Hence, the Genoese Francesco Beccari, who had not yet labelled Livorno on his 1403 chart (C25), began introducing it on works after 1406, as demonstrated by the copy of one of his later charts in the Cornaro Atlas (Cor1). It was also immediately imported to Venice (not coincidentally, under the same Ligurian form as appeared in Beccari) by the anonymous Master of the Corbitis and Pinelli Atlases (A11, A12).

The fact that that is the most renowned instance, however, does not mean that there are not a great many examples that are just as significant and that only appear at the precise historical moment of the beginning of the 15th century. Mazorbo is first documented in 1339 and Ciuitanova d’Istria in 1367. On the Lucca Chart, on the Italian peninsula’s Adriatic coast, we find the toponyms Torre di Palme and Boccabianca (documented for the first time on the 1373 atlas by the Pizzigano brothers) together with Sant’Andrea (another castle in the present municipality of Cupra Marittima, introduced on the 1330 Duci chart) and Pedaso (first mentioned on the Pinelli and Luxoro atlases). As can be checked on Piero Falchetta’s ‘Periplus Adriaticus’, this group of late place-names only appear together in certain works of Venetian tradition at the beginning of the 15th century. The toponym Numana (immediately to the north of the toponyms mentioned above and exclusive to the Master of the Corbitis and Pinelli Atlases, but also present on the Pisana and Lucca Charts), together with San Benedetto del Tronto (slightly further south), fully confirm the chronology implied by the labelling of Livorno.

Of course, such late toponyms can also be found in other areas of the Lucca Chart beyond Italy. For reasons of time and specialisation, I will focus on the Catalan area because there I cannot only indicate the date of the first documented introduction of each toponym but also the historical reasons why it does not appear on any nautical charts or portolans prior to 1400. I will begin with El Torm, labelled as Torme on the Lucca Chart. Its date of introduction into nautical cartography can be ascertained with great precision because it is not present on the Francesco Beccari chart of 1403, despite its impressively updated toponyms in the Catalan area and other coastal sectors. It is documented for the first time on Gabriel de Vallseca’s 1439 chart. This introduction of the toponym after 1403 is not the result of an arbitrary decision, but rather due to the construction from 1405 to 1411 of a cart road connecting the riverside city of Mora d’Ebre with the coast, through the initiative of the city of Barcelona. This new land route, which likewise served to take merchandise arriving by sea to the Catalan-Aragonese hinterland, transformed the hitherto irrelevant crag located in a completely uninhabited, extremely isolated area into the perfect haven for loading and unloading merchandise coming from or bound for inland towns and cities.

No less compelling is the presence, a bit further south, of the toponym «Porto Alfacco» at the mouth of the Ebro River, substituted for the traditional Porto Fangoso or Port Fangós. Once more, the copy of the Francesco Beccari chart in the Cornaro Atlas is the first to introduce a toponym that does not yet appear on his 1403 chart but reappears in works by his descendant, Battista. That introduction after 1403 was likewise not by chance for the reasons of historically documented geological evolution, which I explained in a previous work to which I refer you for reasons of space. Unfortunately, neither is there space to discuss other toponyms such as Oriola (also present on the Pisana Chart and discussed in the former article) or Badalona. I will just offer one other example, a toponym from the part of Catalonia currently in France, also present on the Pisana Chart, which I have studied recently. If we searched the toponyms throughout the extant medieval production, we would see that Canet de Rosselló (Canet-en-Roussillon) appears neither in the Liber de existencia riveriarum nor in the Compasso de navegare, nor in any 14th-century nautical chart or portolano (except for the Pisana Chart). Once again, it was first introduced by Francesco Beccari, this time on his 1403 chart. In the Archive of the Crown of Aragon is a mag-

31 New Haven: Beinecke Rare Book and Manuscript Library, 1980.158 (image in Pujades, Portolan Charts, C25); and London: British Library, Egerton Ms. 73, ff. 8v-11r (Portolan Charts, COR 1)
significant document containing the proceedings of a judicial trial which explains in detail the reason for such a late introduction\textsuperscript{36}. It describes a dispute between the cities of Cotlliure and Perpignan, because in 1387 the latter had won the suspension of the royal privilege obliging ships to load and unload merchandise only in Cotlliure\textsuperscript{37}. This suspension allowed them, for the first time, to freely use the beach at Canet as a place for loading and unloading in fair weather. Thus began a long litigation process between the two cities that lasted until 1422. What has reached us is the enquiry carried out in 1405-1406, which is full of witness statements describing the lack of nautical and commercial activity at the Canet beach over the course of the 14\textsuperscript{th} century. The statements by the 19 neutral witnesses summoned all agree that until 1344 the officials of the Kings of Majorca (residing in Perpignan) had never allowed any unauthorised commercial activity to take place on that beach, forcing all ships to stop at Cotlliure, where they paid the lleuda —the royal tax on transported merchandise that was a staple for the faltering economy of the impoverished royal house of Majorca. From there, a group of cart drivers with over 400 beasts of burden transported the merchandise between Cotlliure and Perpignan on a daily basis. As of 1344, when the autonomous royal court left the area, this strict control was gradually relaxed and the use of Canet as the illegal merchandise ‘port’ for Perpignan increased until the suspension of the privilege in 1387 made it the regular point of entry and exit for goods coming from or bound for Perpignan. This is why Francesco Beccari introduced the place-name in his toponymic model after his sojourn in Barcelona from 1399 to 1400\textsuperscript{38}.

Having thus located various toponyms specifically pointing to the beginning of the 15\textsuperscript{th} century, some of them exclusive to the Master of the Corbitis and Pinelli Atlases, as, for instance Numana, one need only compare this mapmaker’s cartographic models with the Lucca Chart to find evidence initially much more difficult to perceive, yet absolutely decisive in establishing the late nature of the Lucca Chart and, by extension, of the Pisana Chart. This evidence consists of certain specific errors that are part of the representational conventions of early 15\textsuperscript{th}-century Venetian cartography, particularly in the work of the anonymous Master of the Corbitis and Pinelli Atlases\textsuperscript{39}. Some of them, like the confusion between the Cape of Creus (traditionally labelled in the sea on Majorcan charts) and the port of Cadaqués (confused with a cape because of the pronunciation of the word cape in the Venetian dialect as cao) are quite eloquent in and of themselves. But there are other, much more peculiar errors on the Lucca Chart that refer us directly to the cartographic models of the Master of the Corbitis and Pinelli Atlases. I will focus on an example that can hardly be more significant due to the combination of several changes in a very specific area.

On all extant nautical charts from the 14\textsuperscript{th} century, at the head of the Gulf of Gabès, in modern-day Tunisia, the mouth of a single river (or the river itself) is represented at approximately the same location as the city of Gabès (capisi). Initially, as in so many other cases, only the mouth was represented (C3, C4 and A1 to A3). Vesconte, as in the Sanudian atlases from the 1320s, began to magnify that meagre river (A4 to A8 and C5). At the end of the decade, Carignano continued the process, exaggerating the river’s length even more (C6). The Pizzigano brothers included this already super-magnified representation, which they even coloured blue, in their 1367 chart (C13). It was then handed on to the Beccari (C25) and other, subsequent Italian cartographers, and can also be found on the Lucca Chart. Nevertheless, at the beginning of the 15\textsuperscript{th} century, the author of the Corbitis Atlas made an inadvertent modification to the design that has gone wholly unmentioned: he moved the mouth of the river slightly west (next to the toponym Casar Romol), though it was traditionally represented at Gabès. The Pinelli Atlas, made by the same anonymous cartographer, confirms that this was not an exceptional error but a constant feature of this mapmaker’s production (fig. 6). This error by the Corbitis and Pinelli Master left little trace in subsequent Venetian cartography, because the Vesconte-Pizzigano tradition was stronger. Little, however, does not mean none. Like the author of the Lucca Chart, certain other 15\textsuperscript{th}-century Italian cartmakers, such as the author of the anonymous chart in the Crown of Aragon Archive (MP-1; C50), in the face of the vacillation demonstrated by the two versions circulating in Venice in the early 15\textsuperscript{th} century, decided to represent both river mouths, the « new » one near Casar Romol and the traditional one near Gabès, offering us an extraordinary detail that contributes to a more precise dating of both the Pisana (with just the erroneous mouth at Casar Romol) and the Lucca Charts (with both mouths). In fact, this detail

\textsuperscript{36} Archive of the Crown of Aragon, Cancelleria, Processos en quart, 1405-1406 (407).
\textsuperscript{37} Salicrú i Lluch, 2000.
\textsuperscript{38} Skelton, 1968.
becomes truly decisive if we raise our eyes a bit and observe, very close to it, another representational convention exclusive to the Master of the Corbitis and Pinelli Atlases from among the entire extant late-medieval production.

In all works prior to 1330, there is an area without toponyms between Ras Amabés and the so-called Point of Arzoura or Arzoyara (west of Tripoli, Libya). On his 1330 chart, Dulceti introduced a new toponym in the area, that of Casar Ullo (C7). The Pizzigano brothers added it to their toponymical model, among many other Dulcetian influences, and transmitted it to subsequent Venetian cartographers (C13 and A10). However, the Master of the Corbitis and Pinelli Atlases, confused by the nearby toponym of Palmeri (which was previously misread as « poluere ») modified both toponyms, writing Palmeri de Ullo and Palmeri de l’Azoara. Not content with his erroneous development of the original initial K. of « kaser » and the initial P. of Point as « palmeri », he also decided to emphasize the modifications, placing a series of black dots between the coastline and the beginning of each toponym in a representational convention specific to this author (fig. 6). But, and note the coincidence, we encounter the same representational convention again, in the entire surviving medieval production, only on the Lucca and Pisana Charts, which have been considered to be 100 years older than the Pinelli Atlas. Now, how could such a convention, derived from a peculiar mistake, possibly have jumped the supposed gap of about a century that separates the charts on which it appears (according to the traditional dating of the Pisana) without having left the slightest trace on any of the dated or reliably datable extant works from the 14th century (fig. 7)?

Although perhaps the most important, that is not, of course, the only late representational convention and late corruption that can be found on the Pisana and Lucca Charts. Even more spectacular is the exclusive conventional warning « Guardate, guardate! », copied in the same place, next to the cross identifying some dangerous rocks situated several miles to the west of the Island of Kefalonia on both the Lucca and Pisana Charts (fig. 8). The same is true of the prominence given to secca in the Gulf of Zedico (Khalij Surt), which was never named on any extant 14th-century chart, but which reappears on both the Pisana and Lucca Charts (the latter even adding an explanatory comment), as well as on many 15th-century charts (fig. 9). Neither of these conventions can be found on any extant charts dated or datable to the 14th century. This is because both conventions, though expressed in peculiar, alternative ways, are directly derived from certain changes introduced in earlier representational conventions by the new Beccarian models as of 1401 (C25 and Cor1). This conclusion is wholly confirmed by the presence, again on both the Pisana and Lucca Charts, of the corrupted toponymic form of Monte Colonby (mount of the doves) for Moncolobrer (mount of the snakes), between the Valencian coast and the Balearic islands: a Pizziganian etymological mistake never documented on early charts or portolani, but common among 15th-century Venetian mapmakers.

Conclusion

Therefore, the Pisana and Lucca Charts are not the primitive anonymous works we believed them to be. Research must nonetheless make further inroads to verify this suggestive hypothesis: that, based on an old Venetian model of Vescontian roots also reproduced in a highly simplified manner in eastern-central Italy during the second half of the 14th century (the Cortona Chart provides direct evidence of this), a certain southern artisan with very poor calligraphic and pictorial training, who geometrically simplified the professional designs, attempted, in the 1420s or 30s, to update that already obsolete cartographic model by introducing some innovations supplied by the Venetian cartography of his time. That Venetian cartography, in turn, had already combined the old Vescontian model with the more up-to-date Dulcetian-Vescontian-Beccarian models as of 1401 (C25 and Cor1). This邺

41 Pujades, 2013.
ther to the south in Italy, where these three works of low technical quality — the Pisana, Lucca, and Cortona Charts — seem to have been generated. Among other conventions of their own, it is very important to note that those charts marked sand-banks with black crosses instead of red dots, in contrast to the rest of all extant production made in the three main production centres: Genoa, Venice and Majorca. Such works of low technical quality were, of course, even worse when they were the product of secondary imitation by an even less experienced hand, as clearly occurs in the case of the Pisana Chart. Although we often tend to identify them instinctively, rudimentariness and antiquity are not synonymous, nor is there any reason they should automatically be equated.

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**Identification of the manuscript sources**

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Figure 1: The pattée cross: not related to Acre, but rather the slightly displaced symbol of Jerusalem
(Carignano, Canistris, Cortona, Pisana)

Figure 2: Detail comparison of the Pisana and Lucca Charts (Balearic islands). Note not only the shared deformed outline of Minorca or Cabrera, but also the same misreadings of toponyms, such as “Greperola”, used for “Capraria” or Cabrera
Figure 3: Detail comparison of the Pisana and Lucca Charts (coast of Morocco). Note the highly similar palaeography, the peculiar forms “folco”, “ere”, “bette” (used for Forche, Ellis and Bedis), the same peculiar gap between “ere” and “tarfo noli”, and the design of the central cape and the square island.

Figure 4: The flag of Durazzo on Vesconte’s 1321 (A4) and 1327 (C5) works (Angevin Duchy), and on Soler’s chart (Serbian Empire; C14). On the Lucca Chart, it bears a plain field Gules (red).
Figure 5: Use of the same decorative motif on Al-Tanjï’s 1413-14 (816 of the Hegira) Chart and on the Lucca Chart (painted by an unskilled hand)

Figure 6: From “Palmeri”, “P. de l’Azoara” and “K. Ullo” to “Puluere”, “Palmeri de Ullo” and “Palmeri de l’Azoara”: the misinterpretation of the initials by the master of Corbitis and Pinelli atlases (A-11, A 12) on the base of a new representative convention. Note the groups of black dots representing the palm groves before the word “palmeri” in both name places. Note also the mouth of the river erroneously displaced from Gabés to Casar Romol
Figure 7: DNA corroboration (Tunisian coast). Exclusive mutations of the Corbitis-Pinelli Master incorporated into the Lucca and Pisana Charts: Palmieri de Ullo and Palmieri de l’Asuara both preceded by a group of black dots; a river mouth at Casar Romol (as well as the traditional long river at Gabès on the Lucca Chart). Note also the use of black crosses instead of red dots and the non-realistic conventional form given to the island of Lampedusa on both charts.

Figure 8: Detail comparison of the Pisana and Lucca Charts (Ionian Islands). Note not only the extremely similar, simplified designs, but also the absolutely exclusive conventional warning “Guardate, guardate!” in the same location, in order to emphasize the new beccarian representative convention (big pattée cross; C25)
Figure 9: More DNA corroboration: the new prominence of another secca on the new beccarian pattern. It has remained invariably unnamed until 1403 (Beccari, 1403 still unnamed, C25; 1408 ca. already named Cor1), Pinelli; A12; Lucca and Pisana Charts)