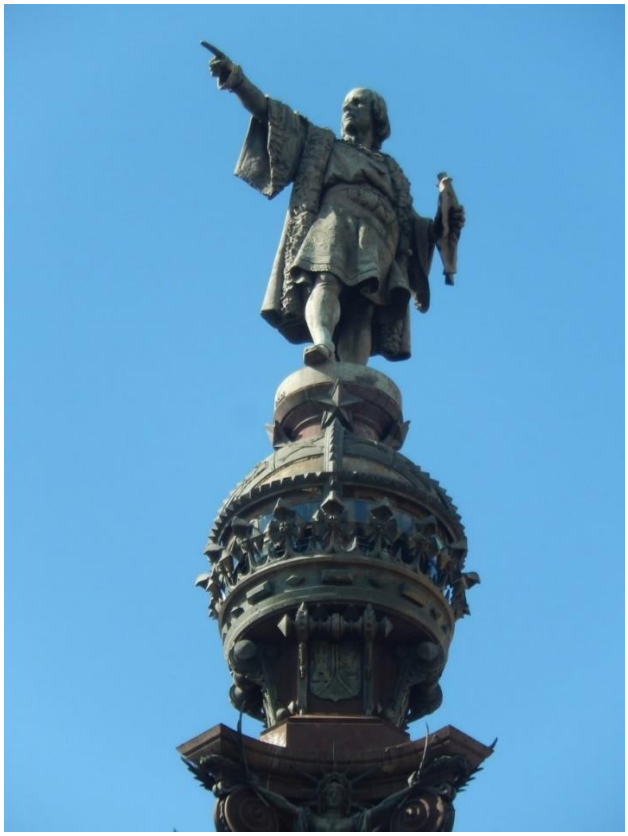
1st Symposium

Columbus and the Discovery of the Americas

Francesc Robusté and Albert Fortuny (Editors)



Barcelona

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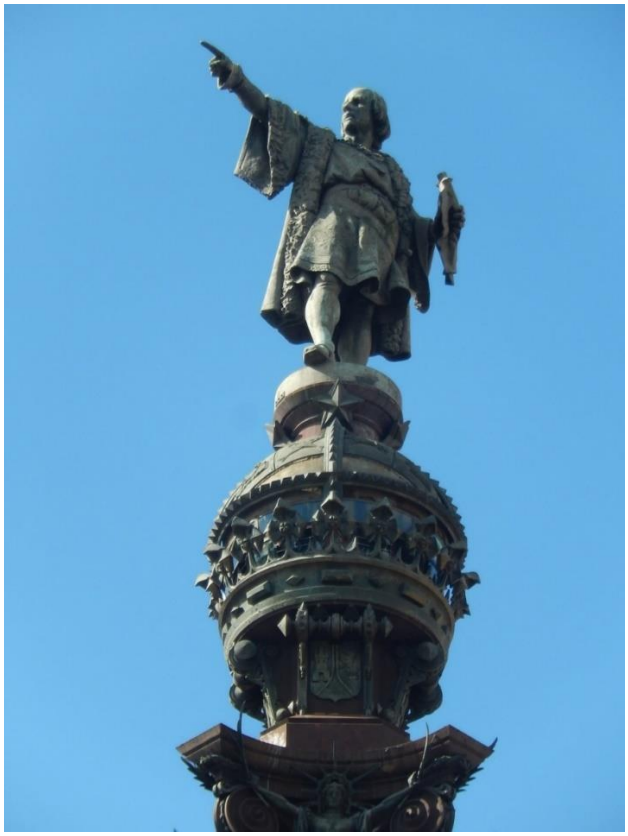

Barcelona, October 15, 2026.

Proceedings of the **1st Symposium on Columbus and the Discovery of the Americas.**

Held in the Prat de la Riba Hall at the *Institut d'Estudis Catalans* (IEC, 47 Carme Street, Barcelona) on Thursday, October 15, 2026. The IEC premises were rented for the event; this does not imply any involvement in the organization or any institutional stance on the part of the IEC (even though one of the speakers is a corresponding member of an IEC section).

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This book contains the papers presented at the *1st Symposium on Columbus and the Discovery of the Americas,* translated into American English, along with a prologue/introduction. In addition to the presentations included in this volume, the symposium featured an explanation of the symbolism of the Columbus Monument in Barcelona (dated from 1888) and a guided tour of the Maritime Museum of Barcelona—housed in the Royal Shipyards of Barcelona—, though the texts of these talks are not included in this book. Four volumes of proceedings have been published, containing the papers translated into Catalan, Spanish, American English (the *lingua franca* of science), and Italian.

Symposium sponsors: Restaurant 700 Milles, La Giralda de l'Arboç, Moventia, SinOb Mobilitat, Rafael Pous, Iddix Grup, CdR, Dofí Jet Boats, Sumus Hotels Group, Hotel Ramblas International, and Accommodation Reservations.

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Symposium Presentation

These proceedings contain the papers presented at the **1st Symposium on Columbus and the Discovery of America**, held on October 15, 2026, at the Institute for Catalan Studies.

We are joined by several top-tier experts and researchers who will present their findings regarding the figure of the Admiral. These presentations will draw from various disciplines—such as genetics, history, cartography, and linguistics—and will be conducted with the utmost scientific rigor.

The objective of this event is, quite simply, to present the **data, research, and evidence** gathered to date. In this way, with all the information laid out before you, **each of you will be able to draw your own conclusions** as to who Columbus really was.

Organizing this symposium has been no easy task. We encountered rejection or a lack of cooperation from various **academic institutions**—in the plural—as well as **maritime organizations** (again, in the plural). We even faced a setback from a shipping company that operates *large, high-speed vessels*; they had initially agreed to cover all the symposium's expenses but withdrew their support few weeks before the event took place.

So, in July and September, we had to reach out to friends' companies for support. We would like to explicitly thank our sponsors: the restaurant "**700 milles**," which hosted our lunch (Joaquim Ullan and Eva Sans, both symposium speakers); **La Giralda de l'Arboç** (Manuel Camino, also a speaker); the mobility operator **Moventia** (Josep Mª Martí); the mobility consultancy **SinOb** (Jordi Singla); **Rafael Pous** (Scientific Committee); **Albert Codinas** (IddiX group of companies); the **Consell de la República** (Montserrat Rossell); **Hotels Sumus** (Ester Buch); **Dofí Jet Boats** (Ramon Sagalés); **Hotel Ramblas Internacional** (Juanon Gaspart); and **Accommodation Reservations** (Pau Bosch).

Despite these obstacles and an initial lack of understanding, our commitment to free inquiry and debate has driven us to move forward with full conviction. We are here to discuss **Science and History**—in the truest sense of the terms. We thank the **Scientific Committee** for their collaboration in the peer review of the presentations: Dr. **Oriol de Fàbregues-Boixar**, Dr. **Josep Ferrer**, Dr. **Antoni Homs**, Dr. **Josep Lluís Larriba**, Dr. **Paolo Pellegrino**, Dr. **Rafael Pous**, Dr. **Francesc Robusté**, and Dr. **Josep Segarra**.

We are aware that 15 minutes per presentation (with the exception of the opening and closing sessions) is very little time, and that there was a **lack of debate, questions, and interaction with the audience**. Let us consider this first symposium as a mere taste of what is to come. That is why we have labeled it the "1st" symposium—because we are convinced that more will need to be organized...

Throughout the day, we have heard presentations that shed light on many unresolved questions. Some, perhaps, have even raised new questions that had not occurred to us before... We began by summarizing some of the mysteries and contradictions within the established historical narrative—points that, for engineers and those with a scientific mindset, inevitably give rise to **doubts** (Albert **Fortuny**).

We examined cutting-edge scientific data through Dr. José Antonio **Lorente**'s studies on Columbus's DNA, complemented by Dr. Lluís **de Yzaguirre**'s revealing analysis of Columbus's writings; Dr. de Yzaguirre is a corresponding member of the Philological Section of the Institute for Catalan Studies (IEC).

In the first session, dedicated to the question of origins, Manuel **Camino** discussed the errors made by Columbus that ultimately led to the discovery. Eva **Sans** demonstrated the existence and historical significance of the port of Pals, while Joaquim **Ullan** addressed the historical authentication of the remains attributed to the Admiral. To conclude this segment, Pep **Mayolas** introduced us to the first printed biography of Columbus.

In the second session, which focused on the discovery of the Americas, Carles **Camp** explored the conditions and the environment that made the discovery and conquest of the Americas possible. Enric **Guillot** highlighted the Catalan imprint found in the iconography of the Americas, and Manel **Capdevila** presented a new theory regarding the navigational methods that Columbus might have employed. Finally, historian Víctor **Cucurull** has placed us within the necessary—and until now overlooked—context of the great Columbian enterprise: Catalonia.

After evaluating all this data—the rigorous study of documents, cartography, linguistic analysis, and the various clues presented today by all these experts—the pieces of the **puzzle** fall into place. *The Catalan Puzzle of the Atlantic*—fittingly, the title of a book being released in just a few days.

The evidence clearly points to the fact that the discovery of the Americas was not merely the achievement of a single man, nor a matter of chance; rather, it was, in all likelihood, a truly Catalan undertaking—in its genesis, its planning, and its execution.

Although we may never possess definitive "proof," the information we have examined leads to the conclusion that any rigorous study today concerning Columbus and the discovery of the Americas during the 15th to 17th centuries must incorporate the **hypothesis that Columbus was Catalan and spoke the Catalan language**.

Francesc Robusté and Albert Fortuny
Barcelona, October 15, 2026

Symposium on Columbus and the Discovery of the Americas: Motivation and Reasonable Doubts

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ABSTRACT

This presentation aims to raise serious doubts regarding the historical account that has been told—and officially accepted—concerning Columbus and the discovery of the Americas.

1. INTRODUCTION AND OBJECTIVES

As an engineer, my work and my way of thinking are based on data analysis. When presented with a project, a blueprint, or—in this case—a historical narrative, I look for internal consistency. The reality is that when one examines the *"official history"* of Columbus through the lens of logic and reason, the narrative falls apart completely.

We are all familiar with the saying that *"history is written by the victors."* But who were the victors in this instance? There are indications that, beginning with the reign of Philip II, a systematic process of historical manipulation was set in motion. The objective was clear: to attribute the entire credit for the Columbian expedition to Castile, while calculatedly erasing the role played by Catalonia.

How do we know—as engineers and as critical-minded citizens—that this history has been manipulated? It is quite simple: the constant emergence of contradictions, geographical anomalies, and inconsistencies renders the account we were taught in school, both technically and humanly impossible.

The purpose of this symposium is, precisely, for the various speakers and experts who will follow me to delve deeper into these studies. My goal today is simply to provide an introduction. I intend to present a series of empirical data—facts, not assumptions—that compel us, at the very least, to question the accuracy of the accepted version.

In the following section, I detail these points of doubt, grouped into several categories.

2. REASONABLE DOUBTS

2.1. The profile of the Genoese "Cristoforo Colombo"

We are told that Columbus corresponds to the figure of a **young Genoese** man who had practically never sailed, and who, furthermore, was too young to possess the organizational capacity required for a naval enterprise of this magnitude.

This Genoese Columbus was a **commoner**; he held no noble title. How is it statistically or protocol-wise possible for him to have addressed King Ferdinand II as an equal—using the informal "you" (*tú*)? In that era, such a thing was unthinkable.

How could this supposed **weaver from Genoa** demand titles such as Admiral, Viceroy, Governor General, and Judge—positions to be held for life and passed on as hereditary? These were offices and honors strictly reserved for members of the high nobility or the royal family.

Finally—and setting aside the scientific evidence regarding DNA and handwriting that will be discussed during this symposium—**the Genoese Colombo always wrote** to his friend Sergio Oderigo and to the *Casa delle compere e dei banchi di San Giorgio* in Genoa **in Spanish**. It was a form of **Spanish riddled with errors** which have been shown (de Yzaguirre, 2026) **to stem from Catalan**, not from the Ligurian language. Incidentally, the house shown in Genoa as the supposed home of Columbus dates from the 18th century, not the 15th...

2.2. The documentary anomaly of the Capitulations of Santa Fe

In the Capitulations of Santa Fe—the contract signed by Columbus with the Catholic Monarchs—it is stated that the titles are granted to Columbus *"for the lands he <u>has discovered</u>."* It is phrased in the **past tense**. We must ask ourselves, logically: had he perhaps already been there before?

If we are told that the discovery was an exclusively Castilian enterprise—carried out solely by Castilians—how can we explain the fact that the foundational contract, **the Capitulacions** (Capitulations), **is kept in the Royal Archive of Barcelona** (known today as the *Archive of the Crown of Aragon,* following a name change under Philip V)? Archival science does not operate by chance.

Technically speaking, “Capitulacions” are a type of contract structured into "chapters" (capítols). This is a purely **Catalan legal model**, not a Castilian one.

We are told that Columbus sought to reach East Asia via a westward route—that he hoped to find Cipango (Japan) and subsequently reach the Asian mainland, specifically Cathay

(China) and the domains of the Great Khan. It was common knowledge that all these places had a ruler or an emperor; so, what logical sense does it make for him to request the title of "Viceroy" or **"Governor" of those lands** for himself? It makes no geopolitical sense—unless he knew for a fact that he was not heading to the Indies, but rather to entirely **new lands.**

2.3. Logistics and Geography (Palos de Huelva vs. Pals de l'Empordà)

The chronicles state that Columbus's ships **passed through the Pillars of Hercules** (the Strait of Gibraltar). Physically speaking, if you set sail from Palos de Huelva (by the way, which Palos? Palos de la Frontera or Palos de Moguer? Oh, wait—Palos de Moguer doesn't even exist!), you are already in the Atlantic Ocean; it makes no sense to **pass through the Strait of Gibraltar**, as you would have already cleared it. If you set sail from the Empordà region, however, you would indeed have to cross it.

The chronicles describe the port of departure as a **walled town**. In Palos de la Frontera, in Huelva, there are no archaeological remains of a wall. In Pals, in the Empordà, there are.

As an engineer, I ask you: how could a maritime expedition of this magnitude be organized in Palos de Huelva—a place that lacked significant nautical infrastructure or the supporting auxiliary industries? In Catalonia, by contrast, the shipyard infrastructure was first-rate.

In Antonio de Herrera's book *"Los hechos de los Castellanos,"* there is an illustration of a town that bears no resemblance to the topography of Palos de la Frontera in Huelva, yet is identical to the terrain and layout of **Pals in the Empordà** (130 km or 1.5h north of Barcelona).

And now, let us consider **travel times**: the chronicles state that Columbus traveled from Seville to Sant Jeroni de la Murtra (in Badalona)—where he was received by the Catholic Monarchs—and that he did so **on foot**. This makes no sense, given that he was accompanied by Indigenous people, exotic animals, and plants—especially when he could have made the journey by sea. Furthermore, the speed of a hypothetical caravan traveling along 15th-century paths—as described in the chronicles—is not plausible. Moreover, there is no documentary record in any of the towns through which it supposedly passed.

The books state that **the sailors were from** *"Palos"* and *"Begër."* If we apply the principles of phonetics and the evolution of place names, the idea that they came from **Pals** and **Begur** makes perfect sense, both geographically and linguistically.

2.4. The Death of Columbus

Chronicles state that Columbus died on May 20, 1506, at the *Convento de San Francisco* (Convent of Saint Francis) in Valladolid. The site currently occupied by the *Military Government*—at the end of La Rambla in Barcelona, extending toward the Duc de

Medinaceli square—was, until 1835, the location of the **Convent of Saint Francis** (also known as the **Convent of the Framenors**). It was burned down during the *Bullanga* (civil unrest) in Barcelona and subsequently demolished between 1836 and 1837, following the *Desamortización* (ecclesiastical property confiscation) of Mendizábal. It is said that Columbus wished to die wearing the habit of a Franciscan friar.

There is a document in the Barcelona Cathedral that refers to Columbus's tomb. This raises another question: was he actually buried in Barcelona before his various official reinterments—in Seville, Santo Domingo, Havana, back to Santo Domingo, and finally back to Seville?

2.5. Statistics of the Second Voyage

We are told that no Catalans were involved in the discovery. Yet, how is it that on the second voyage—which is said to have departed from Cádiz, at a time when the infrastructure needed to be consolidated—so many Catalans were present in key positions?

This includes 12 friars from Montserrat led by Bernat Boïl, the friar Ramón Pané from Sant Jeroni de la Murtra, and the presence of Pere Bertran Margarit and Miquel de Ballester in military roles.

Recently, the official historical narrative has acknowledged that the expedition **departed from Barcelona**—one doubt resolved, but many more remain. Clarifying these questions—in one direction or another—is the very spirit of this Symposium.

3. CONCLUSIONS

My sole intention has been to lay these facts on the table. There are too many inconsistencies for them to be the result of mere chance; rather, they appear to be the product of censorship and a poorly executed adaptation.

The individuals who will present their papers shortly have dedicated a significant portion of their lives to investigating and addressing some of these anomalies.

It is my hope that the presentations delivered at this symposium will shed some light on uncovering the true history of Columbus and the discovery of the Americas.

Perhaps with a touch of over-optimism, we have designated this as the *"First"* symposium—fully aware that resolving these questions will require future symposia, perhaps focusing on specific aspects of Columbus and the discovery of the Americas.

By combining analysis and knowledge, engaging in reflection, and keeping an open mind toward new explanations—guided solely by evidence or **data, logic, and the scientific method—we can finally bring the truth to light.**

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Studies on Columbus's DNA

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ABSTRACT
Between 2003 and 2024, a complex research project was carried out, involving more than 70 scientists and professionals from 14 universities and research centers across 7 different countries.

The objective was to use genetic (DNA) analysis to provide historians and experts on Columbus with information regarding two major questions surrounding his figure: one concerning his origins, and the other regarding the final resting place of his mortal remains.

Current data (currently in the final stages of scientific publication) confirm that the remains located in Seville belong to the explorer (it was not possible to study the remains in the Dominican Republic, which could also potentially be his).

Regarding his origins, none of the samples from potential relatives—compared directly via Y-chromosome analysis—matched those of the Columbus family. Population data point most strongly to the Western Mediterranean; this information should serve as an objective reference to assist historians and scholars in refining hypotheses regarding the origins of the Admiral and the explorer.

1. INTRODUCTION TO THE MYSTERIES SURROUNDING THE EXPLORER

For more than five hundred years, two mysteries have surrounded the figure of Christopher Columbus (hereinafter, CC). The first and most universal issue concerns his tomb, as there are officially two places that claim to house the remains of the great navigator: Seville—specifically its Cathedral—and Santo Domingo in the Dominican Republic, within the impressive monument known as the *Faro de las Américas* (Lighthouse of the Americas).

The reason why Christopher Columbus's remains might be in two different locations stems from the twists and turns of history—a subject well documented in texts and chronicles from various periods. Between Columbus's death in Valladolid on May 20, 1506, and the final interment of his remains in the Seville Cathedral in 1899, they were moved several times. In 1509, they left Valladolid and were taken to Seville (to the *Isla de la Cartuja*); from there, they were moved to the Cathedral of Santo Domingo in the Dominican Republic, and subsequently to the Cathedral of Havana in Cuba, arriving in 1796. Finally, in 1899—

following the loss of Cuba, the last of Spain's overseas territories (along with the Philippines and Puerto Rico)—the remains were brought back to the Iberian Peninsula and placed in their current location in Seville. Thus, as we have seen, his body has been in Seville on two separate occasions, albeit in different locations.

As previously mentioned, the relocations of the remains are based on solid historical reasons and are well-documented. The dispute over the true location of Columbus's bones dates back to 1877; at that time, they were believed to be in Havana, but during construction work at the Cathedral of Santo Domingo, a container was discovered bearing the name "Christopher Columbus." Based on this evidence, the Dominican authorities of the time concluded that the bones had never been moved to Havana in 1796—contrary to the claims of the Spanish authorities of the era, who maintained that Columbus's remains had indeed been taken to Cuba.

It should be noted that neither the container in Santo Domingo nor the one in Seville holds a complete human skeleton. Is it possible that the remains were divided in 1796, with part of the body staying in Santo Domingo while the rest ended up in Seville—having first been sent to Havana?

Perhaps. In fact, both in 2003 and subsequently, our team from the University of Granada requested permission from the Dominican authorities to study the remains they hold, but to date, we have never received final authorization.

The second mystery surrounding Columbus—less significant in the 21st century, yet still of interest to historians and experts on Columbus—concerns his origins. The most widely held and generally accepted theory regarding his origin places his birth in Genoa, Italy, within a humble family living near the port of this beautiful, seafaring city.

It was against this backdrop that, in 2001—at the suggestion of history professor Marcial Castro—we embarked on a complex and challenging research project, which has recently yielded results that help clarify the aforementioned aspects.

The first operational phase of the project, aimed at identifying the final resting place of Columbus's remains, was carried out in June 2003. A key milestone during this phase was gaining access to the remains of Christopher Columbus and his son, Hernando—both of whom are interred in different locations within the Cathedral of Seville (the Holy, Metropolitan, and Patriarchal Cathedral Church of Saint Mary of the See and the Assumption).

The most significant remains for establishing a direct comparison are those of his son Ferran (Hernando), as they are the only ones—among all known relatives—whose identity is beyond doubt. As his son, Hernando shares half of his chromosomes (autosomes 1 through 22) with CC, and his Y chromosome is likewise identical. Based on this, secure and reliable comparisons could be made.

The results obtained in our study indicate a first-degree biological relationship between the remains of Christopher Columbus in Seville and those of his son, Hernando. This type of relationship exists between a parent and a child (or a child and a parent, in terms of ancestry).

Given that Hernando Columbus had no children, and his brother Jaume (Diego) was born to a different mother, the only possible first-degree relative is his father. This allows for the identification of the remains in Seville as those of Christopher Columbus; furthermore, the Y-chromosome and mitochondrial DNA data from Ferran (Hernando) provide information that historians can use in their interpretations.

2. THE ADMIRAL'S ORIGINS

Between 2003 and 2021, many experts approached us at the University of Granada, each advocating for different theories regarding the origins of CC. Depending on the feasibility of conducting direct comparative studies—what we might term "direct, non-individualizing comparison"—we can categorize these theories into the two groups outlined below.

One group of theories—which we refer to as "specific" or "concrete"—relies on skeletal remains of potential relatives of Columbus, whose DNA could be analyzed via the "Y chromosome." This group includes two theories positing a **Portuguese** origin, one suggesting a **Galician** origin, and another proposing a **Majorcan** origin—specifically identifying the Prince of Viana as Columbus's father, with a woman from Felanitx, Majorca, named Margalida Colom, as his mother.

Upon comparing the Y-chromosome data, **no matches were found in any of the cases**. As geneticists, we cannot definitively state that these theories are false; however, the Y-chromosome DNA of the Colom family did not match the DNA of the individuals with whom it *should* have aligned, according to the genealogical trees that ostensibly establish these relationships.

What we can assert is that, if the intention was to use DNA to substantiate or prove any of these specific theories, **that objective has not been met**.

This could mean that the theory itself is incorrect. Alternatively, it is possible that the remains—for instance, those of a great-uncle of Columbus intended for comparison—do not actually belong to that individual, or that an instance of infidelity occurred, meaning the subject does not carry the family's Y chromosome.

The alternative is that, once the data have been published, those interested in continuing to uphold and support these various theories may conduct analyses and make the appropriate comparisons to see whether, at any point, there is a coincidence with sufficient statistical significance to confirm a biological family relationship.

The other group of theories—which we term "nonspecific" or "open"—provide solid historical data, yet these data remain generic from a genetic perspective. This category includes the classic theory of a **Genoese-Italian** origin; the theory of a **Catalan** or **Valencian** origin with Jewish ancestry; the theory—to a certain extent—of an **Agot** origin; and various others (such as a **Norwegian** or **Polish** origin, which we did not consider in our study).

For example, the Genoese theory offers no genetic evidence beyond the claim that he was born in Genoa. It should be noted that, in northern Italy at the time, "Colombo" was a very common surname; it was frequently assigned to children of unknown parentage—those left in orphanages or abandoned on the streets. This significantly complicates the study of Y-chromosome DNA, even within contemporary populations.

As one might expect, there is great variability in the Y-chromosome DNA of individuals living today who bear the surname "Colombo." Because these individuals come from such diverse backgrounds, the "Colombo" name effectively masks the DNA of people whose ancestors actually held very different surnames. It is far easier to conduct a study on individuals with rare surnames—where Y-chromosome DNA tends to be more homogeneous—than it is to study common surnames, or names like "Colombo" (or "Expósito," as seen in earlier periods of Spanish history) that stem from highly varied origins. Depending on the databases used for comparison and the interpretation provided by historians, **the notion of a Spanish Mediterranean Columbus—possessing certain characteristics consistent with those described in Jewish populations—is plausible.**

However, genetics cannot offer further insights or provide additional objective data—as we noted at the beginning of this text—due to inherent limitations that are already well understood. Columbus could have been born anywhere; yet, an individual's DNA is ultimately derived from their parents—specifically, in the case of the Y-chromosome, from the father. Therefore, if his parents were in a location at the time of his birth where that particular Y-chromosome haplotype or haplogroup is common, the genetic data would point to the correct place. Conversely, if his parents were elsewhere, the DNA could lead to some confusion.

3. CONCLUSIONS

The findings of our study—to date—confirm that **the remains held in Seville belong to Christopher Columbus**. They provide highly significant information regarding the DNA of his family; furthermore, we have successfully recovered a portion of the Y-chromosome DNA belonging to the prominent Spanish royal house of **Trastámara**. All of this information is now freely available for comparison by experts and historians interested in this period of Spanish history.

And, as always, history continues; we all remain part of the history of our own lives, which in turn forms part of the history of our peoples and nations. Human beings will always seek to know more—more data, more details—striving for fewer uncertainties and fewer doubts. greater accuracy and greater precision—though science will never be able to capture, years later, the feelings and sensations (the fears and hopes) experienced by the various characters as they made decisions and undertook feats that changed history.

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RTVE Documentary: *"Columbus DNA: His True Origin"*

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ABSTRACT

This presentation serves merely as a summary of the RTVE documentary *"Columbus DNA: His True Origin"* (in Spanish). It acts as an annex to the preceding presentation by Dr. José Antonio Lorente and was not, in fact, presented at the Symposium.

1. INTRODUCTION AND OBJECTIVES

On October 12, 2024, following significant media coverage, RTVE premiered the documentary "**Columbus DNA: His True Origin**." The documentary was directed by Regis Francisco López, who also wrote the script. It summarizes the work carried out by the team led by Dr. José Antonio Lorente, Professor of Legal and Forensic Medicine at the University of Granada.

The documentary (in Spanish) has a runtime of 1 hour and 46 minutes; it is publicly available and can be accessed via the following link:

https://www.rtve.es/play/videos/somos-cine/colon-adn-verdadero-origen/16281015/



Fig. 1. *Opening header of the RTVE Columbus DNA documentary.*

As Dr. Lorente's scientific article had not yet been published by the date of this *1st Symposium on Columbus and the Discovery of the Americas* (Barcelona, October 15, 2026)—and given that the team has signed confidentiality agreements regarding the paper, which is currently under peer review—this paper merely describes and analyzes the documentary, without providing any technical information beyond what is disclosed therein.

Any analysis must be approached with the caveat that the specific details of the data and the examinations of the skeletal remains—which Dr. Lorente's team has been studying for two decades—are not available. Therefore, we will limit ourselves to describing the content of the documentary and quoting verbatim statements made within it. From now on, we will refer to Christopher Columbus using the acronym "CC."

2. EPISODE 1 – THE ORIGIN

We are all familiar with the established narrative: that Columbus was born in Genoa into a humble family. *"I thought I knew the story well, but I was mistaken... there are 'blacked-out' sequences that were always linked to his true origin."*

Columbus *"is attributed more than 25 different origins or identities."* The documentary ultimately selects several hypotheses for comparison, including the Galician, Portuguese (Pedro Ataide), Castilian, Jewish, Basque-Navarrese (Agot), and Majorcan (son of the Prince of Viana) theories—as well as, naturally, the Genoese theory, which is the traditionally accepted origin.

The documentary also mentions the remains attributed to Christopher Columbus that are kept in the Cathedral of Santo Domingo. However, the Dominican Republic government has never authorized the exhumation of these remains for analysis and comparison.

Cristóbal Colón de Carvajal, Duke of Veragua, is a direct descendant of Christopher Columbus; however, at a certain point, the genealogy ceases to follow a strictly male line, which precludes a direct comparison of Columbus's Y chromosome.



Fig. 2. *Dr. Lorente and the damaged remains of "brother" Diego Columbus.*

The remains attributed to Diego Columbus, traditionally considered CC's brother, were located in the former Charterhouse of Seville (La Cartuja). His remains were placed inside a metal box used as a step stool to reach the upper archives. Later, the box was buried. Upon opening it, it was found filled with water and containing very small bone fragments (Fig. 2). DNA analyses proved that these bones were not those of Columbus's brother, but rather of a fifth- or sixth-degree relative.

On the other hand, the documentary presents the identity of the remains of CC's second son, **Hernando Columbus**, as well established.



Fig. 3. *Well-preserved remains of the son Hernando Columbus.*

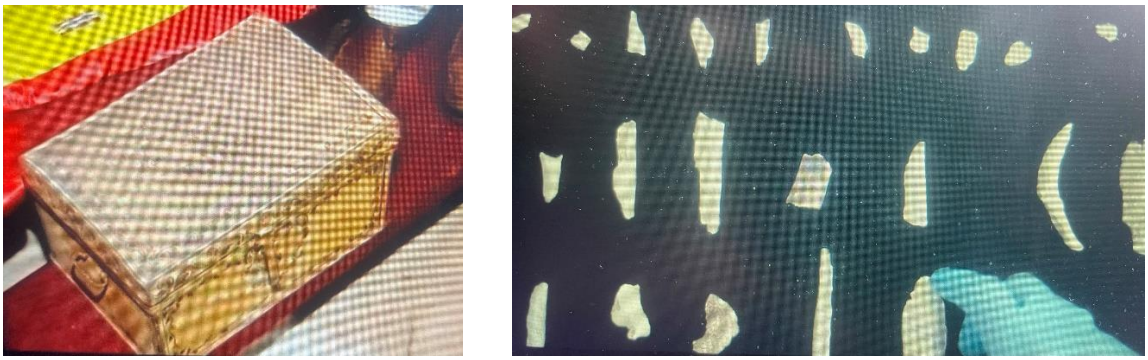

Fig. 4. *Remains of Columbus preserved in the Cathedral of Seville.*

3. EPISODE 2 – THE VOYAGE

Cristóbal Colón de Carvajal, Duke of Veragua, describes the official history. The documentary shows that, alongside the bones of Hernando Columbus, several extraneous items were found, such as a lead shot, some seeds, and gold and silver threads that could have come from clothing or the shrouds in which the remains were wrapped.

One of the points presented as controversial regarding CC's Genoese origin is the language of his surviving writings (in addition to CC's humble origins). The documentary highlights that no writings of his are known in Ligurian (Genoese Italian), and that, conversely,

surviving letters addressed to Genoese correspondents are written in Spanish.

Among these are those letters addressed to the Banco di San Giorgio in Genoa. This bank was the *Casa delle compere e dei banchi di San Giorgio* (in Latin, *Officium comperarum et bancorum Sancti Georgii*, commonly and historically known as the *Banco di San Giorgio* or *Ufficio di San Giorgio*).



Fig. 5. *Supposed house of Columbus in Genoa.*

Surviving letters from Christopher Columbus addressed to the *Protectori* (the protectors or administrators) of the Banco di San Giorgio in Genoa **are written in Spanish**. One of the best-known examples is the letter written by Columbus from Seville on April 2, 1502, shortly before embarking on his fourth voyage.

The documentary likewise mentions several theories proposing **different origins for Columbus within the Italian peninsula**. All these doubts and inconsistencies, together with the absence of a contemporary portrait of a figure of CC's stature, lead the documentary's screenwriter to state that *«we have been told stories that are not true, and the true stories have been hidden.»*

4. KEY CONTRIBUTIONS OF THE DOCUMENTARY

Here we cite some key contributions of the documentary, indicating the minutes and seconds in which they appear.

00:44:39–00:44:47.
Lorente states that the team has clearly demonstrated the **father-son relationship** between the bones attributed to Christopher Columbus and Hernando Columbus.

00:45:06–00:45:23.
Based on this relationship, he concludes that the bones preserved in Seville and attributed to CC indeed correspond to Christopher Columbus.

00:45:35–00:45:49.
He explains that this provides genetic information on the paternal line of the Admiral's family and allows for subsequent comparisons.

00:48:23–00:48:57.
He declares that the remains attributed to **Diego Columbus do not correspond to a biological brother of Christopher**, but could correspond to a relative approximately in the fifth or sixth degree.

00:55:52–00:56:10.
He reports that the DNA of Aldonza de Mendoza does not match that of the Columbus family; thus, according to the comparison presented, **the specific Castilian identity of Rodrigo de Mendoza is ruled out.**

01:04:58–01:05:12.
He indicates that **the Portuguese samples examined do not match the Columbus family.**

01:05:29–01:05:54.
He specifically shows that the Y chromosome of Antonio Ataide differs from that of Columbus; according to the genealogy used for comparison, this **rules out the identification of Columbus with Pedro Ataide.**

01:15:48–01:16:19.
He communicates that the DNA of the Columbus family does not match that of the Sotomayor family; this comparison **rules out,** according to the documentary, **the Galician theory** as formulated (i.e., Columbus = Pedro Madruga/Sotomayor).

01:24:15–01:24:38.
He explains that the Y chromosome of the Agots analyzed differs from that of the Columbus family; therefore, these samples **do not support the hypothesis that Columbus was an Agot.**

01:24:38–01:24:46.
He adds that HLA-B27 does not appear either, a fact presented by the documentary as an additional argument **against the Basque-Navarrese hypothesis**.

01:30:54–01:31:23.
He declares that the DNA of the Columbus family does not match the Trastámara line represented by Don Tello and John II of Castile; according to the comparison presented, **the paternity of the Prince of Viana is ruled out.**

01:34:41–01:35:08.
He summarizes that all specific genealogical identities examined, of the type «son of a specific person», have been **ruled out**, and tells Francesc Albardaner✞ that his hypothesis is the one that comes closest.

01:35:47–01:35:57.
«Both in the Y chromosome and in the mitochondrial DNA of Hernando there are traits compatible with **Jewish origin**.» It is important to emphasize the wording used: it speaks of traits "compatible" with a Jewish origin, not an exclusive or unequivocal genetic identification of that origin.

01:36:17–01:36:23.
The general geographic location proposed by Lorente is: *«**Western Mediterranean.**»*

01:40:56–01:41:07.
He tells Francesc Albardaner✞ that his proposal or hypothesis from twenty years earlier matches the results and that there is a "**convergence**."

01:41:09–01:41:57.
The documentary concludes that the most probable origin would be **the Spanish Mediterranean arc or the Balearic Islands**. The Italian peninsula and Sicily are considered less probable based not only on the genetic results presented, but also on demographic and linguistic arguments.

5. CONCLUSIONS

The documentary *«Colón ADN. Su verdadero origen»* (*"Columbus DNA: His True Origin,"* in Spanish, broadcasted on October 12, 2024 by the Spanish public TV, RTVE) provides, above all, a body of genetic results that allow for the exclusion of several specific hypotheses regarding Christopher Columbus's identity, assuming the identification of Hernando Columbus's remains and, based on the genetically proven father-son relationship, the attribution of the other remains preserved in Seville to Christopher Columbus. However, these results do not yet make it possible to unequivocally establish an exact place of birth.

The primary basis is historical and archaeological. Hernando died in Seville on July 12, 1539; the record of the opening of his will on that same day is preserved, and historical documentation indicates that his executors buried him, according to his wishes, in Seville Cathedral.

First, the most important result is likely the confirmation of the father-son relationship between the remains attributed to Christopher Columbus and those of Hernando Columbus. This concordance forms the basis upon which the documentary identifies the remains preserved in Seville as those of the Admiral and establishes a reference family genetic profile.

Second, the study yields particularly robust results regarding the exclusion of the specific identities examined. Genetic comparisons presented in the documentary rule out specific identifications of Columbus with Rodrigo de Mendoza, Pedro Ataide, and Pedro Madruga/Sotomayor, as well as the paternity attributed to the Prince of Viana. Likewise, analyzed Y chromosomes do not link the Columbus family to the Agots studied.

It is also particularly relevant that the remains traditionally attributed to Diego Columbus do not, according to the documentary, correspond to a biological brother of Christopher Columbus. This observation forces a review of any genealogical reconstruction that uses

these remains as a direct representation of the family's paternal line.

Once these individual identities are ruled out, the documentary shifts from a search based on specific genealogies to an inference about population origin. Lorente states that both the Y chromosome and mitochondrial DNA observed in Hernando present traits compatible with a Jewish origin and places the general geographic origin in the *«Western Mediterranean.»*

This is likely the most significant conceptual shift introduced by the documentary: the results do not identify a specific historical person or family as Columbus's origin, but they narrow down the space of hypotheses compatible with the presented data.



Fig. 6. *José Antonio Lorente and Francesc Albardaner✞.*

Finally, the documentary notes a convergence between these results and the hypothesis advocated by Francesc Albardaner✞, placing the preferred scenario in the **Mediterranean arc of the Iberian Peninsula or the Balearic Islands (the former Crown of Aragon)**. However, this latter delimitation does not derive exclusively from DNA: the documentary itself incorporates demographic and linguistic arguments to consider the Italian peninsula and Sicily less probable.

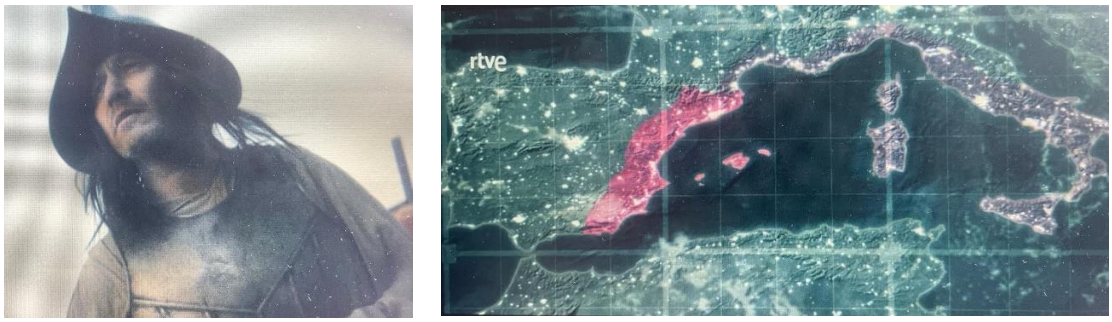

Fig. 7. *Mediterranean Arc of the Iberian Peninsula, probable origin of Columbus.*

Therefore, based exclusively on what has been made public in the documentary, it cannot be scientifically asserted that Columbus was Catalan, Valencian, Majorcan, Genoese, or native to any other specific territory. What can indeed be affirmed is that the presented results substantially restrict the set of examined hypotheses and direct the investigation toward a

Western Mediterranean population with genetic traits that Lorente considers compatible with a **Jewish origin**. This factor further **rules out a relationship with Genoa** according to Francesc Albardaner✞, as **Jews were expelled from Genoa in the 12th century** (1134) **and barred from permanent settlement.**

Negative results—genetic incompatibilities with specific families or individuals—are far more specific than positive identification of geographic origin. The publication of genetic data, studied markers, obtained sequences, reference populations, and statistical procedures will therefore be essential to determine the extent to which Christopher Columbus's origin can be narrowed down beyond the Western Mediterranean.

REFERENCE

RTVE (2024) *Colón ADN. Su verdadero origen.* "Columbus DNA: His True Origin," in Spanish, broadcasted on October 12, 2024 by the Spanish public TV (RTVE). The same TV chain broadcasted the documentary a second time on October 9, 2026. https://www.rtve.es/play/videos/somos-cine/colon-adn-verdadero-origen/16281015/.

NOTE

The RTVE documentary *Colón ADN. Su verdadero origen* ("Columbus DNA: His True Origin," in Spanish, broadcasted on October 12, 2024 by the Spanish public TV, RTVE, and broadcated for the second time on October 9, 2026), does not allow to take screenshots from the video to illustrate the presentation. While there must be (likely) a way to bypass this restriction, we opted for a pragmatic and efficient approach: taking photos of a large screen using a mobile phone, then cropping them and including them as figures. Naturally, the quality of these images is poor, but they serve to provide at least some visual illustration for the text. Anyone wishing for better images—or wanting to follow the documentary's full line of reasoning—should set aside one hour and forty-six minutes to watch and listen to it.

The DNA of Columbus's Writings

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ABSTRACT

With this paper, I aim to gather the conclusions that several works scattered over time and in various publication sources have allowed me to obtain regarding the clues that Christopher Columbus's Spanish writings can provide about his native language. This compilation should also serve to present the lexicometric methodology used and to suggest improvements in the transcriptions upon which it was based.

1. INTRODUCTION AND OBJECTIVES

The following pages aspire to offer scholars of the Columbian hypotheses a revised version of previous works, most of which only exist in audiovisual or presentation formats (.ppt). They also aim to provide tools to evaluate the methodology employed or even to verify or falsify my findings. Thus, I will place my contributions within a twenty-five-year trajectory, summarize the results, provide keys to understanding the process of obtaining these results, and suggest ways to further delve into them.

2. BACKGROUND

At the end of the 20th century, Discovery Channel (DC), a cable television channel owned by Warner Bros., promoted a dramatized documentary on the origin of Christopher Columbus that incorporated DNA studies of bones allegedly belonging to Columbus, preserved in controversial locations. When the promised results did not arrive at the usual pace expected in the production of this type of content, the company acting as DC's intermediary in Spain (the production company *Tráfico de Ideas)* sought to complement the effort and became interested in Columbus's writings, from both a paleographic and a strictly philological perspective. In this context, *Tráfico de Ideas* contacted the Centre d'Estudis Colombins of Òmnium Cultural, chaired by Joaquim Arenas✞ with Francesc Albardaner✞ as vice-president. They took charge of involving Dr. Gabriel Roura from the University of Girona to conduct the paleographic study, while asking me whether I could contribute something satisfying the production company's requirement of applying modern methods to

ancient enigmas—which was the leitmotif of the series hosting the docudrama—in order to throw light on Columbus's origin based on his writings.

Reading previous works supporting a Catalan hypothesis led me to observe that they were mostly based on observations regarding the use of words, toponyms, or syntactic constructions allegedly Catalan, and that no one had explored phonological aspects.

Thus, I started from the unquestioned academic axiom that **Spanish was not Columbus's native language** (L1) and raised the hypothesis that a lexicometric analysis of the peculiarities of the Spanish in Columbus's writings (conceived as interferences from his L1, his mother language) could provide clues regarding his native language. This entire approach is developed in De Yzaguirre (2006a). I have metaphorically titled this paper *"The DNA of Columbus's Writings"* in line with the fact that what motivated the request for our philological study was precisely that the results on biological DNA were not progressing as swiftly as desired.

3. ACHIEVEMENTS

The study proposed to me for DC was to be conducted on the transcription published by Dr. Varela (Varela 1982), comprising a set of documents ranging from January 4, 1493, to February 5, 1505—a period of more than ten years in which any L2 learner is highly likely to display an evolution from error to accuracy, often passing through a stage of hypercorrections (such as when saying *javia* for *hi havia*).

The dissemination of the results through a docudrama left many scholars lacking technical details, and in subsequent years I was requested on several occasions to pause my ongoing research to revisit the Columbian topic and disseminate its findings. Only in one case can we speak of a publication following academic standards; the rest of the accessible materials consist of presentation slides.

Below I will review several relevant aspects, starting with the root of the matter—the DC docudrama—basing my discussion on my own works where the reader can find full details: De Yzaguirre (2006a, 2006b, 2006c, and 2019). Their references are:

- COLUMBUS, Secrets from the Grave, https://www.imdb.com/title/tt0893320/.
- De Yzaguirre, Lluís (2006a): Aproximació lexicomètrica a les interferències de base fonològica en els escrits autògrafs de Cristòfor Colom, in Consell interinsular d'Eivissa i Formentera, "La lengua materna de Cristóbal Colón" (The mother tongue of Columbus), Eivissa, 2006, Legal Deposit I-283-2006 (appendices 1, 2, 3).
- De Yzaguirre, Lluís (2006b): De **V**arcelona a Se**b**illa amb Cristòfor Colom, slides from the lecture given at the commemoration of the 500th anniversary of the death of Christopher Columbus, Barcelona, May 20, 2006, organized by the Centre d'Estudis Colombins (appendix 1).

- De Yzaguirre, Lluís (2006c): Badava Colom?, slides from the lecture organized by the Rotary Club of Barcelona at CosmoCaixa Barcelona, June 27, 2006, organized with the Centre d'Estudis Colombins.
- De Yzaguirre, Lluís (2019): Materials from the lecture presented at the Ateneu Barcelonès, 2019, organized by the Centre d'Estudis Colombins.

3.1 Columbus's native language could not be Ligurian or Genoese

I selected four phenomena to observe, in which Ligurian maintains the distinction that Central-Eastern Catalan had already eliminated. These four phenomena are:

- neutralization (confusion) of unstressed **o** and **u**,
- neutralization (confusion) of unstressed **a** and **e**,
- betacism (confusion of **b** and **v**),
- graphic variations of voiceless and voiced sibilants ("**c, ç, s, ss**").

These phenomena manifest as hesitations in his own writings and discrepancies with the prevailing usages of his contemporaries found in the CORDE (Corpus Diacrónico del Español, Real Academia Española). The reason for choosing these four phenomena was that, according to authorities in Romance philology (Badia i Margarit, Martinet, Lausberg, Alsina, Blecua), **these confusions were active in 15th-century Eastern Catalan**, whereas **Ligurian completely lacked them**. It should be noted that DC sought a second opinion from an external auditor and provided the analyzed corpus and conclusions to Prof. Dr. Dr. Max Pfister, an eminent Romance philologist at Saarland University, who raised not the slightest objection to the methodology employed.

3.2 It could be Central-Eastern Catalan

In none of my works have I stated that Columbus was Catalan, but rather that **the interferences in his Spanish could match those of a Catalan speaker.** Specifically, I stated: *«It should be noted that our initial objective (determining whether **Columbus's native language could have been Catalan) is amply corroborated** (...) but this does not rule out that other languages presenting the same phonological oppositions as Catalan regarding the studied sounds could also be considered candidates for Columbus's native language; (...) this **excludes the proto-Italian spoken in Genoa**»*
It also excludes non-betacist variants of Catalan. And by the scientific principle of Occam's Razor, **Central-Eastern Catalan** remains the most plausible candidate as long as no other hypotheses compatible with my findings emerge.

3.3 Autograph texts vs. own texts

Upon observing that letters LXIII and LXIV did not exhibit the variables detected across the rest of the corpus, and moreover, that other patterns shifted from that moment onward, I considered whether these letters might not be autographs. All analyzed variables present an almost absolute reduction in the two aforementioned letters.

As an example of this *black hole*, we reproduce two histograms; first (Fig. 1), showing the distribution of words with **b/v** interference:

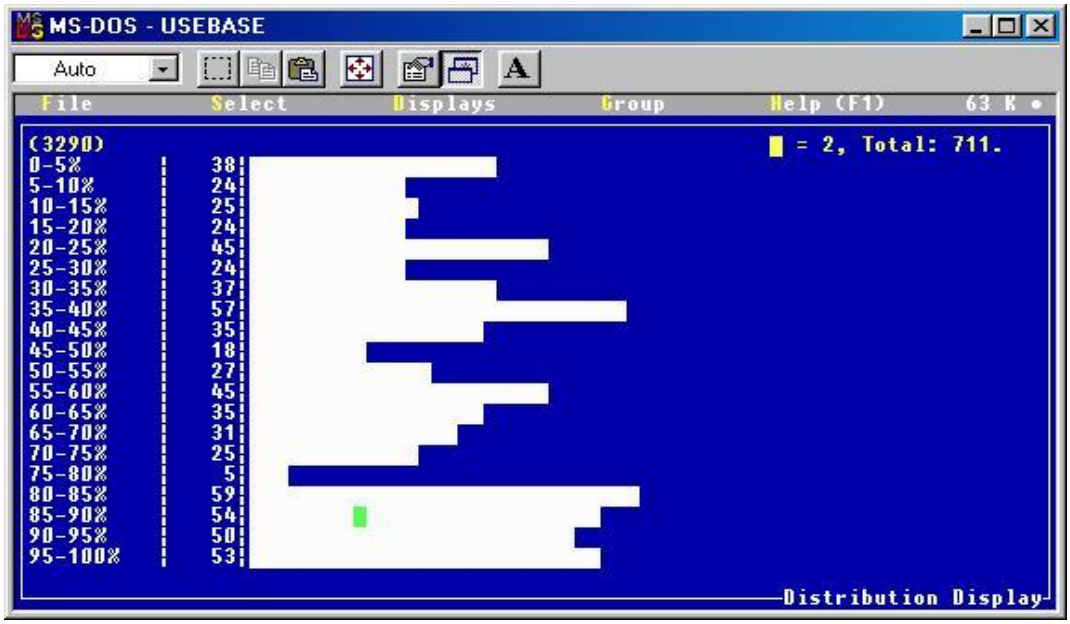


Fig. 1. *Histogram with the distribution of words with b/v interference.*

And as a second example (Fig. 2), words with "**çe/çi**" or "**ç=z**" interference:

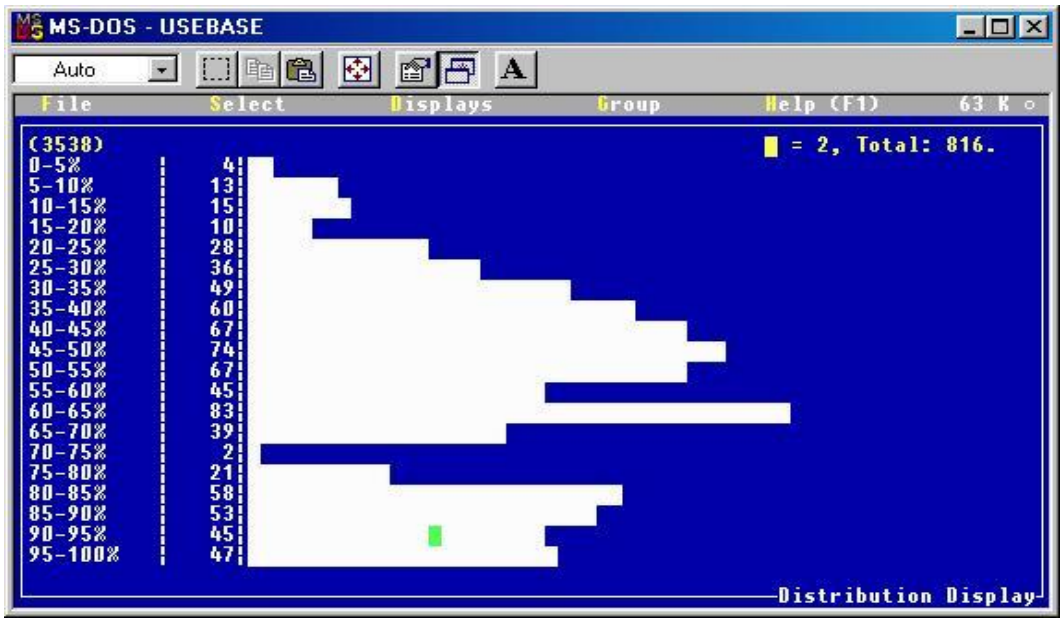


Fig. 2. *Distribution of words with "çe/çi" or "ç=z" interference.*

I asked Francesc Albardaner✞ to confidentially consult Dr. Varela, who reaffirmed her view that these are autograph letters, though raising the possibility that they might have been created from revised drafts or dictated.

In Mr. Albardaner's words, *"it occurs at a decisive historical moment: his arrest by Bobadilla and his fall from grace. Columbus made his third voyage from 1498 to 1500 and his fourth voyage from 1502 to 1504. Texts 63 and 64 are written to claim his rights. In addition to Dr. Varela's reason being accurate—that Columbus autographically copied a report prepared by a third party—it turns out that Columbus lost confidence, what little confidence he had left in the monarchs. Therefore, he learned his lesson and became very careful, suspicious, and cautious in everything he did. Thus, it would not be surprising if, from December 1500 onward, Columbian texts contained many more hypercorrections than prior to 1500!"*

I deemed it important to attribute the statement to Dr. Varela herself, so I reproduce below, with her permission, the exchange of emails we had once she was notified of this anomaly (which I termed a *"black hole"*, to the extent that the observed variables cease to present homogeneous results compared to preceding ones). She does not categorically state that these were texts that Columbus merely transcribed, but when confronted with the evidence of the results that raised my doubts about whether they were truly letters written by the Admiral, she proposed the hypothesis that Columbus might have confined himself to copying, for personal use, a text prepared by some legal expert ("leguleyo").

> To: "Consuelo Varela" xxxxx@eehaa.csic.es. Sent: Wednesday, April 05, 2006 11:06am. Subject: Comunicación Ibiza
>
> Dear Dr. Varela:
>
> Through Mr. Albardaner I have received a response to my questions regarding letters LXIII and LXIV (92 edition) in the sense that you confirm they are in Columbus's own hand, but that it seems plausible to you that the Admiral acted advised or copied out neatly a text revised due to the importance of these writings. (...)
>
> In any case, my research also reveals a change in Columbus's "ortho"graphic pattern from that moment on, which could offer ground for future research. Once I have your response and finalize the drafting of my paper, I will send it to you, and please know in advance that I would be delighted with any historical-linguistic collaboration to delve deeper into the matter.
>
> Warmest regards, Lluís de Yzaguirre i Maura (...)

First response:

From: "Consuelo Varela" xxxxxx@eehaa.csic.es. Date: April 7, 2006 11:38:38 AM GMT+02:00. To: Lluís de Yzaguirre i Maura lluis.deyzaguirre@upf.edu. Subject: Re: Comunicación Ibiza

Dear friend. Until today I had not seen the email; CICA (Andalusian Computer Center) is a terrible server, either broken or constantly being cleaned. As I mentioned to Francesc, I am confident—within what is possible—that those Memorials are Columbian autographs. And it only occurs to me that the Admiral was copying a text given to him by some legal expert and that, moreover, he did not slip in any of the forms we usually miss when writing. It should be compared with the letter he copied from Toscanelli to Martins, which everyone says is genuine, but not with the one he claimed Toscanelli wrote to him, which he likely fabricated. I am sorry I cannot be of more help. Best regards, Consuelo.

Second email:

Date: April 8, 2006 7:14:28 PM GMT+02:00. To: Lluís de Yzaguirre i Maura lluis.deyzaguirre@upf.edu. Subject: Re: Comunicación Ibiza

Dear friend. My School email has been broken. The regional government's server keeps breaking down or being repaired. Yesterday Francesc gave me your phone number, but I must have noted it down wrong because I cannot get through. Let's see. I am convinced that the two Memorials written by Columbus are autographs. To account for that black hole, it occurs to me that **it might be a copy made by the Admiral of some document from his lawyers.** In any case, even when copying, errors easily slip in; we all have patterns we repeat inadvertently. It would be worth examining—speaking as a layperson in this field—how Columbus transcribed the letter from Toscanelli to Martins, not the others he seems to have invented. **Of course you may cite me.** I would have liked to attend Menorca, but one cannot be everywhere, what a pity. Best regards and enjoy, Consuelo

(NB: **bold** emphasis is mine)

This response also confirms that the selected variables are significant. We must remember that there is not only the *black hole*, but also that the change is detected, for example, in the overall vocabulary with 'b' (which decreases from that point) and with 'v' (which increases)—meaning that subsequent writings intensify the trends observed in the first 70% of the corpus.

4. LEXICOMETRIC METHODOLOGY

The contribution of the lexicometric method, taking as reliable the indisputable dating of all analyzed writings, is that it allows us to determine that the earliest writings diverge considerably—regarding the observed variables—from contemporary Spanish, whereas over the years the discrepancies diminish and even hypercorrections typical of the process of becoming aware of L1 (mother language) interferences are detected.

I applied partition analysis into 20 blocks of equal word count, an analysis that displays results in histograms like those on page 4. Among lexicometricians, different schools exist depending on whether words are graphically standardized and lemmatized:

- in our case, graphical standardization would have destroyed the differences we intended to analyze; it would have made sense, for instance, in semantic research, but not in phonological research;
- regarding lemmatization (replacing each word with its lemma, i.e., the infinitive for verbs, singular for nouns...), it was discarded due to DC's tight deadline, but in light of the results, it was not missed.

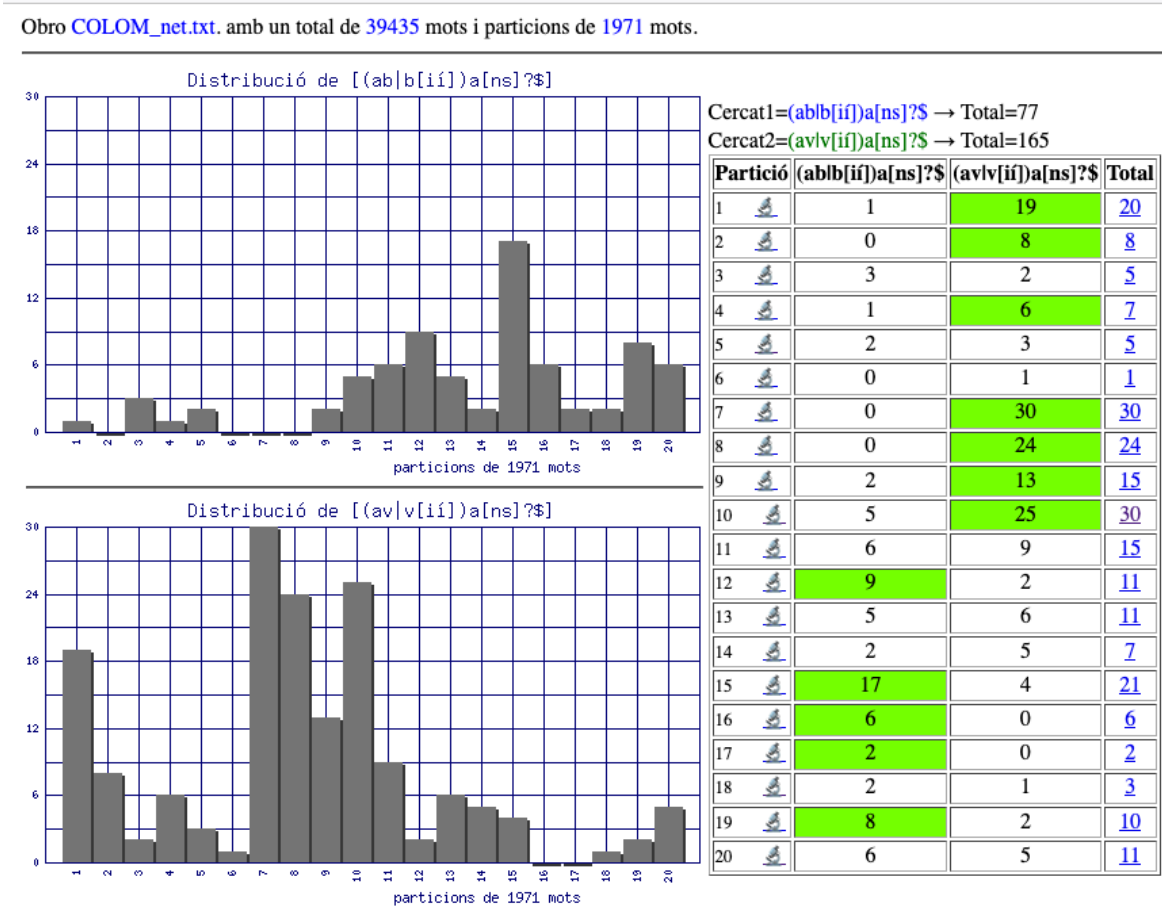
For those interested in a summary presentation, I propose the following; to explore further, I have included a section in the references with applications to various branches of the social sciences.

> *La lexicométrie est l'alliance des sciences du langage, des statistiques et de l'informatique. Elle permet de traiter de vastes ensembles de textes (corpus), d'établir leur vocabulaire, de classer les vocables en fonction de leur fréquence, de leur répartition, de leurs catégories grammaticales. Elle établit les contextes d'emploi d'un vocable et les combinaisons les plus fréquentes dans lesquelles il entre, ce qui permet de déterminer le ou les sens de ce vocable. Elle retrouve les principaux thèmes présents dans un corpus, son genre et son style. Elle segmente ce corpus en fonction des ruptures thématiques ou stylistiques. Pour obtenir ces résultats, des traitements préalables sont nécessaires : balisage des textes, correction et standardisation orthographiques, étiquetage des mots. Le texte peut alors entrer dans une bibliothèque électronique à la disposition des chercheurs.*
>
> Cyril Labbé, Dominique Labbé. Lexicométrie: quels outils pour les sciences humaines et sociales?. *Usages de la lexicométrie en sociologie*, Jun 2013, Guyancourt, France. ⟨hal-00834039⟩.

Twenty-five years have passed since I began this research (an eon in the computer universe) and the tool we used, the **TACT** package (Text Analysis Computer Tools) from the **Computing Centre for the Humanities** at the University of Toronto (Canada), is no longer available. I felt it necessary to provide a way to validate or falsify the research that enabled me to reach the conclusions synthesized in this paper. For this reason, I developed a web application integrating the main functionalities of TACT that were so useful to me.

Below I show an example of a query in **neoTACT**: I asked it for two 5% partition distributions (20 in total) of the Columbian corpus (Fig. 3); the first regular expression (ab|b[ií])a[ns]?$ retrieves 77 words ending in aba/abas/aban/bia/bias/bian (**with and without graphic accent**), while the second retrieves 165 words with the same endings written with v. Even if you have no intention of spending time challenging my findings, if

you have been interested in this topic this far, you will likely enjoy experimenting with it, especially if you understand how REGEX or regular expressions work.



Partició	(ab|b[ií])a[ns]?$	(av|v[ií])a[ns]?$	Total
1	1	19	20
2	0	8	8
3	3	2	5
4	1	6	7
5	2	3	5
6	0	1	1
7	0	30	30
8	0	24	24
9	2	13	15
10	5	25	30
11	6	9	15
12	9	2	11
13	5	6	11
14	2	5	7
15	17	4	21
16	6	0	6
17	2	0	2
18	2	1	3
19	8	2	10
20	6	5	11

Fig. 3. *Two 5% partition distributions of the Columbian corpus.*

5. CONCLUSIONS

In accordance with the initial objective, I have synthetically gathered the scattered conclusions and contributions regarding our application of lexicometric methodology to Christopher Columbus's autograph writings and provided a convenient way to access all previous works. Thus, it remains clear that the hypothesis regarding whether Christopher Columbus's native language could explain the **interferences in his Spanish is validated for Central-Eastern Catalan** and **falsified for Ligurian** or Genoese.

For anyone wishing to subject these contributions to independent verification, I have selected several sources demonstrating the application of lexicometrics to various fields of the social sciences and, finally, I have prepared a web application, **neoTACT**, enabling emulation of the tools offered by the TACT program with which I processed the Columbian writings decades ago.

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ACCESS TO AUTHOR'S CONTRIBUTIONS

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Errors of Christopher Columbus That Led to the Discovery of America

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ABSTRACT

Columbus was presumably born on October 31, 1451, and devoted most of his life to carrying out his project of reaching Asia by sailing westward across the Atlantic, as indicated by the Italian cosmographer Paolo Toscanelli.

He signed the Capitulations of Santa Fe with the Catholic Monarchs on April 17, 1492, which granted him enormous personal and economic privileges for himself and his descendants.

He made four voyages to the newly discovered lands, but never found the passage that would allow him to cross the American continent and sail onward to the Indies.

OBJECTIVE OF THE PAPER

This paper aims to demonstrate that a series of **errors in mathematical and geographical calculations** led Columbus to believe that the Earth was much smaller, and therefore distances would also be much shorter.

Paradoxically, those errors led to the discovery of the American continent. Columbus, until the day of his death and contrary to the evidence, continued to assert that he had reached the Indies, thus fulfilling what was agreed upon in the Capitulations of Santa Fe (reaching the Indies).

2. BACKGROUND

2.1 The Spice Routes

The dissolution of the Mongol state and the conquest of the Eastern Mediterranean by the Ottoman Empire in the 15th century made the Silk Road unviable, forcing Europeans to seek alternative routes to reach the East in search of spices.

The Portuguese chose to sail around Africa to reach Asia, while the Castilians, through Columbus, traveled westward across the Atlantic.

The most important routes in pursuit of the coveted spices were combinations of overland caravan travel and maritime navigation.

From Europe, the best route was sailing across the Mediterranean to Egypt (although the Mamluks were there, raising taxes on pepper, cinnamon, cloves, and nutmeg) and, once in Alexandria, heading by overland caravan to Cairo. Then they navigated the Red Sea to the Indian Ocean, and finally made their way to India.

Another route involved reaching Baghdad or Basra and then sailing through the Persian Gulf into the Indian Ocean, continuing onward to India. Once in India, they headed to Ceylon-China.

In 1453, when Columbus was two years old, the young Ottoman Sultan Mehmed II conquered Constantinople (the gateway to the East) and later the Bosphorus, closing access to the Black Sea. At that time Columbus was entering his adolescence.

The Ottoman Sultan took control of land and sea routes, making passage difficult, expensive, and controlled for spice seekers by imposing extremely high taxes. From that moment, Europe ceased to have free access to spices.

The Alexandria–Cairo–Red Sea route remained open, but was ruinous due to taxes. And the Acre–Aleppo–Baghdad route was insecure and difficult to undertake.

In 1475, when Columbus was 24 years old, the Ottomans conquered Caffa, the main Genoese outpost, further damaging the European spice market and leaving all existing spice routes closed:

- Silk Road.
- Black Sea route.
- Levant route.
- Egyptian-Red Sea route.
- Persian Gulf route.
- Indian-Monsoonal Ocean route.

Columbus, relying on the sphericity of the Earth and taking advantage of the disruption in the ancient routes, saw the opportune moment to carry out his project: sailing westward across the Atlantic to reach Asia. Columbus clearly foresaw that if Castile reached Asia via the west, it would dominate global trade.

Columbus met with King John II of Portugal to request funding for his project. The king convened a panel of experts to analyze it. The King's advisors advised against funding the project due to serious errors in the calculations.

Furthermore, Portugal was attempting to reach the Indian Ocean by circumnavigating Africa, so John II showed little interest.

Angered, Columbus headed to Castile to offer the project to the Catholic Monarchs. Like John II, Isabella and Ferdinand convened a commission of experts and mathematicians from the University of Salamanca, led by Friar Hernando de Talavera, who also warned the Catholic Monarchs of the errors in the project's distance calculations.

Columbus told the Catholic Monarchs he was certain that in little more than a month of sailing westward across the Atlantic they would reach Asia, from where they would bring back spices, silk, and vast amounts of gold.

The Catholic Monarchs, after so many years of war and with empty coffers, decided to support the project and sign the Capitulations of Santa Fe on April 17, 1492.

According to some authors, the Capitulations of Santa Fe were ratified upon his return from the First Voyage to confirm each and every one of Columbus's privileges.

Friar Bartolomé de las Casas stated that Columbus knew there were lands on the other side of the Atlantic.

During the First Voyage, Columbus encountered the American continent, which blocked his path. Had it not been there, the 90 crew members would have perished, as they no longer had water or food to continue the journey or return to Castile.

Columbus did not set out on the First Voyage intending to discover a new continent (he was aware of Europe, Asia, and Africa), but intending to reach Asia, as committed in the Capitulations of Santa Fe.

2.2 Regarding the Capitulations of Santa Fe (April 17, 1492)

Two copies were signed. One copy may have been registered by Juan Ruiz de Calçena (Registrar of the Chancery of Aragon). Two transcriptions of the original Capitulations of Santa Fe are preserved in the General Archive of the Indies.

Columbus must have been given **the original**, which **is lost today**. Before his death, Columbus deposited a copy of the Capitulations at the Charterhouse Monastery of Seville. Bartolomé de las Casas transcribed a copy of the capitulations in his *"Historia general de las Indias"* and introduced a modification in the first paragraph: instead of "**has discovered**," he wrote "is to discover" or "was to discover."

"Has discovered" in the header of the Capitulations suggests that Columbus attributed to himself discoveries and lands prior to 1492 (as a hypothesis) rather than a pre-discovery

theory.

To the Capitulations of Santa Fe, a letter of confirmation was added after the return from the First Voyage, and a letter of privilege on April 23, 1497, upon his return from the Second Voyage.

3. COLUMBUS'S CALCULATION ERRORS

For his nautical calculations, he relied on:

- The references of the Venetian Marco Polo (1254–1324), as he always carried with him *"The Book of Marvels."*
- The chart, map, and distances of Toscanelli, who drew Asia larger and further East, thereby narrowing the Atlantic Ocean.
- The calculations of Ptolemy (2nd century BC), who calculated the circumference of the Earth at 29,000 km.
- The calculations of the astronomer Al-Farghani (800s AD).
- He ignored the calculations of the Greek scholar Eratosthenes (3rd century BC), who estimated the Earth's circumference at about 40,000 km (39,375 km).
- And most importantly, **he confused Al-Farghani's Arabic miles** (1,973 m) **with Roman miles** (1,480 m), which were shorter, and with this serious confusion **he reduced the Earth by 25%.**
- Furthermore, Columbus habitually used the "**league**" (1,250 m) in his calculations, which further diminished the circumference of the Earth. **He reduced the Earth by approximately 36%.**

For Al-Farghani:
1 degree of meridian = 56 Arabic miles (exactly 56.667 miles).
56.667 Arabic miles x 360º = 20,400 miles (Earth's perimeter in miles).
Let us recall the equivalences of distance units:

1 Arabic mile = 1,973 m.
1 Roman mile = 1,480 m.
1 league = 1,250 m.

Calculation of the Earth's circumference (actual = 40,075 km):
For Al-Farghani: 20,400 Arabic miles x 1.973 km = 40,200 km.
For Columbus: 20,400 Arabic miles x 1.480 km = 30,192 km.
For Columbus using the league: 20,400 Arabic miles x 1.250 km = 25,500 km.
Calculation of the Earth's circumference, taking into account km per terrestrial degree:
For Al-Farghani:
56.667 Arabic miles x 1.973 km = 111.8 km/terrestrial degree.
111.8 km/terrestrial degree x 360º = 40,248 km.

According to Columbus with the **mile mistake**:
56.667 Arabic miles x 1.480 km = 83.87 km/terrestrial degree.
83.87 km/terrestrial degree x 360º = 30,193 km.

According to Columbus **using the league** instead of the mile:
56.667 Arabic miles x 1.250 km = 70.83375 km/terrestrial degree.
70.83375 km/terrestrial degree x 360º = 25,500 km.

Columbus accepted Al-Farghani's 20,400 miles as the circumference of the Earth, but for Al-Farghani these were **Arabic miles**, while Columbus assigned them the value of **Roman miles**. This confusion led him to believe the Earth was smaller.

Clarification:
56 2/3 (56.67) Arabic miles originates from a measurement made by the Arabs during the reign of Caliph Al-Ma'mun (around the year 830) to determine the value of a degree of terrestrial meridian. There were several results, but Al-Farghani used 56 2/3 = 56.67 am.

1º of terrestrial meridian = 56.667 Arabic miles (am).
56.667 Arabic miles x 360º = 20,400 Arabic miles (am).

Columbus, relying on Toscanelli's distances noted in the letter sent in 1474 to Fernão Martins (a copy of which Columbus obtained), stated:
That between Antillia and Cipangu there were 2,500 miles (10 spaces of 250 miles).
Columbus assured that the distance between the Canaries and Cipangu was 2,400 miles, when the actual distance is 10,600 miles (4.5 times greater).

2,400 miles / 10,660 miles = 22.6%.

Columbus was so mistaken that he claimed that to get from the Canaries to Cipangu he had to sail only 22.6% of the actual distance.

In summary, Columbus interpreted:

- Shorter miles and therefore shorter distances.
- The Earth 36% smaller.
- Asia larger, with a length of 10,000 km (54% larger), placing it much further east.
- The Atlantic 77% smaller. He reduced and narrowed it.
- He ignored the American continent.
- He ignored the Pacific (the world's largest ocean).

His son Hernando acknowledged that his father defended lower figures than those accepted by the cosmographers of his time.

And all those errors gave rise to the greatest discovery in history.

Columbus was always influenced by the ideas of Toscanelli (1397–1482).

All of Columbus's decisions were based on the letter, the map (whose originals are lost today), and the distances that Toscanelli sent in 1474 to Fernão Martins, explaining that it was possible to reach the Indies by sailing west.

The map accompanying the letter depicted the shortest route to reach Cipangu passing through the mythical island of **Antillia**.

Columbus became aware of this letter and map from Toscanelli, and no one knows how he acquired it, but both Columbus and his son Ferdinand claim that Toscanelli sent Columbus a copy.

His son Ferdinand, in *"The Life of the Admiral,"* stated that Toscanelli sent a letter to Columbus with a map and an outline of the route.

Columbus later copied the text into Latin in a copy of *Historia Rerum Ubique Gestarum*, which is currently preserved in the Capitular and Colombina Library of Seville.

On the 3rd voyage, when Columbus discovered the mouth of the Orinoco River, he must have realized that such a vast amount of water could only come from a continent; pulling from his spirituality, he came up with nothing better than to claim it was the entrance to Earthly Paradise. Columbus at this point must have been aware of the calculation and geographical errors he carried, though he never acknowledged them.

His son Hernando, in the *"Book of Prophecies,"* said that for Columbus to reach the Indies neither reason, nor mathematics, nor world maps were of any use to him.

Principally, what motivated Columbus to request a fourth voyage was to personally scrutinize the American coastlines to find a passage that would allow him to continue sailing westward.

Since Columbus never found the passage, he had no choice but to keep claiming he had reached the Indies. Although his health was severely deteriorated and he was aware of his remaining short lifespan, he wanted to ensure that his children could inherit everything granted in the Capitulations of Santa Fe.

And although Juan de la Cosa (owner and master of the nao Santa María) had published in 1500 the first world map in history showing the American continent, Columbus shortly before dying on May 20, 1506, in Valladolid, kept asserting that he had reached the Indies and fulfilled what was agreed in the Capitulations of Santa Fe, making him worthy of all promised privileges and perks.

He surely suspected that Ferdinand the Catholic wished to reduce his capitulation privileges, as his defender, Queen Isabella the Catholic, had died on November 16, 1504, in Medina del Campo, Valladolid.

In fact, as early as 1494, the Catholic Monarchs referred to the newly discovered lands as the **West Indies**.

Ferdinand the Catholic remained King of Aragon, but the Crown of Castile passed to his daughter Joanna I of Castile, though effective control fell into the hands of Philip the Handsome.

Nevertheless, when Queen Isabella the Catholic died, she left a provision requesting that Columbus's rights and privileges be respected.

Between 1504 and 1505, Columbus attempted to recover his privileges, although he was deeply disappointed both by losing the governorship of Hispaniola and by the deterioration of relations with Ferdinand the Catholic.

4. CONCLUSIONS AND DISCUSSION

In this paper we have sought to demonstrate that Columbus's errors were due to:

- The sources he used: Al-Farghani, Ptolemy, Marco Polo, Toscanelli.
- The maps and navigational instruments he used: portolan charts, Spanish and Portuguese maps, and theoretical maps by Henricus Martellus.
- The data he accepted as true when they were not.
- And mainly his **confusion regarding the value of miles** (Arabic vs. Roman).

Columbus, with those erroneous calculations, concluded that Asia was definitively close enough to reach quickly by sailing westward across the Atlantic in little more than a month.

Discussions on Columbus's Errors

- Columbus did not start from an absurd idea; he was mistaken in his calculations.
- His main error was accepting that the Earth's circumference was smaller and favorably interpreting the value of the miles used from his sources (confusing Arabic miles with shorter Roman miles).
- Marco Polo and Toscanelli led him to believe that Asia was further east, and that sailing west made it accessible.
- He underestimated the distance between Europe and Asia.

The main conclusion is that Columbus discovered the American continent and, although he was not the first foreigner to step on those lands, he was the first to step on them solemnly to take possession in the name of the Catholic Monarchs, returning to Castile to tell and

spread the news.

At that time, they knew how to calculate latitude through various means, but not longitude, which began to be used when the marine chronometer was invented in the 18th century. Columbus observed magnetic declination, but did not trust it.

Columbus based his navigation on:

- Heading / Course.
- Latitude.
- Time.
- Speed.
- Depth.
- Cartography.
- Advanced astronomical tables of Abraham Zacuto.
- Theoretical maps such as that of Henricus Martellus.

He navigated with simple yet effective instruments to calculate latitude, avoiding more complex instruments due to their inaccuracy on the open sea. He did not use the nocturlabe, which could calculate time by the position of the stars.

Columbus navigated by dead reckoning, calculation of latitude, and with the accumulated experience of years as a great navigator.

He used:

- Compass, which indicated magnetic north.
- Quadrant and cross-staff, to measure celestial altitude and calculate latitude.
- Hourglass (**ampolleta**), to track time.
- Sounding lead (escandallo), to calculate depth.
- He carried but did not use the astrolabe.

The discovery of America was not due solely to Columbus's error, but to a chain of geographical and mathematical errors that shortened the distances Columbus expected to find on his First Voyage—all of which together resulted in the greatest discovery in history.

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The Port of Pals According to New Archaeological, Geological, and Documentary Contributions

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ABSTRACT

This paper[1] analyzes new documentary, cartographic, archaeological, and geological evidence regarding the historical port of Pals (Baix Empordà) and its evolution between the 13th and 18th centuries. The research integrates primary sources from archives, historical cartography, archaeological excavations, geophysical surveys, and geological studies with radiocarbon dating and carpological analyses.

The results **confirm the existence of a stable harbor site** with intense fishing and commercial activity, as well as identify key infrastructure associated with its operation, notably the Tower of Pals and the Molí Gros (Great Mill) complex. This body of evidence contributes to reconstructing the historical configuration of the Pals coastline and provides new data for understanding navigation and maritime trade in late medieval and modern Catalonia.

Finally, once its active existence during the 15th century is confirmed, the possibility of links between Pals and the discoverer of America, Christopher Columbus, opens up.

1. HISTORICAL CONTEXT

At present, and in relation to the issue of Columbian historical research as well as the eternal discussions and theories about his origin, a new scenario appears evident following the presentation of the RTVE documentary *«Colón ADN: Su verdadero origen»*, the result of the research and DNA analysis conducted by Professor José Antonio Lorente of the University of Granada and his team.

As is known, their studies ruled out the navigator's Genoese origin, and after offering an initial preview of their scientific work—in which the other main candidate theories were also

[1] This paper is based on an article co-authored by the author and Narcís Subirana, titled "El Port de Pals," published in 2013 in the *Annals de l'Institut d'Estudis Gironins* (Vol. LIV), and now incorporates new data and methodology (Sans and Subirana, 2013).

scientifically ruled out—the report made public that Christopher Columbus originated from somewhere in the (Spain's) Western Mediterranean arc.

Unprecedented data and an approach to a specific geographical area, stemming from the conclusions provided by DNA and science, open a new window of investigation.

Within the (Spain's) Mediterranean arc lies Catalonia, and within this geographical enclave is rooted the thesis considered the most solidly grounded. As is known, this was defended throughout his life by the eminent Peruvian historian Luis Ulloa, father of the Catalan theory, when in 1927 he demonstrated here in Barcelona, during lectures at the Ateneu Barcelonès, that the discoverer's origin was Catalan and that he hailed from the Colom family—spelled with a final M, as his surname is actually written in early primary documents considered authentic, such as the *Epistola Christophori Colom* (Colom, 1493).

Abundant information exists regarding the Catalan thesis through the reading of Luis Ulloa's works (2006, 2014). Ulloa's transcendent role was bringing his thesis to the International Congress of Americanists, internationalizing it and causing a stir in the academic world. The enthusiasm of Catalan academic circles collided with a fierce attack from official historiographical circles and the press in Madrid, which launched a crusade against Ulloa and the Catalan thesis.

Newspapers and academics rejected and disputed his studies, and would continue to do so thereafter, maintaining the official position that Columbus was Genoese (or of Castilian origin), a stance that persists to this day.

This work is structured across two interconnected time periods: the material context of the modern era (13th–18th centuries) and the historiographical context of the early 20th century.

The material and geopolitical framework of the Port of Pals during these centuries is linked to the evolution of the Empordà maritime façade and the weight of territories under the sovereignty of the King of Aragon and Count of Barcelona in the Western Mediterranean.

The port reality and coastal dynamics (13th–15th centuries) enabled this sector to act as an anchorage point, local trade hub, and coastal defense, integrated into a network of small ports and roadsteads providing an outlet for agricultural and craft production from small towns like Pals and its surroundings in the Baix Empordà region (Catalonia).

The transformation of the space and its subsequent decline (16th–18th centuries) was due to two factors: the progressive geological silting up of the natural harbor and the shift in trade routes following the opening of the Atlantic, as well as military conflicts (the Reapers' War or the War of the Spanish Succession). Documentation and archaeology from these centuries reflect the effort to maintain activity in the face of a changing geology and a new geopolitical order.

The historiographical context is tied to the debate over Columbus/Colón with the birth of Ulloa's thesis (1927), demonstrating how an element of local maritime history became the subject of an identity and scientific debate.

In 1927, while Ulloa published his thesis defending Christopher Columbus's Catalan origin, Spain was under the dictatorship of Primo de Rivera, a regime characterized by heavy censorship and repression against Catalan institutions and language.

In addition to reconstructing the maritime and geological history of Baix Empordà, this historical context engages in a dialogue with the genealogy of one of the most passionate debates in Iberian historiography, providing an evidentiary thesis regarding the departure point of the discoverer's first voyage.

Given that we lack a definitive chancery document from the era to establish a categorical link between the Port of Pals and Columbian navigation, we methodologically align with Carlo Ginzburg's evidentiary paradigm (2008, 185-239). As the Italian historian points out:

> *"When political-documentary reality is impenetrable or fragmented, it is the documentary anomalies of the 13th to 18th centuries that allow us to decipher the facts."*

2. METHODOLOGY AND SOURCES

This investigation was carried out using an interdisciplinary methodology based on the integration of documentary, cartographic, archaeological, and geological sources, aiming to reconstruct the historical evolution of the Pals port site and to test its existence and functionality from a scientific perspective.

Documentary research was founded on the analysis of primary sources originating mainly from the Archive of the Crown of Aragon and the Regional Historical Archive of La Bisbal d'Empordà, as well as notarial records, administrative registers, and historiographical sources related to the town's maritime and commercial activity.

Concurrently, an analysis of historical cartography was conducted as an auxiliary science of history, enabling the reconstruction of the paleogeography of the Pals coastline, the identification of ancient place-names, and an understanding of the evolution of the shoreline and port spaces.

Documentary evidence was cross-referenced with the results of several archaeological interventions, geophysical surveys, and geological studies conducted between 2011 and 2018, including stratigraphic excavations, magnetic surveys, ground-penetrating radar (GPR), radiocarbon C-14 dating, and carpological analyses.

The study adopts a cross-disciplinary verification methodology, whereby conclusions are

considered consolidated only when documentary, archaeological, geological, and cartographic evidence converges on the same historical interpretation. This approach reduces reliance on a single type of source and enhances the robustness of the findings.

3. CATALANS AND THE ART OF NAVIGATION

Regarding the art of navigation in historical cartography, the Portuguese geographer and diplomat Viscount of Santarém, widely recognized as a pioneer in the study of historical cartography (19th century), documented in his time the historical significance of Catalans, Venetians, and Genoese in medieval cartography and maritime expansion.

In his work, Santarém acknowledged the crucial role of navigators from the Crown of Aragon, highlighting how Catalans and Majorcans developed an outstanding cartographic school, actively exploring routes to West Africa, the Canary Islands (alongside the Genoese), and the Atlantic.

Santarém emphasized that these Mediterranean nations were the great commercial and cartographic pioneers who laid the foundations for subsequent Iberian Atlantic explorations. Since Catalans, Venetians, and Genoese were the dominant nations in naval warfare and the most skilled in seamanship, and their cosmographers were the most renowned and famous, it is no surprise that the *Llibre del Consolat de Mar* (Book of the Consulate of the Sea) served as the model to be emulated by other countries.

> *"The first time France waged a naval war, it faced the most formidable naval power against it" (Charles de la Roncière, naval historian, referring to the Catalan navy and the naval battle of Roses in 1285).*

A branch of the Catalan thesis examines the port of departure for Christopher Columbus's first voyage, incorporating a long historiographical dispute between supporters and detractors, as the latter argued that Pals had never possessed a port, given that the town is currently located 3 km inland from the beach.

In this context, and with the goal of shedding light on this questioned port, my research carried out at the Cercle Català d'Història began tracing the Port of Pals through archival works, documents, and primary sources, yielding several key results.

Author Coral Cuadrada, in her book *La Mediterrània, cruïlla de mercaders* (Dalmau Publishing), when discussing ports, states:

> *"We find Occitan ports, [...] Italian centers—Genoa and Venice—and Catalan ports—Collioure, Roses, Pals, Tarragona, Tortosa."*

Antoni de Campmany's *Memòries* refer to Pals as a maritime town:

> *"Villa de Paludibus.* ***Town of Pals, Maritime Town of Catalonia****" (Campmany, 1961).*

Cartography, recognized as an auxiliary science of history, ultimately reveals the true outline of the ancient coastline across numerous historical maps (see Fig. 1). There appears the shape of an ancient gulf on Pals beach, now non-existent, which on storm days reached much further inland where the roaring of waves could be heard, as noted by Josep Pla himself.



Fig.1 *New geographical description of the Principality of Catalonia. D. Josef Aparici. 1769. ICGC.*

This cartography reveals the place-name indicating the existence of a coastal settlement belonging to Pals. If today locals know Pals–Masos de Pals–Torre Mora, previously they were called Pals–Sant Fructuós–Torre de Pals.

This cartography also shows the long-disappeared **Pals Lake** and **Marisc Lake**, fed by the two branches of the Ter and Daró rivers, which no longer exist today.

The current coastline has advanced approximately 300 meters due to sediment accumulation brought by the Ter and Daró rivers. This sedimentation was a key factor leading to the abandonment of fishing, as it eventually silted up and buried the Port of Pals.

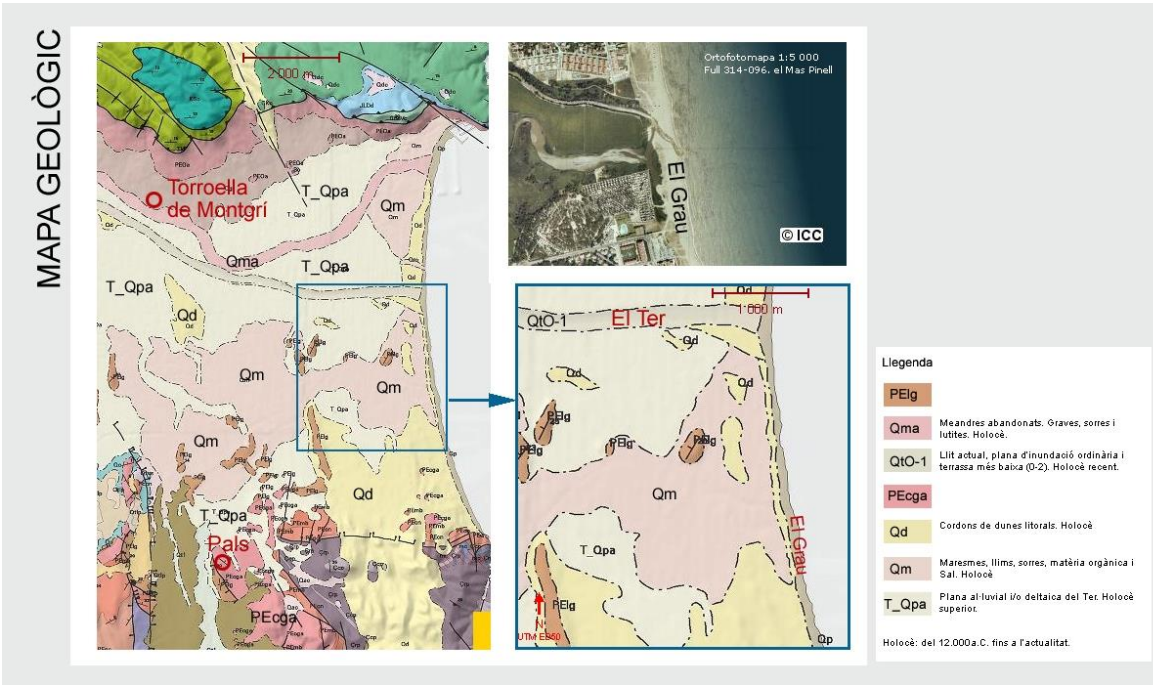

Fig.2 *Geological map of Pals by Lluís Pallí i Buxó and Carles Roqué i Pau.*

This sedimentation phenomenon was studied by geologist and geographer Joan Carandell i Pericay in his book *El Bajo Ampurdán* (Carandell, 1978). Carandell notes: *«This is what happens at the Grau del Ter, a rich fishing ground abundant in mullet, sea bass, and all kinds of fish thriving in the mixture of fresh and salt water.»* Lluís Pallí i Buxó and Carles Roqué i Pau also produced the geological map of Pals in 1992, of major importance for this research (Pallí & Roqué, 1992).

The aforementioned cartography provided knowledge regarding the ancient fishing village of Pals thanks to the place-name **Torre de Pals**.

As seen in Fig. 2, it was located next to the inlet (*grau*) opening into the large gulf referenced in various documents. The word **grau** means "port." It was a term in common use during the medieval and modern periods, as in the cases of Grau de Castelló or Grau de València.

Further inland from the current coast, about 3 km to the west, stands Pals, the ancient medieval town built on the rocky hills of Mont-aspre. As we shall see, in the past it was a seafaring town with a port, fishing activity, vessels, and international trade. Transport was mostly conducted by sea and river, through lakes, waterways, and the ocean.

Maritime transport was the most widely used and fastest route for commodities such as rice, wine—one of the main agricultural outputs of the region—and linen textiles produced in Empordà. Overland roads in Baix Empordà were nearly impassable due to marshes and highwaymen. The advantage of sea transport was indisputable in terms of safety, cargo capacity, and tonnage.

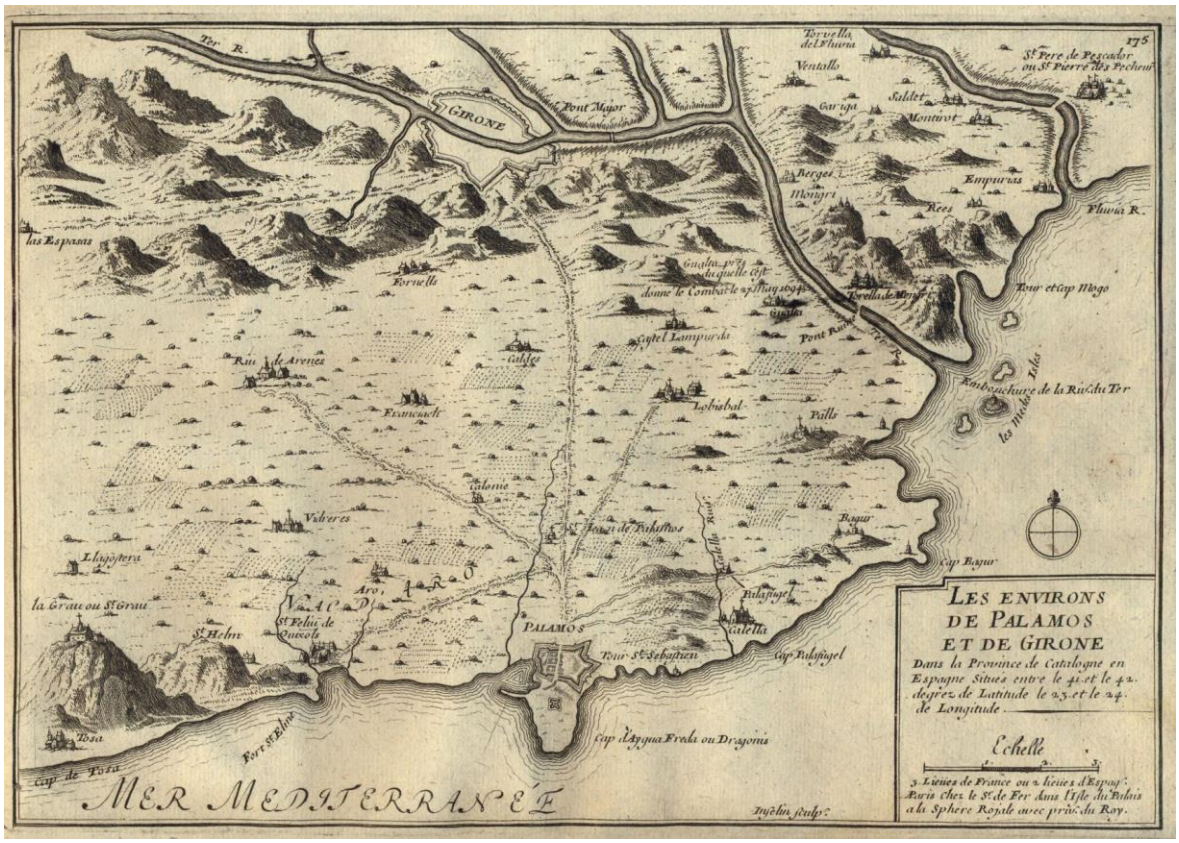

Fig.3 *Map by Nicolas de Fer, 1705.*

We have a 17th-century description of La Bisbal d'Empordà, a town near Pals, describing those ancient roads (Ferrer i Gironès, 1982):

> *"The roads for communication to nearby and larger towns, although all public, are in terrible condition, except the one heading to the city of Girona, which is passable; those leading to the towns of Calonge, Palamós, and Sant Feliu de Guíxols located to the south are extremely narrow and bad due to the mountainous terrain, making wheeled transit impossible."*

4. REDISCOVERING THE PORT OF PALS AREA

Torre Mora or Torre de Pals stands approximately 300 meters from the coast amidst pine groves, outside and west of the former **Radio Liberty** facilities. It was built under royal authorization for port defense. The surrounding archaeological remains, cataloged as BCIN (Cultural Asset of National Interest), are closely tied to the structures known as fishermen's stores (*botigues de pescadors*), located within the state-owned Ràdio Liberty grounds, an area currently abandoned.

The first archaeological excavation of Torre de Pals in 2011 confirmed that the defensive structure protected an active port with prominent fishing and export operations during the

17th and 18th centuries, owing to abundant sardine grounds. Historical and archival notary records uncovered by the Cercle Català d'Història document a sizable seafaring population and active salt-fish trade exporting to Italy and France.

Fellow researcher Narcís Subirana documented an abundant seafaring, fishing, and maritime workforce, with over twenty documented mariners and sixty fishermen, such as Antoni Bertran, a mariner who died in 1639, or Bartra Martinench—a sea tower gunner originally from Six-Fours, Kingdom of France. Added to this is the discovery by Anna Maria Corredor of Pals, who documented in 1717 notary records a mariner from **portus Pals** named Joannis Ballesta (Corredor, 1998).

Primary archival research bore fruit at the Archive of the Crown of Aragon (Barcelona). The first document found is an 18th-century sea protest registry from the Consulate of the Sea (1766–1868, ACA, Reial Audiència). On September 24, 1790, Captain Bartholomé Copelo of the polacre *Nuestra Señora de Monte Negro*, registered in Jerusalem with a cargo of casks, reported sailing the route Pals–Portofino–Anglet–Barcelona.

In his statement, Copelo specifies:

> *"And I state that the vessel being watertight and equipped with everything necessary for navigation departed from Pals on the twenty-second day of July with a cargo of casks, and from said port toward Portofino in the morning, finding itself off Anglet in France, encountered a heavy storm of wind, sea, rain, and thunder..."*

Second, a 1607 lawsuit record (ACA, Reial Patrimoni) details a lawsuit filed by merchant Joseph Cerdà against the jurors of Pals for attempting to levy a new tax on all fishermen, including locals who already paid the fish tithe. In this dispute, no one could fish in the Pals waters without paying this tax, deemed illegal.

These waters were rich in fish due to the brackish mixture of fresh and salt water converging in the gulf.

For example, the document records testimony from another fisherman describing how fifteen or sixteen boats assembled, and jurors demanded to pay the tax previous to be able to fish; then they went to see them:

> *"Anthony Galua, John Galua and John Fermia, all of them from Palamos, and requested them to pay 24 reals per each boat, before allowing them to fish."*

Third, a court seal from the Castle of Pals found in an ACA collection (Segarra, 1916–1932) certifies commercial transactions in Pals in 1406. The 40 mm seal features a coat of arms with three royal bars and the legend «+ S DE LA CORT DEL CASTELL DE PALS» [Seal of the Court of Pals Castle]. Stamped on paper over red wax, it accompanies a handwritten receipt granted by «*En Joan Abril, bailiff of Pals, to Antoni Vinyals, skipper of a llagut boat*

*from Palamós, for loading a sack of flour at the **port of Pals** to be unloaded in Barcelona. Dated at the Castle of Pals, July 29, 1406, sigillo curie nostre munitum»* (ACA, Seal Collection).

In recent years, new references have continuously emerged demonstrating the active **existence of the Port of Pals from the 14th to the 18th century.**

The work of Maubert Claude-Guy (1980) provides references for grain shipments from Catalan ports, mentioning several grain departures from the Port of Pals during the 14th century, noting that Empordà was a primary granary of Catalonia exporting grain to Barcelona for redistribution.

To better document the port's existence, a multi-disciplinary archaeological and geological study was initiated in 2011, yielding scientific data confirming the existence of the Port of Pals.

5. HISTORICAL AND ARCHAEOLOGICAL REPORT ON THE "TORRE DE PALS" SITE AND RÀDIO LIBERTY SURROUNDINGS (2011–2018)

5.1. Introduction and Historical Context (13th–18th Centuries)

Documentary and archaeological investigations demonstrate that the Pals site constituted a first-rate port, fishing, and commercial center on the Catalan coast, with continuous occupation from the 13th to the 18th century.

- **Halieutic and Commercial Activity**: The area hosted the principal sardine grounds of the Principality, prompting seasonal migrations of fishing communities from Alt Empordà and Roussillon. Production was processed via salting at Torre de Pals and exported by sea to international markets in Italy, France, and the Iberian Peninsula.

- **Demography and Maritime Trades**: Notary records document a stable, year-round population tied to maritime activity and coastal defense, including indigenous mariners (such as Antoni Bertran or Joannis Ballesta) and foreign personnel serving in the military garrison.

5.2. Archaeological Interventions at "Torre de Pals" (2011 Campaign)

The first excavation campaign, promoted by Cercle Català d'Història with Pals Town Council and directed by archaeologist Maria José Caja, yielded key scientific data:

- **Defensive Architecture**: It was established that the tower was built under royal authorization specifically to protect the port.

- **Perimeter Discovery**: A rectangular wall surrounding the tower was uncovered, serving as a defensive outer wall from the same chronological phase (late medieval to early modern, 15th–17th centuries).

- **Functional Evolution**: In later phases, this defensive wall was repurposed as structural support for commercial storehouses (*botigues*).

5.3. Geophysical Survey (2017 Campaign)

To map the site extent and historical topography, Cercle Català d'Història commissioned a non-destructive geophysical survey (magnetic and GPR) within the former Ràdio Liberty grounds, executed by SOT:

- **Subsurface Anomalies**: Buried structures beneath sand layers were identified.

- **Paleogeography**: The morphology of the ancient fishermen's cove was mapped, showing traces of a submerged rocky headland.

5.4. Excavations at the Ràdio Liberty Grounds (2018 Campaign)

The 2017 results prompted a 2018 excavation (Augé & Codina, 2020) co-organized by Cercle Català d'Història and the Archaeological Heritage Service of Catalonia. Four soundings across two structures revealed:

- **Chronological Dating**: Mortar samples from foundations dated structures between the 13th and 17th centuries.

- **Material Culture**: Ceramic assemblages included polychrome and monochrome glazed wares (bowls, pitchers, covers) and reduced-firing cookware (pots). 18th-century paleonutritional food remains were also recovered.

- **Geomorphological Confirmation**: Confirmed that Radio Liberty sits atop a historical rocky headland (now dune-covered) sheltering the cove where fishermen operated, corroborating continuous human occupation and maritime use.

5.5. Geological Survey (2018 Campaign) - Technical Report: Chronological and Carpological Analysis of Sounding RLL-1

- **Radiocarbon Dating (C-14)**: Sounding RLL-1 intercepted a 20 cm thick dark peat layer at a depth of 3.63 m (1.03 m below current sea level). Carbonized wood samples submitted for radiocarbon analysis yielded a date between the 17th and 18th centuries (Geoservei, 2018).

- **Carpological Analysis and Anthropic Evidence**: Macroscopic plant remains (seeds/shells) analyzed by Dr. Alexandra Livarda (University of Nottingham) identified (Livarda, 2018):

  - *Prunus avium/cerasus:* cherry stones.
  - *Vitis vinifera:* grape seeds.
  - *Olea europaea:* olive pit fragments.
  - *Corylus avellana:* hazelnut shells.
  - *Quercus sp.:* oak acorn cups.

- **Socioeconomic and Maritime Logistics Interpretation**: The edible plant assembly indicates anthropic food waste. Preservable items (raisins, dried cherries, salted olives, nuts) suggest maritime provisions for crews or trade cargo, confirming the harbor's logistical role sheltered by the rocky headland.

6. THE ANCIENT PALS MILL COMPLEX AND ITS PORT INFRASTRUCTURE

6.1. Ownership and Institutional Context

The Pals enclave possessed multiple port infrastructures, notably at Molí Gros (Great Mill). This complex was owned by the influential Pere family, royal notaries of Girona whose members held high positions at court, including Miquel Pere, protonotary to King Ferdinand the Catholic.

6.2. The Emphyteusis Contract of 1452 and Maritime Transport Function

On September 9, 1452, an emphyteusis contract was formalized in Barcelona to convert and build a rice mill (originally a flour mill). Signed by Jaume Giner on behalf of the King of Aragon before prominent witnesses (Guillem Spital, Nicolau Exerrat, Pere Bartomeu Valls), the contract established major logistical clauses:

- **Canalization and Dredging**: Right granted to intervene in waterways to ensure unobstructed discharge into the sea.
- **Commercial Navigability**: Obligation to maintain open, canalized waterways allowing direct vessel access (*llaguts, llaüts, fustes*) from the coast to the mill itself.
- **Port Inlet Control**: Miquel Pere received royal authorization to manage canal waters and keep the *grau* (port inlet) open on the beach.

6.3. Hydrographic Connection of the Canal

Records in the Regional Historical Archive of La Bisbal d'Empordà confirm the mill's direct sea connection via the Adaró (Daró) river, which flowed from Les Gavarres through Ullastret lake, channeling past Gualta to the Pals Mill and discharging at Pals beach.

7. COMPARATIVE NOTE BETWEEN PALS AND PALOS (HUELVA)

We want to draw attention to the **absence of documentation from the period in the municipal historical archives of Pals and Begur**, which do not preserve documentation from, for example, the 15th century, but their own funds start from the second half of the 16th century (although ordinary administrative documentation abounds mainly from the 19th century).

On the other hand, the archive of the Bisbal d'Empordà is in abundance in custody as well as in many other Empordà towns. Likewise, scattered documentation has been kept in other large repositories, such as the old Royal Archives of Barcelona –officially renamed the Archives of the Crown of Aragon in 1754– and in various notarial and county funds.

Unfortunately, a very important part of the funds in this area (Pals, Begur, Regencós...) was lost over time due to various historical factors. For this reason, it was necessary to carry out a true *archeology of archives* to locate the documents that allow us to reconstruct what daily life was like on the Empordà coastal front during the Middle and Modern Ages.

Having thus far demonstrated the existence of the port of Pals, we will mention one of the most controversial topics in current historiography.

It is about the **possible departure from the port of Pals** of Christopher Columbus' first voyage to the Indies. Although there is currently no proof that can prove this, there are certain data that should be used for reflection. For example, Fig. 4.

With the confirmation derived from the archaeological excavations promoted by the University of Huelva in Palos to locate the port and the castle, carried out during the years 2014 to 2019, two very interesting publications:

> *Historic port and castle of Palos de la Frontera (Huelva) protagonists of the Colombian feat.* Juan Manuel Campos Carrasco (2014), University of Huelva. Collectanea, 191.
>
> *The geoarchaeological recovery of the historic port of Palos de la Frontera (14th-16th centuries) Natural environment and port facilities.* Jose Manuel Campos Carrasco (2020), University of Huelva. Collectanea, 224.

Archaeological excavations led by the University of Huelva at Palos de la Frontera (2014–2019) published major findings (Campos Carrasco 2014, 2020), concluding that **Palos de la Frontera lacked city walls**.



1



2

Portada de la *Historia General de los Hechos de los Castellanos*, de 1601 (1 i 2).



3

3 La vila empordanesa de Pals vers el 1940.

Fig. 4 *Palos-Pals comparison.*



Fig. 5 *Aerial photograph of Pals.*

Furthermore, Hernando Columbus, traveling in 1517 for his *Cosmografía de España*, **described Palos as an unwalled town** ("Lugar") possessing a fortress castle, matching the archaeological findings at Palos (Laborda, 2002: 143).

Conversely, historical engravings depicting Columbus's departure from Palos—such as that by contemporary artist Theodor de Bry (1594)—consistently depict a **walled maritime city** (Fig. 6).

This comparative note serves to look beyond official narratives and advance historical truth.

8. CONCLUSIONS

Our organization has conducted research on Columbian issues for years, specializing in documentary, cartographic, and archival research, presenting at the 54th ICA (Vienna, 2012) and 56th ICA (Salamanca, 2018).

Integrated analysis of documentary, cartographic, archaeological, and geological evidence confirms an **active port site at Pals** between the 13th and 18th centuries.



Fig. 6. *Engraving by Theodor de Bry (1594) - Part of the famous series of chronicles and publications on the voyages of discoverers edited by the De Bry family.*

Documentary sources prove intense fishing and trade activity, while archaeological and geological studies confirm port infrastructure, continuous human occupation, and ancient coastal geography.

The study of Molí Gros provides new data on logistical organization and maritime transport. This evidence expands knowledge of medieval and early modern Catalan maritime history, recovering a forgotten port.

The primary contribution is integrating previously fragmented documentary, archaeological, geophysical, and geological evidence.

While lacking a single chancery document certifying a direct link to Columbian navigation, new physical and archival data fundamentally transform the debate, providing physical evidence that elevates the **Pals departure hypothesis** from conjecture to a solid historical model.

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The Historical Authentication of the Remains Attributed to Christopher Columbus: A Critical Review of Documentary and Scientific Evidence

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ABSTRACT

The identification of the mortal remains attributed to Christopher Columbus constitutes one of the most controversial issues in Columbian historiography. Despite the broad institutional recognition of the remains preserved in the Cathedral of Seville, their authentication presents difficulties stemming from the documentary reconstruction of the remains' trajectory and the evidentiary scope of available scientific evidence, which is often more limited than implied when presented publicly as definitive.

This paper[2] evaluates the extent to which the traditional identification can be considered historically accredited through an interdisciplinary analysis of the sources regarding the death, burial, and successive transfers attributed to the remains, cross-referenced with contributions from genetics, physical anthropology, and other auxiliary disciplines. The research applies the principles of documentary criticism and examines the independence and consistency of sources, the continuity of the chain of custody, and the convergence between documentary, material, and scientific evidence. The work operates on the premise that this authentication is, methodologically, a prior and independent issue from the controversy regarding the location of the remains between Seville and Santo Domingo, and that it must be resolved before taking a side in that debate.

The results show that the traditional reconstruction possesses elements compatible with the attribution, but presents documentary discontinuities, dependencies among testimonies, and limitations in the identification capacity of scientific testing. These difficulties do not allow for the rejection of the attribution of the remains preserved in Seville, nor do they permit considering it historically accredited through a sufficient convergence of independent evidence.

[2] This paper takes as its starting point the author's undergard's thesis, *Study on the authenticity of the mortal remains attributed to Christopher Columbus, deposited in the Seville Cathedral* (Open University of Catalonia, UOC, 2023). The research presented here revises, expands and reformulates that study through a new methodological framework focused on documentary criticism, the reconstruction of the chain of custody and the evaluation of the convergence between documentary, material and scientific evidence.

The conclusion is that the traditional identification is plausible, but not sufficiently accredited under the current state of evidence, and that authentication constitutes a methodologically prior question to the controversy over the location of the remains between Seville and Santo Domingo.

1. INTRODUCTION

Few historical figures have generated such an extensive bibliographical production as Christopher Columbus. More than five centuries after the discovery of America, his figure continues to spark debates on issues as diverse as his origin, language, cultural background, or nautical knowledge. Among these controversies persists an apparently more specific, yet historiographically complex question: the identification of his mortal remains.

The traditional version maintains that the Admiral died in Valladolid on May 20, 1506, and that his remains underwent several transfers until being deposited in the Cathedral of Seville. However, examination of the documentation concerning his death, burial, and successive transfers reveals discontinuities, chronological discrepancies, and transmission problems that make it difficult to consider fully demonstrated the continuity between the historical figure and the remains attributed to him.

This difficulty poses a central methodological problem: the identification of historical remains does not depend solely on biological or genetic compatibility, but also on the robustness of the documentation that allows reconstructing their provenance and chain of custody. This research therefore analyzes the extent to which available documentary, material, and scientific evidence allows considering the attribution of the remains preserved in Seville as historically accredited.

The study does not aim to establish an alternative location for the Admiral's remains, but rather to determine the degree of historical certainty that available evidence allows us to reach. This research takes as its starting point a previous study by the author on the authenticity of the remains attributed to Christopher Columbus (Ullan, 2023), which is here revised and expanded through a methodological framework focused on documentary criticism, the reconstruction of the chain of custody, and the convergence between independent evidence.

From this perspective, the controversy transcends the strictly funerary or archaeological realm and poses a broader historiographical question: the criteria through which a documentary tradition, repeated and institutionalized over time, comes to acquire the status of historical certainty. The authentication of the remains attributed to Columbus thus becomes a case study on the relationship between documentation, memory, scientific evidence, and historiographical construction.

2. STATE OF THE ART AND HISTORIOGRAPHICAL FRAMEWORK

The question of Christopher Columbus's mortal remains has generated an abundant historiographical output since the 19th century, articulated mainly around an alternative: whether the remains rest in the Cathedral of Seville or whether they correspond to the remains discovered in 1877 in the Primate Cathedral of Santo Domingo. This dichotomy has tended to relegate to the background a methodologically prior question: the robustness of the sources allowing the reconstruction of the trajectory attributed to the remains. The predominant interpretation, systematized by Antonio Ballesteros Beretta, holds that Columbus died in Valladolid in 1506, was transferred to the Sevillian monastery of Santa María de las Cuevas, taken to Santo Domingo in the mid-16th century, transferred to Havana in 1795, and finally returned to Seville in 1898; this sequence found support in Manuel Colmeiro's report for the Royal Academy of History, which defended its legitimacy.

Faced with this interpretation, the 1877 discovery gave rise to an alternative line: Emiliano Tejera argued that the remains exhumed by the Spaniards in 1795 corresponded not to the Admiral but to his son Diego, and that the authentic ones had remained in Santo Domingo. Throughout the 20th century, the debate progressively shifted toward critical documentary analysis: Anunciada Colón de Carvajal and Guadalupe Chocano Higueras highlighted contradictions in the burials and transfers, Carlos Serra Pickman questioned the solidity of the evidence regarding the traditional funerary trajectory, and Consuelo Varela, Juan Gil, and Antonio Rumeu de Armas revised the transmission and genuineness of Columbian biographical sources—a line especially relevant given that the reliability of funerary identification depends in part on the robustness of the prior biographical narrative.

In recent decades, the incorporation of experimental sciences—particularly the genetic project directed by José Antonio Lorente at the University of Granada, along with anthropological, forensic, and edaphological studies—has expanded the corpus of evidence without eliminating the controversy, since the interpretation of results remains tied to the prior identification of samples. Paleographic, linguistic, lexicometric, medical, and psychological studies have also been added which, without directly targeting the remains, allow cross-referencing the internal consistency of the traditional narrative with the historical figure.

Despite the breadth of this literature, a recurring limitation is detected: a large part of the studies has assumed as an initial framework the essential validity of the documentary sequence of death, burial, and transfers, so that the controversy has concentrated on determining which remains are authentic—those of Seville or those of Santo Domingo—without always subjecting the prior documentary chain to the same degree of critical scrutiny. It is in this void that the present research is situated: authentication is considered a problem prior to location, which implies examining together the reliability of sources, the continuity of the chain of custody, and the real capacity of scientific testing, rather than deciding prematurely between Seville and Santo Domingo.

3. OBJECTIVES AND METHODOLOGICAL APPROACH

The general objective of this research is to evaluate the extent to which available evidence allows considering historically accredited the authenticity of the remains attributed to Christopher Columbus preserved in the Cathedral of Seville, through five specific objectives: (1) to critically analyze the sources regarding the final years of life, death, and burial of Columbus; (2) to documentarily reconstruct the successive transfers attributed to his remains; (3) to assess the authenticity, independence, and consistency of the primary sources; (4) to cross-reference the documentary narrative with contributions from genetics, physical anthropology, and other auxiliary disciplines; and (5) to determine the extent to which different lines of evidence converge independently in favor of the traditional identification.

Methodologically, the investigation systematically confronts documentary sources, material evidence, and scientific results, applying the principles of external and internal documentary criticism (Bloch, 2022; Aróstegui, 2001) and assessing the probative weight of each source according to its temporal proximity to events, independence from other testimonies, internal coherence, and agreement with external sources. Within this framework, a distinction is made between documentary absence—which does not, by itself, constitute proof of non-existence—and positive evidentiary contradiction or incompatibility. A second axis is the reconstruction of the chain of custody: the verifiable sequence of identifications, burials, exhumations, and transfers that should connect the historical figure with the preserved remains, understood not as a requirement for absolute documentary continuity but as a sufficiently coherent and verifiable succession. Scientific evidence, finally, is evaluated according to its real identification capacity: a genetic or anthropological match can reinforce a hypothesis—corroboration—without being equivalent to a nominal identification if reference samples have not been independently identified. According to these criteria, a distinction is made between plausibility—compatibility with a significant portion of the evidence—and historical accreditation, which requires the independent, coherent, and robust convergence of these lines of proof.

4. UNCERTAINTIES REGARDING THE DEATH OF CHRISTOPHER COLUMBUS

The traditionally accepted version maintains that Christopher Columbus died in Valladolid on May 20, 1506, and was buried in the convent of San Francisco in that city. Main witnesses—Hernando Colón (1984: 349), Bartolomé de Las Casas (1986: 329), and Diego Ortiz de Zúñiga (1795: 205)—agree on this date, the feast of the Ascension; other chroniclers such as Fernández de Oviedo (1959: 75), López de Gómara (1877: 172), and Martí de Viciana (1882: 274) also place his death in Valladolid, without specifying the day. However, this represents a limited set of testimonies of unequal value and independence, with several documentary verification problems (Arranz, 2006: 336-342; Castro Sánchez, 2020: 13-30).

Documentation from the last months of the Admiral's life, nevertheless, presents relevant discontinuities. Columbus arrived in Seville on November 7, 1504, severely ill (Colón; Varela, 1992b: 29), and from there conveyed to his son Diego the impossibility of traveling to see the monarchs (Colón et al., 1992a: 515-520); his last known letters continue to be dated in Seville at least until June 1505 (Colón et al., 1992a: 526-528), coinciding with descriptions of a man severely afflicted by gout and virtually immobilized (Madariaga, 1984: 481; Arranz, 2006: 326; Eliot Morison, 1992: 225; Irving, 1961: 305). Bartolomé de Las Casas (1986: 325) records a letter to King Ferdinand in which the Admiral promises to serve him for the few remaining days of his life.

A significant element is the assertion by Hernando Colón (1984: 349) that King Ferdinand the Catholic decided to leave Valladolid to personally receive his father due to the gravity of his condition—which would indicate that the Admiral had not yet arrived in the city. This reconstruction poses, furthermore, an unresolved practical difficulty: if Columbus was, as just noted, severely ill and virtually immobilized at least until June 1505, the version placing his death in Valladolid eleven months later presupposes a multi-week journey between two cities separated by more than 500 kilometers. No source examined—neither from family nor court circles—documents the circumstances, date, or reasons for this trip, nor explains how a man described as virtually incapacitated could have survived it. This alone does not rule out his arrival in Valladolid, but it constitutes a gap that traditional historiography has not addressed with the same rigor applied to other episodes.

Added to these difficulties are several documentary silences and contradictions. The *Anales Breves del Reinado de los Reyes Católicos* by Galíndez de Carvajal, which record the main deaths of the period, do not mention Columbus's death (Galíndez de Carvajal, 1953; Fernández Duro, 1890: 161), nor does Peter Martyr d'Anghiera in the letters he wrote from Valladolid during those very days (Winsor, 1892: 491); the death does not even appear in the city's municipal records (Arranz, 2006: 342). Later sources—Las Casas (1986: 329), Fernández de Oviedo (1959: 75), López de Gómara (1877: 172), and Serra Postius (1712: 95)—state that the body was moved to Seville, but none mention the three-year period during which, according to tradition, the remains were buried in Valladolid, a period for which no burial documentation survives either.

The origin of this tradition rests fundamentally on the *Historia del Almirante*, attributed to Hernando Colón, and the *Historia de las Indias* by Bartolomé de Las Casas—which largely depends on it. Antonio Rumeu de Armas (1970: 17-18) qualifies the former as one of the most controversial works in Columbian historiography: the original manuscript is lost, the first known edition is from Venice, 1571, in Italian translation, and the initial chapters likely constitute an apocryphal composition by unknown hands, while only the portion relating to the voyages can be attributed with reasonable safety to Hernando Colón (Rumeu de Armas, 1970: 22-26).

Finally, the date itself presents a chronological problem: both Hernando Colón and Las

Casas place the death on Ascension Day, but in 1506 this feast fell on May 21, not May 20 as traditional sources claim (Castro Sánchez, 2020: 27; Arranz, 2006: 336-337)—a discrepancy that, by itself, does not call into question the location or year of death, but does allow assessing the precision of textual transmission. Overall, Columbus's death in Valladolid in 1506 constitutes a plausible attribution supported by several testimonies, but certain details of the episode—the exact date, final circumstances, and independence of sources—present genuine verification problems.

5. BURIAL AND EARLY TRANSFERS

If documentation regarding Columbus's death features shaded areas, that of his burial and early transfers is no less shadowy: it is precisely here that some of the most significant contradictions of the traditional narrative emerge. The latter maintains that, after dying in Valladolid, the Admiral was buried in the Franciscan convent of San Francisco and that his remains stayed there until being transferred to Seville in 1509 (Ballesteros Beretta, 1945), but direct and contemporary documentary evidence confirming this is limited.

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everal authors—Giménez Fernández (1954: 14), Justin Winsor (1892: 491), Enrique Gandía (1951: 375)—have pointed out that no contemporary funerary register survives proving inhumation at the convent of San Francisco, and that much of the assertion relies on later traditions. The identification of the burial chapel is based on the *Extractos del Diario de los Verdesotos*, known through the publication by José Vargas Ponce, according to which Columbus was buried in the chapel of Luis de la Cerda (Castro Sánchez, 2020: 13-15); however, the original document has not survived and has reached us only through later transcriptions. Preserved documentation concerning the chapel does not, therefore, provide explicit and independent corroboration of the burial, although this silence does not invalidate it (Cuartero, 1963: 26; Castro Sánchez, 2020: 20-22).

According to the generally accepted version, the remains were subsequently transferred to the Carthusian monastery of Santa María de las Cuevas in Seville, but the chronology is not as clear as presented: Diego Ortiz de Zúñiga (1795: 205) places the transfer in 1506 itself, while other authors date it to 1509 (Ballesteros Beretta, 1945; Arranz, 2006). The discrepancy is not minor: if the transfer was immediate, the three-year period that historiography places in Valladolid disappears; if it took place in 1509, there remains a lack of conclusive documentation to trace the remains during the interval.

Another fundamental problem is the absence of any testamentary provision in which Columbus expresses a desire to be buried at Santa María de las Cuevas (Colón et al., 1992a: 534-536). Testimonies from descendants do not fully coincide either: in his 1539 will, Hernando Colón states that his father and his brother Diego had long been buried in the Sevillian monastery, whereas other contemporary documents suggest an earlier transfer, generating an unresolved chronological incompatibility.

The relative scarcity of Sevillian documentary references regarding the presence of the remains at the Carthusian monastery constitutes an additional limitation (Serra Pickman, 1992: 220-225), to which are added the edaphological observations addressed in section 7, which likewise do not allow, on their own, identifying the remains or refuting tradition (Castro Sánchez, 2020: 29).

The uncertainties regarding the initial burial, the lack of conclusive contemporary records, chronological discrepancies, and difficulties in documentarily reconstructing the early transfers prevent establishing a continuous historical chain of custody from the moment of Christopher Columbus's death.

6. SEVILLE – SANTO DOMINGO CONFLICT

The controversy over the location of Columbus's remains is one of the most persistent debates in Columbian historiography. Although discussions trace back to the 18th century, it acquired a new dimension with the discovery made at the Cathedral of Santo Domingo on September 10, 1877, when restoration works located a lead box containing human remains and an inscription interpreted as a direct reference to Columbus (Deive & García Arévalo, 2006: 21-22). The discovery called into question the traditional version according to which the remains had been transferred from Santo Domingo to Havana in 1795, following the Treaty of Basel, and to Seville in 1898 (Salva, 1899: 16-17): if those discovered in 1877 were truly Columbus's, those transferred by Spanish authorities could not correspond to him.

The Spanish response was swift: the Royal Academy of History commissioned a report from Manuel Colmeiro (1879), who defended the correctness of the 1795 exhumations and rejected the Dominican identification. The opposing position was articulated by Emiliano Tejera (1928), according to whom Spanish authorities had erroneously identified Columbus's grave and transferred the remains of another family member, probably his son Diego, while the authentic ones had remained in Santo Domingo until 1877.

Analysis of this debate reveals, however, a relevant methodological circumstance: both Spanish and Dominican theses share the presupposition that the remains located in one of the two sites effectively correspond to Columbus, and the discrepancy is limited to determining which identification is correct. Both possess documentary arguments, but both also depend on the correct identification of the remains in earlier phases of the funerary chain: the 1877 controversy and the discussion surrounding the 1795 exhumation cannot be detached, therefore, from the uncertainties regarding preceding burials and transfers.

7. SCIENTIFIC EVIDENCE

The limitations of historical documentation have prompted several researchers to seek an alternative route in experimental sciences: genetics, physical anthropology, and other

auxiliary disciplines as independent sources of evidence from documentary testimonies. The most prominent initiative is the project led by Professor José Antonio Lorente at the University of Granada, launched in 2003 to analyze the remains preserved in Seville and compare their DNA with that of other members of the Columbus family, particularly Hernando and Diego Colón (Harney, 2004).

Evaluating genetic evidence requires distinguishing between the existence of scientific analyses and the public availability of a sufficiently complete corpus of results for independent examination. Lorente published an exposition of genetic studies in 2007 according to which the comparison of mitochondrial DNA from the Seville bones with those attributed to Diego Colón yielded a favorable response to identification (Lorente, 2007). Subsequent statements presented publicly as definitive confirmation, especially those disseminated in 2024, have not been accompanied, as far as this research could determine, by a complete scientific publication allowing independent evaluation[3], which limits the ordinary mechanisms of scientific contrast and reproducibility.

An established biological relationship between samples constitutes favorable evidence, but its scope depends on the nature of the marker, the quality of recovered DNA—extremely low, according to the researchers themselves, due to the preservation state of the bones (Harney, 2004)—and, above all, the independent identification of reference individuals: genetic compatibility can corroborate a hypothesis, but does not automatically equal a nominal identification. As Guadalupe Chocano Higueras points out (2006: 710), available tests allow establishing biological relationships, but do not demonstrate in an absolute manner the historical identity of the analyzed individuals; even if genetic relationships are correct, it remains necessary to demonstrate documentarily that compared remains correspond to the historical persons to whom they are attributed.

Anthropological studies have also provided relevant information: osteological analyses determine sex, approximate age, and pathologies compatible with the state of health traditionally attributed to Columbus, among which a probable chronic gouty polyarthropathy (Maresma, 2017), consistent with correspondence and contemporary testimonies (Las Casas, 1986: 324-329). Edaphological studies by Rafael Delgado Calvo López and collaborators, for their part, detected in the dust associated with the remains characteristics that do not always coincide with direct soil burial, as well as metallic threads compatible with funerary garments of a certain category (Castro Sánchez, 2020: 29).

[3] The finding is based on the review of scientific literature and publicly accessible documentation located on the genetic project led by José Antonio Lorente and the remains attributed to Christopher Columbus. This review has made it possible to identify previous publications about the project and its results, including Lorente (2007), but not, as far as this research has been able to determine and with documentation available until July 2026, a subsequent scientific publication that sufficiently exposes the primary data, the markers analyzed, the protocols applied, the statistical criteria of interpretation and the results necessary to subject the most recent public claims about the identification of the remains to an evaluation independent This finding is not equivalent to demonstrating the absolute non-existence of any communication or technical document not located or publicly accessible, but rather delimits the state of the scientific documentation examined in this research.

The most interesting contributions for this research, however, come from so-called cross-disciplinary investigations: without targeting the remains directly, they allow cross-examining the consistency of the traditional narrative. Paleographic studies by Father Gabriel Maria Roura (1993: 6), deepened by Jesús Delgado (2012) using modern graphic analysis techniques, identify similarities between Columbian handwriting and the tradition of the Royal Catalan Chancery; linguistic and lexicometric studies by Lluís de Yzaguirre (2006: 17) point out that phonological interferences in Columbus's autograph writings are satisfactorily explained by a Catalan substrate. Considered individually, none of these investigations allows identifying specific remains, and their evidentiary impact on authentication is only indirect—they are not used here as identifying evidence, but as an element of contrast regarding the consistency of the historical profile attributed to the navigator. Their methodological relevance is, nevertheless, real: if structural components of Columbus's profile—such as native language—do not match the conventional biography, uncertainty affects not only the trajectory of the remains but also the historical characterization of the subject intended to be identified.

Overall, genetic, anthropological, edaphological, and forensic evidence has contributed to the knowledge of the remains attributed to Columbus, but has not resolved the question of their authenticity: it can provide compatibility and, under certain conditions, independent corroboration, but it does not replace historical criticism nor allow automatically establishing a nominal identification when the linkage of samples to historical figures depends on an incomplete documentary chain. The contribution of experimental sciences can only be valued, therefore, within a convergent analysis with documentary and material evidence.

8. DOCUMENTARY LIMITS AND CONSTRUCTION OF THE HISTORIOGRAPHICAL NARRATIVE

The difficulties surrounding the identification of the remains attributed to Christopher Columbus do not derive exclusively from the lack of conclusive material evidence, but also from the very nature of the documentation supporting the traditional narrative. The *Historia del Almirante*, attributed to Hernando Colón, is a paradigmatic example: despite being one of the most widely used sources in Columbian historiography, the original manuscript has not survived and its textual transmission has been a subject of debate for decades (Rumeu de Armas, 1970: 17-26), and Bartolomé de Las Casas's heavy reliance on it reinforces the need to critically evaluate its origin (Rumeu de Armas, 1970: 22-26). Similar problems appear regarding burial, early transfers, and subsequent certifications: on numerous occasions, researchers must work with late copies, partial transcriptions, or indirect references to documents now lost (Colón et al., 1992a: 535-538).

These circumstances do not constitute, in themselves, proof of documentary tampering—loss of documents is common in historical research—but the repetition of anomalies at especially significant moments of Columbian biography justifies distinguishing between the narrative sequence consolidated by historiographical tradition (death in Valladolid, burial in

San Francisco, transfer to Seville, to Santo Domingo, exhumation to Havana, and final return to Seville) and the effective degree of independent verification of each of its episodes, which is not uniform: some possess a more solid documentary base, while others depend on indirect testimonies, late copies, or inferences intended to bridge discontinuities.

To this intrinsic weakness of sources must be added a factor often absent from historiographical discussion on Columbus's death: all narrative accounts sustaining the traditional version—*Historia del Almirante* included, despite presenting itself as a family account written by the Admiral's own son—were committed to writing decades after the events, within the framework of a documentary control apparatus exercised by the Spanish Crown, sustained over generations, over all information concerning the New World, reinforced in the most serious cases with the death penalty for booksellers and book merchants (Peñarroya, 1997; Friede, 1959: 48). This control was not limited to official works: in 1571, the very year the *Historia del Almirante* was published in Venice, the original documents of Bartolomé de Las Casas—the other core source of the funerary account—passed into the hands of Royal Chronicler Juan López de Velasco, who kept them under secrecy until 1597 by virtue of a Royal Decree of 1579 prohibiting their consultation without special license (Friede, 1959: 58; Hanke, 1986: LIII). As Friede himself warns (1959: 45), manuscripts considered originals today may in reality be clean copies produced after censorship had removed uncomfortable portions, leaving no visible trace—a circumstance that further diminishes the independence and reliability attributable to a documentary corpus, including apparently family or private testimonies, which already presented serious transmission problems on its own.

This phenomenon acquires an additional dimension when considering the political context of Columbian documentary transmission: Columbian lawsuits (*Pleitos Colombinos*), jurisdictional disputes between the Crown and the Admiral's descendants, and the growing symbolic significance of Columbus's figure constitute relevant contexts for studying the production and selection of documentation (Arranz, 2006; Varela, 1992), although examined evidence does not permit establishing a direct causal relationship. The possibility of later processes of reinterpretation or documentary selection must remain, therefore, as a research hypothesis—not a demonstrated explanation—the verification of which would require specific studies on the genealogy of each document and the institutional contexts in which it was copied or mobilized.

From this perspective, the question of Columbus's remains transcends the strictly funerary problem and questions, in a broader sense, relevant aspects of the traditional biographical profile: as set forth in section 7 regarding Yzaguirre's studies (2006) on the Catalan substrate of autograph writings, if the conventional reconstruction of the figure presents uncertainties in structural matters such as native language or cultural training, the problem of authenticating the remains cannot be completely detached from the prior problem of historical identification of the subject, conditioning also the criteria by which documentary, anthropological, and genetic evidence is interpreted.

9. CONCLUSIONS

The objective of this research has been to evaluate the extent to which currently available evidence allows considering historically accredited the authenticity of the remains attributed to Christopher Columbus preserved in the Cathedral of Seville. As clear from the analysis performed, this does not imply denying that the remains could belong to the Admiral, but rather precisely delimiting the degree of certainty supported by the examined evidence.

The documentary reconstruction of the final years of life, death, burial, and successive transfers presents unequal solidity. Death in Valladolid in 1506 is widely accepted despite some verification problems; more significant for authentication are the discontinuities in early burials and transfers: the lack of contemporary records regarding initial inhumation, the chronological discrepancy between 1506 and 1509 for the transfer to Seville, and difficulties in documenting the remains' stay at Santa María de las Cuevas.

Critical examination of sources confirms, likewise, that traditional reconstruction relies on testimonies of unequal probative strength: some sources are close to events or agree with other evidence, while others display textual dependencies, late copies, or chronological discrepancies. This does not prove the narrative false, but compels distinguishing between the narrative coherence of the historiographical sequence and the independent verification of its component episodes.

Genetic, anthropological, and material evidence constitutes a relevant line of proof, but does not solve the authentication problem on its own: its identifying capacity depends on sample quality, the discriminating power of results, and especially the independent identification of reference individuals. A biological compatibility can reinforce a hypothesis, but does not equal a nominal identification if that latter condition has not been established through independent means. Added to this, for the most recent claims publicly presented as definitive confirmation, is the absence of a complete scientific publication allowing independent evaluation.

The joint confrontation of these lines of evidence constitutes the core finding of the research: they do not yet converge with sufficient independence and probative force to establish a reasonably secure linkage between the remains preserved in Seville and Christopher Columbus, but the existence of documentary testimonies, historical clues, and biological compatibilities prevents considering the attribution unfounded. The most accurate formulation under the current state of research is that traditional identification is plausible, but not sufficiently accredited.

This result forces a reconsideration of the terms of the controversy between Seville and Santo Domingo: before determining where the remains rest, it must be established whether they can be authenticated through an independent convergence of evidence. The question of location remains, therefore, methodologically subordinate to the prior problem of

identification.

The research points, moreover, to a broader difficulty: authentication of remains presupposes a sufficiently stable biographical referent against which to test evidence. In Columbus's case, controversies over origin, native language, and cultural formation indicate that this condition cannot be taken as fully resolved. Consequently, the problem is not limited to establishing whether the remains preserved in Seville belong to Columbus, but affects the solidity of the historical reconstruction of the subject intended to be identified, compelling a joint consideration of the critique of remains and the critique of the biographical narrative supporting their identification.

The primary contribution of this study consists, therefore, in applying this shift in the order of questions to the Columbian funerary sequence: the coherence of a consolidated historiographical narrative does not equal a verified chain of custody, and the repetition of a documentary tradition cannot substitute for the critical examination of the independence, transmission, and probative capacity of sources.

Future lines of research should prioritize locating and reviewing original documentation regarding early burials and transfers; studying the stemma and transmission of primary textual testimonies; prosopographical reconstruction of agents involved in exhumations and transfers; and critical review of the identification of reference genetic samples, whenever possible under transparent, reproducible, and independent protocols.

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The Mysterious Promoter of Columbus's First Printed Biography

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ABSTRACT

A series of irregularities surrounding the arrival at the Venice printing house of the original manuscript of Christopher Columbus's first biography, written more than thirty years earlier by his son Hernando, invites an investigation into the personality of the promoter of that princeps edition, the supposed Genoese patrician Baliano de Fornari.

The arbitrary spellings under which we find the Fornari family and individuals in their circle recorded, combined with the identification of a Balian de Forne as a trusted associate of the Columbus family in New World business ventures, compels us to question where the *Life of the Admiral* was actually intended to be printed, and whether the so-called Fornari or Forne could have been part of a Catalan family with documented presence in the America of that era.

1. INTRODUCTION AND OBJECTIVES

Forenisic science has demonstrated, through indisputable genetic evidence, that the discoverer of America was not Genoese, but belonged to "*the western Mediterranean arc*," that is, the coastal area of the Iberian Peninsula where Catalan is predominantly spoken (Lorente, 2007). This certainty authorizes us to present the hypothesis that Christopher Columbus was a Catalan navigator, and that as such he interacted predominantly with people from the same western Mediterranean arc.

Undoubtedly belonging to this region were Pere Bertran Margarit from the Empordà, the Valencians Bernat Boïl, Lluís de Santàngel, and Antoni de Torres or de la Torre, as well as the Catalan Jaume Ferrer de Blanes, to name the most well known. Thus, if we take into account that the true discoverer of America has been erroneously identified for centuries as a wool weaver from Genoa named Cristoforo Colombo, one may wonder whether perhaps, through an innocent mistake or in a fraudulent manner, other Catalan figures connected to the Columbus family also entered into Genoese identity.

Imprecision, irregularity, or error cannot be blithely normalized as a characteristic trait of 16th-century chronicles and records. For this reason, this paper aims, first, to raise reasonable

doubts regarding the identity of the supposed Genoese Baliano de Fornari and, second, to suggest the possibility that the Columbus family may have wanted to print the biography of Christopher Columbus written by his son Ferdinand on the other side of the Atlantic, in an attempt to escape the editorial control exercised by the Hispanic Royal Council on the Iberian Peninsula.

2. A MANUSCRIPT THAT PASSES THROUGH MANY HANDS... AND GETS LOST

According to a compilation of supposed "original and unpublished documents" edited by the Decurion of Genoa in 1823, the alleged Spanish manuscript by Ferdinand Columbus on the life of the discoverer of America was delivered by his nephew and heir Lluís Colón in 1568 in Genoa to the patrician Baliano de Fornari. The latter entrusted its edition to another patrician, Giambattista de Marini (Harrisse, 1871, 4), who had the work translated into Italian by Alfonso de Ulloa—an Extremaduran imprisoned in Venice—and it was finally printed at the publishing house of Francesco de Franceschi, with a preface by the mathematician Giuseppe Moletto.

The passage of the unfindable manuscript through the hands of Columbus, Fornari, Marini, Ulloa, Moletto, and Franceschi awakens initial suspicions upon verifying that Marini was already dead when he was supposed to have received the manuscript, and that the so-called Luis Colón had already been living in prison for ten years when he made the hypothetical delivery to the Genoese patrician Baliano de Fornari—the individual to whom the corrupt princeps edition of the *Life of the Admiral* was dedicated on April 25, 1571. Indeed, according to Harrisse, Luis Colón was imprisoned from 1558 until his death in Oran on February 3, 1572, so that in 1568 he could not travel to Genoa to deliver the manuscript (Harrisse, 1871, 9). Furthermore, Giovanni Battista de Marini, a Genoese patrician who served as senator of the city between 1543 and 1556, was already dead by 1568, given that he has been buried in the church of Santa Brígida alongside his wife since 1565 (Harrisse, 1871, 9-10). *"How could a man who had certainly already died in 1565 take charge of printing the book in 1568?"* (Harrisse, 1871, 10), asks the Columbian scholar.

The first and only mention of the existence of the Spanish original is read in the preface to the first known edition of the work, published in April 1571 in Venice, where G. Moletto writes to the so-called Fornari that "one should not doubt that the history is truthful. Nor doubt that it was written by the hand of the aforementioned illustrious Don Ferdinand" (Harrisse, 1871, 11). Why should these doubts be expressed?, asks Harrisse. And why does Moletto express them precisely to the man who delivered the manuscript and the assignment to his "deceased" supplier, Marini, and who therefore knew its origin and nature much better? (Harrisse, 1871, 11-12) There is no need to answer these questions to realize how fraud insinuates itself without shame or subtlety of any kind. Today, however, we will only attempt to ascertain who that Fornari might have been and what relationship he had with the Columbus family.

3. A LINEAGE OF MERCHANTS AND MONEYLENDERS WITH AN UNSTABLE SURNAME

The Fornari family appears very early in the 16th century in close connection with the royal house. In October 1518, they already figure alongside the Fuggers, Welsers, Grimaldos, and other moneylenders of Charles I as recipients of a payment on account for larger amounts they were due to receive (Alonso García, 2004, 191). In the early 1520s, the Crown leased them the revenues of Oran, with an additional privilege that allowed them to pay part of their debts in textile products, which facilitated the placement of their merchandise (Alonso García, 2004, 108). To suppose that the Fornari were once again holders of this lease in the year 1568, that this link with Oran allowed them to visit Luis Colón in his prison, and that he had on hand the Spanish manuscript of Ferdinand Columbus—ten years after entering his cell—to deliver it opportunely to the mysterious Baliano, requires of us an act of faith somewhat incompatible with scientific thinking.

One of the first things learned when tracing the Fornari is that they can just as easily be named in this manner as "Forne." Numerous references make this evident. David Alonso mentions Tomás de Forne and Agustí de Vivaldo as lenders of 30,000 ducats who, when making payment in Genoa (20,000) and Milan (10,000), originate from "Vivaldo" and "Fornari" (Alonso García, 2004, 539). Hugh Thomas, for his part, writes a variant in parentheses when stating that "Domingo de Fornari (Fornés) belonged to a Genoese family or association that had long been dedicated to slave trading of all kinds from Chios, but their activity in the Portuguese slave trade from Guinea as suppliers to the island of São Tomé was also notorious" (Thomas, 2006, 557). And almost immediately thereafter he says that "Agustí de Vivaldi (whom they sometimes called Ribaldo in Spain) was a man of similar background as Fornés" (Thomas, 2006, 557). In fewer than two lines, Thomas demonstrates to us that the man named "Vivaldo" by David Alonso was also recorded as "Vivaldi" or "Ribaldo," and the hispanist himself stipulates that Fornari was likewise known as "Fornés." And to add insult to injury, note 60 to chapter 28 refers us to the end of the book, where it clarifies that "the name appears at times as Forne, Fornes, or Fornis" (Thomas, 2006, 885). Thus, the variability of spelling admitted by all these surnames is amply demonstrated, and one suspects that these alterations took place not in the drafting of original documents—where the parties involved must have been very clear about their own names or those of the holders in whose name they signed—but rather during the period of re-writing, depending on the degree of Italianization or Castilianization of the character being fixed.

4. TRUSTED ASSOCIATES OF THE COLUMBUS FAMILY

Ferdinand (“Hernando”) Columbus proves to have had dealings with this allegedly Genoese lineage when, in a document dated in Seville on July 30, 1527, he acknowledges having received money through Tomás and Domingo de Forne, on behalf of Alonso de Ara, a servant of the Vicereine of the Indies—Ferdinand's sister-in-law—who auctioned off some

assets from the estate *"of the Admiral, my lord"* (Various authors, 1892, 99-100). That is to say, the Forne or Fornari, in addition to being slave traders, cloth merchants, Crown lenders, and merchants "residing at court" (Hernández Díaz and Muro Orejón, 1941, 25), were money changers and trusted intermediaries of the Columbus family. A 1894 edition of more Columbian documents transcribes the same news item, but now Domingo de Forne is called "Diego de Forne" (Various authors, 1894, 452). As can be seen, the scientific reliability of "official" documents hovers in a delicate balance between memorialistic satire and historiographical drama.

Now we are interested in knowing whether a Baliano de Forne ever existed. And we have found him, though without the final "o" and written as easily with a "**B**" as with a "**V**": *"Gold for the Countess of Gelves brought by Balián de Forne from Santo Domingo on the ship of Joan Enrríquez, master, in the year 1551"* (Hampe, 1988, 162). Here we have him expressed as Balián de Forne, transporting gold from Santo Domingo for the Countess of Gelves, who in 1551 was the widow of Count Jordi de Portugal, namely Isabel Colón de Toledo. A reference in an article by Ruth Pike clarifies that *"Valián de Forne was the representative in the New World of the company of Fernando Vázquez and Tomás and Domingo de Forne"* (Pike, 1962, 365), dated September 16, 1549, from which it is inferred that the said Valián must have been a relative of the two brothers partnering with Vázquez. References are multiple around this Valián or Balián in the mid-16th century, and almost always we see him handling gold, pearls, or money as an intermediary or manager for his associates.

If we turn to the Iberian Peninsula, we find in a work on the much-debated Catalan-Aragonese exclusion from the conquest of America that "on January 2, 1510, a license is registered in favor of Gabriel Forné, Catalan, resident of Ulldecona, merchant trader, with no record of prohibited status" (Pinya, 1990, 110). Yes, this is no error. A Catalan Forné. In the same volume, further on, we find confirmation in the "official" Spanish of the period: *"Gabriel Forne catalan vecino de Huydecona que es en Catalonia hijo de Gabriel Forne e Isabel Prada e dixo por quanto el queria pasar a las Indias en la nao de que es maestre Diego de Basusto nos pidio le diezemos licencia para ello"* (Pinya, 1990, 178). We knew of the case of this merchant from Ulldecona because he is said to have been the first known Catalan registered as a passenger to the Indies, but Iván Armenteros cites him as Gabriel Forn. The registration date is exact, January 2, 1510 (Armenteros, 2012, 255), and therefore it is the same Gabriel Forné mentioned by Romà Pinya. And he is called a "trader," we understand of slaves, which was the business of the "Genoese" Forne or Fornari in the early 16th century. Having arrived at this point, we propose that the so-called Baliano de Fornari could, in reality, be a merchant of a lineage originating from Ulldecona. Or perhaps not. But in any case, he could be a Catalan who acted for several years as a representative in Santo Domingo for the company of his ancestors Tomás and Domingo de Forné or Fornés.

Thus, if Tomás and Domingo de Forn, Forné, or Fornés—transformed into "Fornari" by the magic wand that turns into Genoese everything it touches—safeguarded money proceeding from the Admiral's estate for Ferdinand Columbus, and their relative Balián(o) transported gold for Isabel Colón, we can deduce that the Forne or Fornés family was the lineage in

which the Columbus family placed its trust to transfer considerable sums, precious metals, or shipments of the highest value from one side of the Atlantic to the other. Could it be possible that the so-called Baliano—*Valián, Valent,* who knows if *Valentí*—de Forné received the assignment to take the valuable manuscript of the *Life of the Admiral* to the New World in an attempt to print it there? Let us think about it.

5. FROM THE DECEASED GIAMBATTISTA DE MARINI TO A JUAN BAUTISTA FORNE

Around the mid-1550s, with the publication of the first Index of Prohibited Books (1551, expanded in 1554) and in a context of growing inquisitorial pressure, Forn or Forné would have received the confidential mission to edit in the Antilles or in Mexico, in Catalan and in Latin—we certainly do not believe in Italian—this definitive work on the true identity of the discoverer and his family. The official version states that he traveled to Venice and there delegated the assignment to a Genoese named Giambattista de Marini, a character, however, who if we believe was Genoese, Harrisse proves was already dead for years. Our research has allowed us, however, to find another Giambattista, curiously named Juan Baptista Furne.

In a statement from the year 1560 before the Holy Office, a supposed British hispanist (?) named Thomas Nichols writes the following: *"In the year of Our Lord 1556 my elders sent me entrusted to Gilermo Edge, then resident in Tenerife and their factor, so that I might learn the Spanish language; and being thus unseasoned, I stayed there three months and returned after three months to my land. Witnesses are master Domingos, Juna de Carminatis, Antonio Durantez, in whose house I lodged, and Juan Baptista Furne and Juan Antonio Botazo and Luis Leall"* (Cioranescu, 1963, 15).

This Thomas Nichols figures as the author of the translation of Francisco López de Gómara's work into English, in which the conqueror of Mexico is named "Prince": *The pleasant Historie of the Conquest of the Weast India, now called New Spayne, atchieved by the worthy Prince Hernando Cortes, Marques of the Valley of Huaxacac, most delectable to reade. Translated out of the Spanish tongue, by T. N. Anno 1578. Imprinted at London, by Henry Bynneman.* Gómara's work had come off the presses, allegedly in Spanish, in the year 1552, and by the following year it was already prohibited. Prince Philip, then in charge of the kingdom, signed the decree ordering its seizure, *"because it is not fitting that it be read";* and later, upon ascending the throne, he would reiterate it. Furthermore, there was a thorough tracking effort among booksellers to follow the trail of sold copies and confiscate them from buyers (Miralles, 2004, 556).

We see, then, a *Juan Baptista Furne* in the Canary Islands in 1556. A footnote provides a reference to the Inquisition where the witnesses cited by Nichols are located, and there we find Catalan surnames with ancient roots in the archipelago, now with their surnames corrupted. "Master Domingo Hernández had as a natural son Lázaro Hernández, married to Juana Joven de Carminatis, parents, among other children, of Pedro Carminatis Jovel,

precentor of the cathedral of Santiago del Otero, in the province of Tucumán, and of the licentiate Alonso Fernández Jovel, beneficed clergyman of the church of Remedios de La Laguna. Juan de Carminatis, father of the young wife of master Domingo, traded at that time with Santo Domingo, where he sold wines, above all; he was later Jurat of Tenerife (1565), and upon becoming a widower he took holy orders, around 1575. Antonio Dorantes, Nichols's host, was Genoese, exchange broker and merchant in La Laguna, married to Ginebra de Amonte, daughter of a Genoese physician. Juan Bautista Forne, also an exchange broker, died in La Laguna on July 21, 1573; he was already a 'sick and old man' when he resigned his office, on January 28, 1572" (Cioranescu, 1963, 87).

Iván Armenteros has extensively documented several Catalan families established since the end of the 15th century in the Canaries, which, needless to remind, constituted the last compulsory port of provisioning before making the Atlantic crossing to the New World. The woman mentioned as "Juana Joven Carminatis" appears to be a daughter of the Catalan lady Joana Jové i Font, herself daughter of Jaume Jové, jurat, councilor, and chief magistrate of Tenerife (Armenteros, 2012, 236), and of Olaia Font, daughter and sister of the Fonts, Catalan merchants established in the archipelago (Armenteros, 2012, 213-235). Joana Jové i Font married the Lombard merchant Giacomo de Carminatis (Armenteros, 2012, 237), and their descendants, as historiographical tradition dictates, pass into the books as Juana Joven or Alonso Fernández Jovel. The inconvenient Catalan identity has vanished.

We see that the aforementioned Juan Bautista Forne, then, is a sick and old man who resigns his office as exchange broker in 1572, and this is also reflected in the said Baliano de Fornari, who according to censorship was an 80-year-old man who in 1568 troubled himself to travel from Genoa to Venice (Harrisse, 1871, 11-12), and there left the publishing assignment for the Columbus manuscript to the non-existent, because deceased, Giambattista de Marini. We read "in a singular letter, with no place or year, addressed by Giuseppe Moletto to Baliano de Fornari," how the former says that the latter, *"having no regard for his age of LXXX years, nor for the season, nor for the length of the journey, came from Genoa to Venice with the intention of having the aforementioned book printed, both in the Spanish language in which it was written, as well as in Italian, and furthermore with the purpose of having it translated into Latin..."* (Harrisse, 1871, 11).

That is to say, Giuseppe Moletto explains to the said Baliano what Baliano himself assigned to the deceased Giambattista de Marini. This seems as strange as it is unnecessary. And of course, either the assignment took place well before the Genoese Marini died in 1565, or the patrician Baliano entrusted it to another Giambattista, perhaps a relative of his named Joan Baptista Forne who worked as an exchange broker in the Canaries, and who by age should be a brother or cousin of the said Baliano. The letter without place or date explaining the logistics of the assignment to the author of the assignment himself as if he were a third party ignorant of everything, with the names of people and places Italianized and with the proposal to print in Spanish, Italian, and Latin, then gives every appearance of being, not the message Moletto would write to Fornari, but information for the reader of the future. Information aiming to make clear that the work in question was written in Spanish, and that it was brought

from Genoa to Venice with great effort by an eighty-year-old Italian. And a G. Moletto who in the preface dedicated to Baliano de Fornari himself warned him that *"one should not doubt that the history is truthful. Nor doubt that it was written by the hand of the aforementioned illustrious Don Ferdinand."*

6. THE ATTEMPTED EDITION IN A CONTEXT OF PERSECUTION AND CENSORSHIP OVER BOOKS CONCERNING AMERICA

At the beginning of this paper, we saw the supposed original manuscript of Christopher Columbus's biography pass through a whole series of hands, among which stood out that of the manuscript's owner, heir to the Columbus family, who at the time of making the delivery was a prisoner of years in North Africa; that of the person in charge of taking it to be translated into Italian and Latin, Giambattista de Marini, who was already dead at the time of receiving the assignment; and that of the translator, the Spanish subject Alfonso de Ulloa, who was serving a sentence in the prisons of the Venetian inquisitors, spending his time making translations assigned to him to distract himself from captivity and from the tuberculosis that in a few years would bring him to the grave (Rumeu de Armas, 1973, 375-377). From the life ordeal of this unfortunate humanist in prison, several insights could be inferred for our case, but they would lengthen this exposition excessively.

Inasmuch as we have seen that Balián de Forne was a trusted figure who transported gold, pearls, and money on behalf of the Columbus family between the Antilles and the metropolis, we understand that the valuable merchandise delivered to him by the Columbus family would be the prized manuscript containing the true biography of the Admiral and discoverer of the Indies, to take it to the other side of the Atlantic, as the said Balian or Baliano was accustomed to do, with the idea of printing it in a workshop in the Americas. This attempt to escape Iberian censorship could be a consequence of the promulgation of the first Index of Prohibited Books in the year 1551, or perhaps of the definitive confiscation of the Ferdinand Library, which in 1552 would have come to be impounded in an inaccessible room of the Cathedral of Seville, according to the official version, or of the Barcelona See, more probably.

We know that on August 17, 1554, judicial proceedings were initiated against Luis Colón, who had been arrested and imprisoned under the charge of bigamy (Vallès, 2005, 9). History says that Ferdinand Columbus's heir remained under preventive detention in the castles of Arévalo, Medina del Campo, and Simancas, awaiting a final sentence that did not arrive until August 4, 1563, sentencing him to ten years of exile, the first five of which he was required to spend performing military service in Oran (Vallès, 2005, 11). On November 5, 1565, however, the sentence was reviewed to confirm that he must serve the ten years of exile in Oran, from where he would no longer move until his death in February 1572 (Harrisse, 1871, 9).

Regardless of whether or not we believe that judicial proceedings were initiated for bigamy,

or whether the arrest might have been motivated by the attempt to publish a Columbian biography far from the supervision of the Hispanic Royal Council, the fact is that after the imprisonment of Luis Colón in mid-1554, "by Royal Decree of September 21, 1556 (reinforced by that of August 14, 1560), the printing of books dealing with America without special license from the Council is explicitly prohibited, and orders are given to collect all those that were in circulation, transmitting them to the Council.

Severe penalties are imposed on booksellers who continue selling them; and by another [Decree], that of October 9 of the same year, royal officials in American ports are ordered to examine books arriving on ships, and not to allow prohibited books in the expurgatories of the Holy Inquisition to pass" (Friede, 1959, 48).

In this context of editorial control, prohibitions on printing books dealing with America, impoundments of manuscripts, and confiscation of works in circulation, it is highly surprising that, possessing Ferdinand Columbus's Spanish original, the book's publishers failed to print it in that language, as was the intention, and humanity has had to settle for the Italian translation of that unseen Spanish original as the princeps edition of the Admiral's biography.

The *Historie del S. D. Fernando Colombo. Nelle quali s'ha particolare et vera relatione dell'Ammiraglio D. Christoforo Colombo, suo padre* was published in Venice on April 25, 1571, "without indications or precedents of any kind, almost by surprise" (Rumeu de Armas, 1973, 30). Rumeu de Armas wonders how "this work, unknown and ignored in Spain, arrived in Venice," and notes that the "projected editions in Spanish and Latin were never carried out. As for the original manuscript, it was lost over time, without leaving any trace, nor of similar versions, in any library or collection in Spain or Italy" (Rumeu de Armas, 1973, 31).

7. FINAL CONSIDERATIONS

We are facing a masterstroke of censorship. The book that forever submerges the biography of the discoverer of America in a well of ambiguity and poverty of data is published only in Italian and abroad, written by his own son (stated explicitly in the title of the work), a formal guarantee of the truthfulness of the information. *"The success of the princeps edition was extraordinary, as it sold out in a short time. This explains why in two centuries eight new editions were launched in Italy, thanks to which the work attributed to Ferdinand Columbus became generally known to scholars and met with no less unanimous acceptance"* (Rumeu de Armas, 1973, 31).

To the Italian editions must be added the "French (1681), the two English (1704 and 1732), and the Spanish edition by Barcia (1749), *translated back into Spanish, as the original did not appear"* (Rumeu de Armas, 1973, 32). The rapid dissemination of the book globally spread the lie upon which much of the historical fraud rests that devalues, even today, the chronicle of the discovery of America and its protagonists.

If that Italian translation of 1571 had no problem with distribution, sale, and re-edition by the Royal Council of Philip II, it is because the book said what suited the Hispanic monarchy. The Venice edition, therefore, must be a publication arranged surreptitiously by the Royal Council itself. The fact that the original has never reappeared, combined with the severe prison sentences of the manuscript's owner and the translator—prisons from which neither would emerge alive—invites us to think that **a Spanish original never existed**.

How could the Columbian manuscript be lost, if the translation was being made inside an inquisitorial dungeon, guarded and watched over by relentless executioners? The unfortunate Ulloa must have translated into Italian from a pruned, crossed-out Catalan original, filled with corrections and with notes on interpolated pieces of paper. An unexhibitable manuscript, impresentable, in sum, and for that reason never found again. The Catalan original must have been intercepted by officials in American ports when arriving in the hands of the Canary exchange broker Joan Baptista Forn or Forné, who would have received it from his relative Balian(o) de Forne, the Columbus family's trusted man for high-value transactions with the New World.

The intention of Luis Colón, we understand, was to print the work in America without it being subjected to the control of Hispanic royal censorship, and to attempt to disseminate it in Europe from there, in the hope that the truth spread through other countries would constitute a bulwark from which to confront the manipulated history being cooked up in the Iberian kingdoms. It is evident that he did not succeed, and the attempt cost him first his freedom and then his life.

8. CONCLUSION

These considerations aside, there are documented facts that are indisputable. To begin with, we have verified that the Fornari were a trusted lineage of the Columbus family for transferring considerable sums, precious metals, or shipments of the highest value from one side of the Atlantic to the other. It also remains amply demonstrated that the surname Fornari admitted multiple variants when being written, variants such as Forne, Fornés, or Fornis, very similar to Catalan surnames.

Next, we saw how a trader from Ulldecona present in America in 1510 named Gabriel Forn appeared registered in certain records as Gabriel Forne. And immediately thereafter it became clear how the Catalan ancestry of certain prominent figures in the 16th-century Canaries was diluted through the transformation of the surname Jové into Joven or Jovel for their descendants.

The concatenation of these verified facts, reinforced by the changes of hands of the manuscript and the irregularities, already noted, detected throughout the editing process, allow us to suggest the high probability that the so-called Baliano de Fornari, the man who promoted the printing of Christopher Columbus's first biography, was a Catalan belonging

to the Forn family of Ulldecona, with the entire bundle of direct and indirect implications that would derive from this circumstance.

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The Discovery and Conquest of America

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ABSTRACT

This paper aims to demonstrate that it was Catalonia that carried out and was able to undertake the Discovery and Conquest of America, given that it possessed the means to do so, unlike the Kingdom of Castile.

1. INTRODUCTION AND OBJECTIVES

The objective of this study is to make a comparison between the Castilian and Catalan navies of the 15th and 16th centuries between both countries in order to deduce which of the two was capable of carrying out the Discovery and Conquest of America, as well as the economic impact of the American conquests on both territories. I will base my analysis on what I have published in my book *La conquesta catalana de Mèxic* (“The Catalan conquest of Mexico,” Camp, 2025).

2. WORK METHOD

Bearing in mind that the documentation that has reached us tells us that the Discovery and Conquest of America was carried out by Castilians in the name of the Kingdom of Castile, I will demonstrate here, using deduction and induction techniques, that this is not possible.

2.1 Problems in Historiography

Problems must be confronted, otherwise History does not advance. As the great 20th-century French historian Lucien Febvre (1878-1956), a benchmark in French historiography, already said: *"Posing a problem is, precisely, the beginning and the end of all history. Without problems there is no history."* How, then, should these problems be approached, where logic and reality, plausibility and verisimilitude stand against the documentary information that has reached us from that era?

2.2 Inductive and Abductive Reasoning

The English mathematician and clergyman Thomas Bayes (1701-1761), a fellow of the Royal Society, sought to study how to solve problems that initially might seem unsolvable.

His theorem, Bayes' Theorem, refers to the probability of an event occurring conditioned by the existence of another event. As consistent or plausible evidence accumulates, the degree of credibility of a given hypothesis is modified, reaching either a very high or a very low degree. Thus, Bayesian inference can be used to rule out or accept conflicting hypotheses: hypotheses with a very high degree of credibility must be accepted as true, and those with a very low degree of credibility must be rejected as false.

This type of reasoning, abduction, was already developed by Aristotle in his work *Prior Analytics* (II, 25). It is explained very well by Professor Eli de Gortari (1918-1991), a graduate in Engineering and doctor in Philosophy, Logic, and Philosophy of Science. He was very clear that any form of reasoning must lead to plausible and verisimilar conclusions. He explained that when a thesis is proposed—a solution to a given problem that lacks rigorous demonstration or experimental verification—it is essential to formulate an argument that makes the proposed thesis admissible, that is to say, logical, plausible, and verisimilar.

In his view, inference by abduction is the most common and simple form of plausible or argued reasoning. Abductive inferences are those inductive, transductive, or deductive inferences in which at least one of their premises is probable, plausible, or verisimilar. If so, the conclusion will also be probable, plausible, or believable.

In case of doubt, I will apply the reductionist method based on the principle of Ockham's (or Occam's) razor, attributed to the English Franciscan friar, scholastic philosopher, and theologian William of Ockham (1285-1349), according to which, all things being equal, the simplest solution is usually the most probable. This implies that when two theories under equal conditions produce the same consequences, the simpler theory is more likely to be correct than the more complex one.

For History, it is no problem at all and is fully acceptable, for instance, that the conquest of Mexico was carried out by the son of a poor peasant, or the son of a poor hidalgo who could not afford to maintain a horse; that it was led by a man for whom no formal studies worthy of the name have been proven, but who in reality possessed extensive knowledge of theology, spoke Latin elegantly and fluently, was an expert jurist, knew how to fight with all kinds of weapons on foot and on horseback, surrounded himself with luxury, **had refined tastes, and displayed a coat of arms bearing the emblem of the Counts of Barcelona.**

2.3 The Castilian Navy in the 15th and 16th Centuries

Seville had shipyards, but used them at a lower level than what we are told. The building that served as a shipyard in Muslim times is called *Las Atarazanas*.

Official historiography tells us that, on paper, these were very powerful shipyards, employing a large number of men and producing a great quantity of galleys. But it turns out that when the King of Castile decided to seize Tarifa in 1292, he required the help of foreign

fleets to achieve his objective. There was a long war from 1274 to 1344 between the Kingdom of Castile and the Kingdom of Granada, known as the War of the Strait, for control of this strategic location, and all the vital and indispensable naval operations of this war were carried out by Catalan, Genoese, and Portuguese fleets. James II sent one in 1292, another in 1309, Peter III another in 1338, and thirteen more between 1332 and 1344, all of them armed and paid for in Barcelona and/or Valencia.

In 1339, the Crown of Castile signed a pact with the Crown of Catalonia in which the latter committed to providing the naval forces for the War of the Strait—that is, Castile's war against the Kingdom of Granada for the control of Tarifa, or rather, the northern part of the Strait of Gibraltar. Controlling the peninsular side of the Strait—namely the cities and ports of Algeciras, Gibraltar, and Tarifa—was a shared objective for both Castile and Catalonia. Weakening the Muslim Kingdom of Granada by taking away this highly strategic location was always advantageous for both kingdoms. Portugal also assisted, as King Afonso IV of Portugal was the father-in-law of the then King of Castile, Alfonso XI, and certainly shared the same interest. Catalonia, as well as Genoa, was interested for the same reason, as it would open the doors of its trade toward the Atlantic, especially toward England and Flanders.

Historiography describes in very high-flown terms the creation of a Castilian royal fleet starting in the 13th century. However, when they had to face their first serious naval battle, they needed help from Genoa. A Genoese, Benedetto Zaccaria, commanded the Castilian fleet—composed entirely of Genoese vessels—and obtained victory over the Muslims on August 6, 1291.

The naval portion of this war was carried out by four fleets: the Castilian fleet, inefficient and inoperative, which achieved only defeats; and the Catalan, Genoese, and Portuguese fleets, these three being effective and victorious.

By the end of the 15th century, the Castilian fleet had not improved at all, and with the *Atarazanas* of Seville closed, the Catalan fleet was decisive in achieving the conquest of Granada in 1492. Ángel Luís de Santos summarizes this in his article in the newspaper *La Razón* on January 31, 2022, explaining that Galceran de Requesens, with his fleet composed of Catalan galleys, maintained a total blockade of the Granadan coast to prevent the arrival of reinforcements and supplies from North Africa, played an important role in the conquest of Málaga, and carried supplies to the conquering army.

Where was the supposedly powerful and brand-new Castilian fleet located in Andalusia that shortly thereafter would discover America and carry out its conquest? The answer is obvious: it existed only on papers manufactured by censors. Why did they need the Catalan fleet if they already possessed one so powerful? How could they carry out the conquest of the Canaries, the discovery of America, the first circumnavigation of the world, and the conquest of the Indies?

2.3.1 Naval Industry

It is very surprising that while historiography states that between 400 and 500 artisans worked at the *Atarazanas*—a colossal figure and therefore more than likely fabricated—and that they maintained great activity and enjoyed a complex, meticulous organization during the late 14th century and the first decades of the 15th, when it came to reality, these Sevillian shipyards were actually used during those decades to hold assemblies and various public festivities. They were also used as warehouses for war booty and as a place to keep prisoners of war. At times, they were used as an elite prison, such as to incarcerate supporters of Peter I the Cruel after a victory by Henry II in the Castilian Civil War of 1351–1369 for the possession of the Castilian throne.

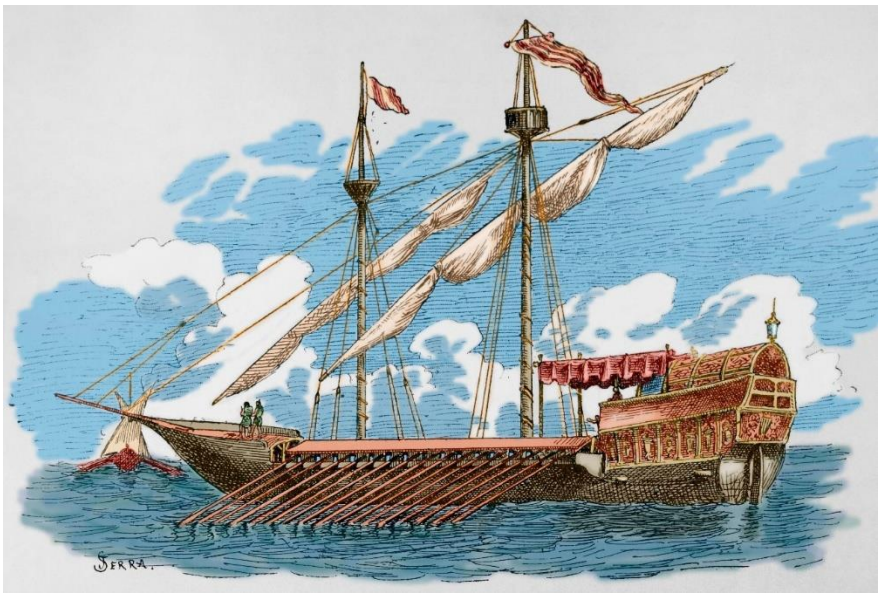

Fig. 1. *16th-century Catalan galley.*



Fig. 2. *The Atarazanas (Shipyards) of Seville.*

We are likewise told that in 1420 fifteen galleys were built there to fight in the war against

England, and an undetermined number to fight against Catalonia in 1430. Historiography ultimately acknowledges that after 1430 the Sevillian shipyards ceased to be used—if they had ever served much purpose, at least under Castilian rule—and around 1450 the hulls of some twenty galleys were rotting inside. Figure 1 shows a galley of those times, and Figure 2 shows the dimensions of the *Atarazanas* of Seville.



Fig. 3. *The Royal Shipyards (Drassanes Reials) of Barcelona.*

In 1493, the city's fish market was installed in the *Atarazanas*. Several fish stalls and a few dwellings were set up there. Throughout the 16th century, one nave was rented out as an oil warehouse and another as a wool warehouse. Another nave was rented as a warehouse for mercury coming from Almadén destined for the gold and silver mines of America. In 1587, three naves were occupied as the city's customhouse. The brand-new Warden (Alcaide) of the *Atarazanas* had no other task than organizing surveillance and collecting rent. Another nave was used until 1549 to manufacture bilge pumps. Throughout the 16th century, many naves were used as commercial warehouses. In 1552, a *Real Cédula* (Royal Decree) ordered that a large quantity of weapons always be kept in the *Atarazanas*. Plainly speaking: the *Atarazanas* of those times had all kinds of uses except building and repairing vessels.

In the Crown of Catalonia, things were radically different. Fig. 3 shows the dimensions of the Royal Shipyards *(Drassanes Reials)* of Barcelona. Not only were there shipyards in Barcelona, but there were also shipyards all along the coast of the Principality, the Kingdom of Valencia, the Northern Counties, and the Kingdom of Mallorca. There were numerous shipyards operating at full capacity during those times: Valencia, Castelló, Sant Feliu de

Guíxols, Mataró, etc.

The history of the Royal Shipyards of Barcelona is entirely different from that of the *Atarazanas* of Seville. From the 13th century until the end of the 17th century, they never stopped growing and expanding, while the Sevillian *Atarazanas* gradually languished and finally ceased operations in 1430, as mentioned above. The shipyards of Barcelona and other locations in the Principality and the Valencian Country grew increasingly powerful, coinciding first with the conquest of the Canaries in the 15th century and later with the discovery and conquest of America from the end of the 15th century through the late 16th century.

2.3.2 Naval Power

In the 15th century Catalonia—or rather the Crown of Catalonia—was the leading European power thanks to its dominion over the Mediterranean.

Indeed, King Alfonso IV of Catalonia, known as the Magnanimous (1396-1458), crowned king in 1416 upon the death of his father Ferdinand I, pursued the expansionist policy that his predecessors had carried out across the Mediterranean for two hundred years. In 1442, he succeeded in conquering the Kingdom of Naples, defeating the Italian powers: Florence, the Papacy, Venice, and their Neapolitan supporters.

The Magnanimous maintained aspirations over Corsica, continuing the Catalan-Genoese War and the struggle against the Ottomans. The Albanian leader Skanderbeg became Alfonso's vassal, and in 1451 the Catalan Bernat Vaquer occupied Krujë Castle, with Ramon d'Ortafà being sent there as Viceroy of Albania and subsequently named Viceroy of Greece and Slavonia, while Joan Claver became Viceroy of Epirus and Morea.

He was offered the crown of the Kingdom of Hungary by János Hunyadi and other Hungarian magnates. Admiral Bernat I de Vilamarí occupied and fortified the Greek island of Kastellorizo (Castellroig), operated at the mouth of the Nile, setting fire to enemy ships, and launched attacks along the Syrian coast, repeating the feat. Joan de Nava, a Castilian mariner in Alfonso's service, strived to establish a foothold in Cyprus.

2.3.3 Naval Technology and Legislation

As if all this were not enough, it should be noted that neither in Andalusia nor anywhere else in Castile were there cartographers, and without cartographers it is impossible to build maritime dominions, let alone such distant ones.

Regarding cosmographic and nautical science in 13th, 14th, and 15th century Castile, as Jordi Bilbeny explains, there never existed any cosmography workshop, nor has any nautical chart created by a Castilian been found during all this time. Manzano y Manzano highlights this when stating that *"it is a matter of wonder how great the penury and ignorance was*

regarding this throughout Castile at that time." Martínez Hidalgo likewise acknowledges this when stating that *"the production of sea charts rested almost exclusively in Mallorca* [meaning in the Crown of Catalonia] *and in Italy, giving rise to the schools bearing these names."*

Nor is there any record of pilot schools or any place where pilots could be trained. They had no nautical science, no trade halls (*llotges*), nor sea consulates. The first Castilian sea consulate was established in Burgos in 1494. Yes, of the sea, in Burgos, 155 km from the sea with the Cantabrian Mountains in between. Its purpose was simply to facilitate wool exports, mainly to Flanders, and the import of textiles and other products from Northern Europe. The second was in Bilbao in 1511, and the third in Seville in 1543, more than fifty years after the Discovery, and later than the conquests of Mexico and Peru.

Similarly, there is no record in the Castilian legal corpus of any maritime code or law regulating disputes derived from commercial activities at sea. The sea is an alien medium to man, and disputes arising from it can be very peculiar, distinct from those on land. Where maritime activity exists, a specific legal code to regulate it is essential, as possessed by the Crown of Catalonia with the *Llibre del Consolat de Mar* (Book of the Consulate of the Sea) from the 13th century—a compilation of various Catalan codes and others from around the Mediterranean—and the much older *Ordenacions de Rivera*. The *Llibre del Consolat de Mar* served as the foundation for maritime laws worldwide. The Italian maritime republics also had their own laws. In Castile, there was absolutely nothing of the kind during those times. The *privilegio consular* granted by the Catholic Monarchs to the merchants of Burgos on July 21, 1494, is considered the foundation of all commercial legal framework for Castile, as all Castilian maritime legislation is posterior and references this privilege.

Catalonia was the first country in Western Europe to use the **compass** and **astrolabe**, as confirmed by Alexander von Humboldt, and was a pioneer in drafting portolan charts and maps that were in fact true world maps. This German scholar also highlights that the great Catalan navigators Francesc Galí and Jaume Joan made an important voyage of exploration in the Pacific in the 16th century, specifically in 1585, travelling from the Philippines to Acapulco to test the operation of the declination instrument that Jaume Joan had invented.
Then there is the topic of maritime insurance. Maritime trade was very lucrative but also very risky, as three causes could lead to the loss of vessel, crew, and cargo: a mutiny, a pirate attack, or a storm. If vessel and cargo were not insured, there was a risk of losing everything. Therefore, maritime insurance is inherent and absolutely indispensable for the existence of maritime trade in a country, as was the case in Catalonia, the Valencian Country, the Balearic Islands, and the Italian maritime republics.

In the Kingdom of Castile, specifically in Seville, Antonio-Miguel Bernal asserts that such insurance was already being contracted in the 14th century. It is a pity, however, that this opinion has virtually zero documentary support, given that, as it was not compulsory to execute policies before a notary, none has survived—or at least that is the excuse offered. This is how Professor Casado views it, affirming that none are found until the second third

of the 16th century, and that they existed thanks to contact with Italian and Catalan merchants from whom they learned the practice—a natural development considering that the Maritime Insurance Ordinance of Barcelona dates from 1435. A surprised and astonished Bernal has to admit:

> *"Striking is the absence of testimony regarding maritime loans and exchanges in Castile when, by contrast, so many writings and provisions were devoted to land and fair exchanges. Scarcely can any news be traced in the various maritime regulations that have left specific echoes in legal texts and treatises. This is all the more significant as we have evidence that in Castilian ports, since at least the 15th century, they were known and used as preferred credit forms of which abundant testimony remains, as in the rest of Europe, in notarial archives."*

There was therefore no legislation or regulation of maritime trade, which implies that Castilian maritime trade was very scarce, and that all these types of maritime contracts—loans, exchanges, and insurance—did not begin to exist until well into the 16th century.

In the notarial archives of Seville, Cádiz, and the Canary Islands, practically no documentation on maritime insurance has come down to us; it is known only indirectly through mentions in certain lawsuits, where the documents certifying the insurance contract in question are never produced. Despite the exceptional documentary richness of 16th-century Andalusia and the Canaries, maritime insurance hardly ever appears. The excuse given is that, as notary registration was not mandatory, policies were not recorded anywhere, assuming they existed at all. It appears that trade intermediaries, the *corredores de lonja* (exchange brokers), had authorization to mediate insurance transactions starting as early as 1375.

That is, this insurance was negotiated by non-specialized individuals. From all this, it can be deduced that policies were practically never documented or put in writing before a notary, indicating a very low level of professionalism. It should also be emphasized that there could be no rigor since there were no ordinances regulating such activity. One must ask, therefore, whether this alleged insurance ever truly existed in a serious, orderly, and professional manner.

Although Bernal argues that by the late 15th and early 16th centuries a highly professionalized insurance market existed in Seville, it contributed almost nothing to the public treasury, indicating that it could not have been very substantial. Charles I twice ordered the establishment of an *escribanía de seguros* (insurance registry office) without ever being able to implement it. This registry office did not exist until 1556.

It can be concluded that these Sevillian maritime insurance policies did not truly exist until well into the 16th century, and of earlier ones there is virtually no record. This scarcity of documents is also evident in the case of Málaga, where the few found were drafted following

Sevillian customs and where most of the few contracts found were executed by Sevillians. It is worth noting that among all the examples presented, there is not a single case of trade with America.

Maritime insurance had developed in the Mediterranean since the 12th century in Catalonia and Italian commercial republics such as Genoa and Venice, among others. It seems that Castilians did not become aware of this vital instrument of maritime trade until the 14th century. And I say 'it seems that' because the arrival of insurance in Castile is surrounded by assumptions. As Professor Casado explains, when Castilian merchants encountered this instrument, what happened was:

> *"the arrival of insurance practice in Castilian territories, which very probably must have occurred in Seville around the second third of the 15th century. From Seville, plus Catalan, Valencian, and other native influences, it must have passed to Burgos."*

We see here expressions like *"very probably"* or *"must have"* used twice, making it clear that very little—or nothing—is known for certain, and that everything is conjecture. Until 1509, there is no record in the great merchant center of Burgos of a policy template, and it was not until January 26, 1514, that the first regulation incipiently governing these contracts was promulgated—the *Declaración de la póliza de seguros*—followed by new regulations in 1538, 1546, and 1572. Not until the new rules of 1538 was it made mandatory to keep a register book of all signed policies.

In my view, it is very surprising that where maritime insurance policies from Seville *are* found is in the register books of Burgos—a city where the corresponding taxes were paid, several weeks' journey from the Andalusian capital. It does not seem plausible that a Sevillian maritime trading expedition would remain paralyzed for more than two months while the insurance contract was drawn up and formalized in Burgos, 585 km away in a straight line and 707 km via modern roads. Given the means of transport of the era, these distances made the use of Burgos maritime insurance unviable in Seville or any other Andalusian port.

In the Kingdom of Castile, there was no legislation regulating these contracts, as mentioned above. The first law on this economic activity did not exist until January 26, 1514, when the Consulate of the Sea of Burgos promulgated the *declaración de póliza*, the first of a long list of laws regulating insurance. There is no proof, however, that this Burgos legislation was applied in Andalusia until the second half of the 16th century.

In Catalonia, these laws were promulgated throughout the 15th century, the first in 1432, followed by those of 1435, 1452, 1458, and 1461, all collected in the *Llibre del Consolat de Mar*.

There is an extremely meager number of maritime insurance policies contracted in Andalusia

in the 16th, 17th, and 18th centuries. As a sincere and baffled Bernal explains:

> *"Once navigation to the Indies commenced following Columbus's discovery of 1492, traffic with the American colonies experienced growing expansion during the 16th and 17th centuries, and from Cádiz in the 18th century. And yet, having reliable evidence of the progressive importance that transatlantic insurance would attain, there are scarcely more than sporadic, non-systematic references to it in the notarial archives of Andalusian cities."*

2.3.4 The Casa de Contratación of Seville

The Sevillian Consulate could not begin legislating until as late as 1543. The *Casa de Contratación* (House of Trade) of Seville was able to do so starting in 1503. But did such an institution exist in Seville during those years?

Jordi Bilbeny explains, basing his view on various authors, how in 16th-century Seville there could not have been a *Casa de Contratación*—neither for the Indies nor of any kind—given that such a House requires a Trade Hall (*Llotja*) from which to operate, a condition that did not exist in Seville but did exist in Barcelona and Valencia.

In Seville, there was no trade hall in the 15th century, and the 16th-century one was inaugurated in 1598. According to Jean-Paul Le Flem, Sevillian merchants *"received in 1582 the possibility of channeling their contracts through a trade hall, currently the headquarters of the General Archive of the Indies."*

According to Manuel Maestro, *"The Trade Hall of Seville was created in 1582, with identical powers to the Levantine [meaning Catalan] trade halls. In order to assist in the construction of its building—currently headquarters of the Archive of the Indies—it was granted a third of 1 percent of the value of goods entering or leaving the city. The building of the Trade Hall was completed in 1598."*

A consulate was created in Bilbao *"in 1511 as a rival to the Consulate of Burgos, instituted in 1494 by the Catholic Monarchs."* But the Sevillian trade hall was, as all experts have pointed out, created much later. According to Vicens Vives, the proposal submitted by Sevillian merchants to create a consulate *"was not approved until August 1543, when [the State] authorized said merchants to associate and form the Consulate or University of Shippers to the Indies."* And years later, *"the Sevillian merchants were granted the faculty of channeling their contracts through another institution of Mediterranean origin, namely the Trade Hall (Llotja). The trade hall of Seville was not an empirical reality until the end of the 16th century. Therefore, in conclusion, it could have had no direct relation with early American trade, simply because it did not exist."*

Everything seems to indicate that in 15th-century Seville some sort of brokers operated outside any trade hall, and surely without any professional or guild organization, because

Heredia has not even found their Ordinances. According to her, *"we do not believe Sevillian brokers ever came to draft Ordinances,"* because *"we, so far, despite our efforts, have not found them, nor even a reference to their existence in the documentation we have handled. When referring, in many documents, to the privileges and rights of brokers, the aforementioned Ordinances are never mentioned."* Nor does she reference throughout her study any document or contract drafted by a broker. Everything consists of laws, provisions, privileges. But the result of actual work by brokers is nowhere to be seen—just as if they had not existed in reality.

In Castile, neither trade halls nor exchange brokers existed, so when we observe in the account books of the *Casa de Contratación de las Indias* in the first decade of the 16th century that mention is made of a *"Martín Frías, exchange broker,"* who receives a brokerage fee of "0.5 percent" for 3,000 yards of linen, or reference to *"the exchange broker Alfonso de Quesada, for his brokerage of 0.5 percent on linens sold to Francisco de Medina Nunçibay,"* these events could never have taken place in Seville, because merchants were even exercising the same brokerage rights as Catalan exchange brokers, receiving the exact same rate of 0.5 percent.

Consequently, if the location where exchange brokers operate was inserted into the text by censors because there was no trade hall in Seville, we are standing before Catalan merchants whose names were altered, working in a Catalan trade hall.

Duran i Sanpere confirms that, starting March 26, 1396, the new ordinances of the Municipal Council of Barcelona "commanded that the tables set up by money changers in streets and squares be removed, and that all of them be brought inside the *Llotja de Mar*"; which he describes as an "open porch for contracting and displaying merchandise, equipped on the upper level with the Chamber of the Tribunal of the Consulate of the Sea. There operated the commercial jurisdiction, extending not only to local conflicts, but expanded to overseas consulates."

Accordingly, Joan Bassegoda, discussing the installation of the exchange table inside the *Llotja*, writes: *"Money changers, in order to retain money in their hands as long as possible, claimed to possess only small change and thus always had 48 hours between receiving money and returning the change. The Council of Thirty deliberated with the Council of One Hundred on this matter and created a commission tasked with resolving this troublesome affair. The regulations issued by this commission stipulated that money changers dismantle their stalls in the streets, especially in New and Old Money Changers Streets, and that a Exchange Table (Taula de Canvi) be established inside the Llotja building."*

We see, therefore, that a defining element of the *Llotja* was the exchange table. Furthermore, we are now aware that inside the *Llotja* of Barcelona was the House or Chamber of Trade (*Casa de Contractació*), headquarters for commercial operations. In conclusion: since the *Casa de Contractació* was, in the opinion of all experts, one of the fundamental institutions in the entire enterprise of trade with America, "ruling by itself the government of the Indies,"

with "the regulation of the first fruits of this Indian traffic"; but, conversely—and as we have just seen—it already existed in Barcelona, the city where the Catholic Monarchs organized the entire second Columbian expedition, and housed both the banking and exchange operations necessary to contract any commercial transaction related to sea cargo, it seems highly plausible that this *Casa de Contractació* could be none other than that of the Barcelona *Llotja*. Even Piernas Hurtado confirms that this Sevillian institution "was born as a Factory or Trade Hall" and was the "exclusive repository for trade with the Indies." An observation reinforced by María Antonia Colomar, who assures us that "according to the foundational ordinances of 1503, the *Casa de Contractació* was conceived originally as a factory, a privileged trade hall."

And now we know that the trade hall was precisely that: a house of commerce. That is, if the Sevillian *Casa de Contractació* was born as a trade hall, and born precisely as a trade hall similar to Barcelona's, then, since Barcelona's *Llotja* already contained a *Casa de Contractació*, the original *Casa de Contractació* must have been in Barcelona.

In Seville there could be no *Casa de Contratación* until the end of the 16th century, whereas in Barcelona it had existed since the end of the 14th century (Fig. 4).

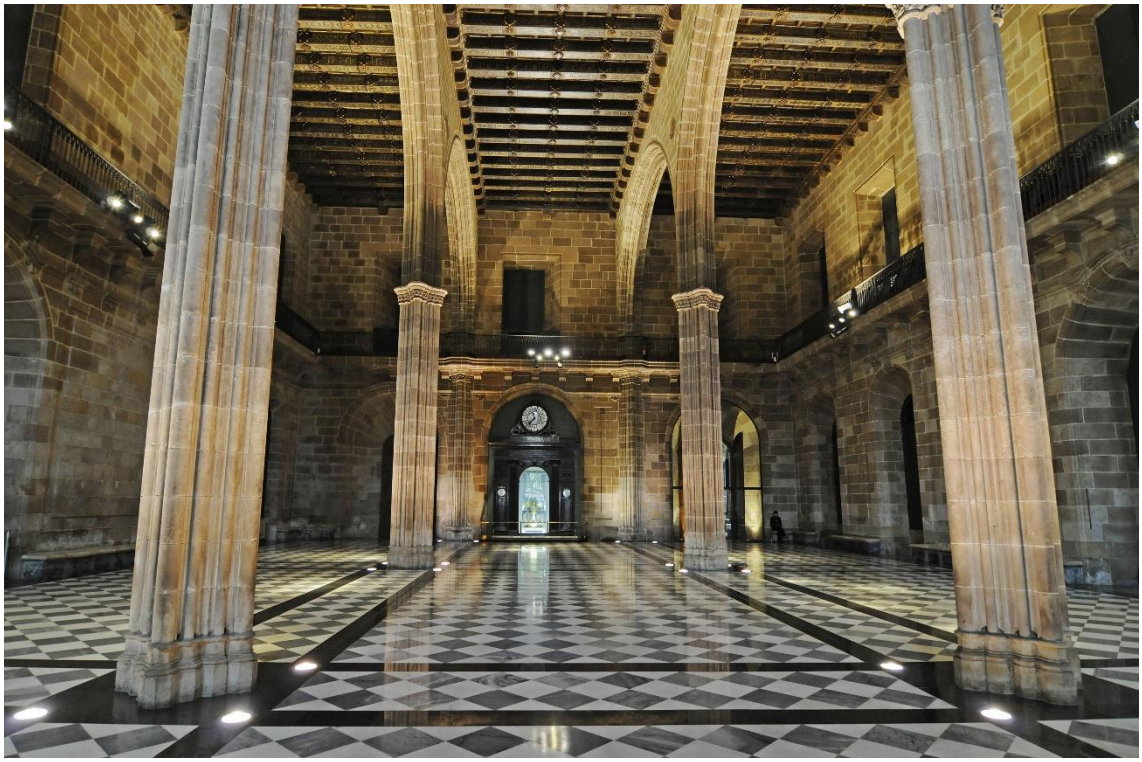

Fig. 4. *Trade Chamber (Casa de Contractació) of the Llotja of Barcelona.*

The *Casa de Contractació de les Índies* was born as a Trade Hall and Consulate, but since in Seville there was no consulate until 1543, nor a trade hall until the late 16th century, we are once again facing a 100% Catalan mercantile institution disguised as Andalusian in texts alone by royal censorship.

Thus it becomes clear that the *Casa de Contratación* of Seville did not exist until the 17th century, so everything produced and conducted around this institution did not happen in Seville, but in Barcelona.

2.4 Economy in the Crown of Catalonia and in Castile

From 1500 onward, the Northern Counties, the Principality of Catalonia, and the Kingdoms of Valencia and Aragon experienced an unprecedented economic boom.

The case of the Principality has been studied by Albert Garcia-Espuche, who, based on notarial records, certified this extraordinary and unprecedented economic expansion.

The most remarkable and unquestionable evidence of the great economic prosperity of this period is the massive immigration from Occitania that came to work and settle in Catalonia. A large number of people arrived, either with trades (masons, carpenters, tanners, shepherds, etc.) or unskilled individuals arriving to serve as labor. In addition, there was a vast amount of construction—both civil and ecclesiastical—during those decades, which I will not expand upon here as it would be too lengthy. Suffice it to mention, for example, the *Palau de la Generalitat*, the Barcelona Shipyards (the most important secular Gothic building in Europe), the parishes of the Vallès region, etc.

A significant example is the data on the origin of patients admitted to the Hospital de la Santa Creu in Barcelona, where, over a long period, Barcelonans and Catalans were a minority. Table 1 displays the data in percentages.

Period	Barcelona	Rest of Catalonia	Rest of Crown of Aragon	France	Castile	Italy	Others	Not stated
1474-5	**18.56**	40.93	9.58	4.63	9.81	2.67	1.56	12.26
1500	**14.60**	24.71	12.36	19.68	10.67	2.81	--	15.17
1539-40	1.88	18.39	5.64	**48.02**	6.81	2.11	1.41	15.74
1566	5.31	20.01	6.70	**48.64**	5.79	3.05	0.85	9.65
1581	6.64	32.61	9.07	**39.55**	4.57	2.96	1.13	3.47
1600	6.96	29.24	7.82	**37.08**	6.36	1.67	1.84	9.03
1620	10.80	37.62	9.45	**31.70**	2.35	1.30	0.67	6.09

Table 1. *Patients admitted to the Hospital de la Santa Creu of Barcelona by years/periods and nationality of patients in percentages.*

Little effort is required to visualize the movement of people, the bustle, and the overall economic explosion taking place during those times in the city of Barcelona and throughout the rest of the Principality and the Counties—an economic expansion truly without precedent. Other historians, such as Núria Sales, have found much more information on the massive presence of Occitans in the Principality. Since the studies by Jordi Nadal and Emili Giralt, numerous further studies have been conducted, all pointing to the same conclusion: the great importance of this Occitan immigration and its large volume during those decades.

Regarding the Valencia, a testimony states that in the city of Valencia alone in 1568 there

were about ten thousand Frenchmen—that is, Occitans—living there.

Within the period studied here, another testimony from a French ambassador in 1607 affirms that all farmers in the Kingdom of Valencia were either Moriscos or French, and a French scientist, Antoine de Montchrestien, stated in 1615 that in the Kingdom of Valencia, along the coast, lived thirty thousand Frenchmen—mostly Auvergnats, Gascons, Bearnese, and Limousins—not counting those living in interior districts.

I have been unable to find, even by reference, any study on possible Occitan immigration to the Kingdom of Mallorca, which is much less likely to have existed given that passage had to be paid to get there, and immigrants came on foot fleeing poverty. Very little research has been done, as all indications point to this immigration being very sparse there. It is known, for example, that Viceroy Don Diego de Sada, Secretary of the Council of Aragon, certified the absence of this phenomenon in the Balearics when stating in 1667 that *"on this island there are no Frenchmen, which is a miraculous thing; I do not believe there are more than four or five."*

This was not the case in the Kingdom of Aragon, which also received significant Occitan immigration during the period studied. This phenomenon has also attracted interest from historians, and there is sufficient literature studied that I will not seek out here, as it is not my objective. As a significant data point, an Inquisition report from Zaragoza states that in the year 1577 a fifth of the inhabitants or settlers of the Kingdom of Aragon were French—that is, Occitans.

It is fitting now to address this migratory phenomenon in Castile. Jordi Nadal and Emili Giralt were unable to find 16th-century figures for Castile, only 17th-century ones. In 1679-1680, the Marquis de Villars, using data received from various French Kingdom consuls, provided the following numbers of Frenchmen in this territory: 1,000 in Navarre, 16,000 in the two Castiles, 1,000 in Extremadura, Galicia, Asturias, and Cantabria, and 16,000 in Andalusia. These figures, however, are not reliable. Indeed, in 1674 in Andalusia there was a reprisal against the assets of subjects of French King Louis XIV. They located 87 in Seville, 45 in neighboring towns, 95 in Cádiz, and 161 in Sanlúcar. Nadal and Giralt acknowledge that these figures by no means justify the 16,000 reported by Villars. And the explanation that they fled earlier when the *Matrícula de franceses* (Register of Frenchmen) was conducted in 1637 is admitted by them to be by no means sufficient, besides the fact that most were proven to be engaged in commerce and were not all Occitans, but mostly Bretons and Normans.

If the Andalusian data are manifestly inflated, we can deduce that data for the rest of the territories of the Kingdom of Castile are also inflated, leading to the conclusion that Occitan immigration to the Kingdom of Castile was virtually non-existent.

The explanation for this massive Occitan immigration to the various territories of the Crown of Catalonia, composed basically of young men, was to replace the Catalans and Aragonese

who had emigrated to America, while simultaneously coming to work in a country undergoing a full economic boom, as mentioned above. The statement I have just made may seem surprising, but contemporary written accounts by French figures of high intellectual stature confirm it.

Thus Martinis records the lament of the Frenchman Gaspard de Saulx, Lord of Tavannes and Marshal of France, who, in his memoirs written in the mid-16th century and published in 1823, laments that the King of France does nothing to prevent the emigration of his subjects to Spain, making Spain—the great enemy of France at the time—even stronger and more powerful. Here is the English translation of this crucial text:

> *"There is another better way: nations do not flood or forcefully occupy, by sheer numbers, the country of their neighbors; it is a voluntary exchange, taking each other's place according to proximity: Spaniards go to the Indies, Frenchmen to Spain, Germans fill the empty places in France; deserted Spain makes few men. Ten thousand depart annually—Bretons, Gascons, and Auvergnats—who go to till the soil and serve in Spain, later becoming naturalized, giving Spaniards the opportunity to leave Spain and engage in wars. If the King hinders the departure of Frenchmen, and if lords and towns account for, register, and track their subjects, in a short time Spain will be dried of men and the Indies of Spaniards, forced to abandon war and the sea to till the lands of their own country."*

That is, emigration to the Indies had caused a shortage of men in Spain, who were replaced by Frenchmen, practically all Occitans. We have already seen which part of Spain received virtually all these immigrants: the continental states of the Crown of Catalonia. Thus it is concluded that it was from here that the majority of Spanish emigrants to America originated.

Antoine de Montchrestien explains it similarly. This man, protected by François Thésart, Baron de Tournebu and d'Essarts, had a very complete education and a remarkable literary career. He became owner of a foundry and wrote *Traité de l'économie politique*, the first known treatise on political economy. A man of this background wrote:

> *"...And in a short time the greater part of the inhabitants of Spain left, despopulating it for the Indies, so that there are so few men to work and wages are so high that we saw in Andalusia last year how part of the wheat was left in the fields due to the cost of harvesting..."*

Martínez Shaw clarifies that concerning Andalusian leadership there are all the doubts in the world, admitting:

> *"...on the other hand, the scarce influence of colonial traffic on the Andalusian economy is surprising...."*

He then notes:

> *"...all signs support a pessimistic interpretation, since capital did not flow into land (which remained essentially a symbol of social prestige), nor were cultivated lands substantially expanded, nor did significant changes occur in crop distribution, nor were imported New World plants acclimatized."*

In summary: **the economic impact on Andalusia of the conquest of America and trade with the Indies was nil.**

Further on, both prefacer Martínez Shaw and author García-Baquero, after noting that Andalusian agriculture felt no impact from trade with America, agree that the same applies to manufacturing, the most paradigmatic case being the shipbuilding industry: *"Existing data in this regard all coincide in pointing to a single, unequivocal reality: ... Our shipyards [the Castilian ones] appear to have been specialized almost exclusively in building small vessels of low tonnage, practically useless for crossing the Atlantic unless as dispatch boats* (avisos, small vessels used to transmit news)*."*

Philip II of Castile tried to have larger ships built in Andalusia, but in 1593 promulgated a pragmatic decree ordering that *"no registry for the Indies be granted to any ship manufactured on all the coasts of Seville, Sanlúcar, Cádiz, Puerto de Santa María, nor those of the County of Niebla, nor the marquisates of Gibraleón and Ayamonte."* In the same decree, such a drastic order was justified because:

> *"That experience has shown, with the loss of all ships that have navigated in said Route, the great drawbacks of building them there, because as the wood is Pine and they cut it green, and then assemble it without letting it cure, upon drying said wood easily casts off nails and loosens bolts, so that whatever weather hits these Ships, they immediately open up and are lost."*

In summary: King Philip II of Castile himself declares that Andalusians did not know how to build vessels of minimal quality to reach America intact.

That is, all naval expeditions setting out during the 15th and especially the 16th centuries could not have departed from Seville or any other Andalusian port, given that Andalusians of that era lacked a shipbuilding industry capable of long voyages.

Therefore, all supposed naval activity of Seville and its active trade with the Indies existed during those times on paper alone.

3. CONCLUSIONS

In view of the facts and the irrefutable, unquestionable reality described in this paper, and using the most advanced methods of logic, it is concluded that it is impossible for the Kingdom of Castile and Andalusia to have possessed in any way the slightest technological, human, and legislative capacity to carry out the Discovery and Conquest of the Canaries and America, quite unlike Catalonia, which possessed the most advanced technology, human potential, and legislation to undertake an enterprise of such dimensions and paramount importance in the History of Humanity.

NOTE:
This paper contained 85 footnotes (references indicating the year amnd the page) that have been deleted with the automatic translation with AI (Gemini). If you are really interested about the foonotes, please check the original in Catalan.

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The Catalan Footprint in American Iconography

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ABSTRACT

"Por Castilla y por León, nuevo mundo halló Colón" [For Castile and for Lion, Columbus found a new world]. With this famous Castilian saying that surrounded the coat of arms of Christopher Columbus in Francisco López de Gómara's *"Historia general de las Indias y conquista de México"* (General history of the Indies and conquest of Mexico, 1552), no doubts are left regarding the authors of the discovery. However, it does not quite fit with the other saying, also Castilian and referring to the Catholic Monarchs, which states: *"Tanto monta, monta tanto, Isabel como Fernando"* [As much as one is worth, so is the other, Isabella as Ferdinand].

If both held the same authority and power, why, according to official Spanish historiography, was the American enterprise carried out exclusively by Castilian-Leonese citizens, subjects of Queen Isabella I of Castile and León?

Were we Catalans not prepared for it? What if the background of the Catalans had lacked...

- Cartographic Schools and lineages of renowned cartographers such as the Cresques, the Olivas, Banet de Panades, Salvat de Pilestrina, the Prunes, the Rosells, Viladestes, Gabriel Vallseca, among many others; with their production centers in Barcelona, Mallorca, Messina, Naples, Valencia..., exporting this knowledge to other foreign nations.
- Or if Catalan Portolans or Nautical Charts had not existed.
- Nor Catalan cosmographers, astronomers, or mathematicians, nor the Mathematical Tables they left behind for us to calculate latitudes and longitudes.
- Nor Lineages of Admirals and/or renowned Catalan figures at sea, such as the Cardonas, Bernat de Vilamarí, Bernat II de Cabrera, Galzeran Marquet, the Requesens, Roger de Llúria, Conrad Llança, Ramon Marquet... and of course, a certain Christopher Columbus.
- Nor the *Llibre del Consolat de Mar* [Book of the Consulate of the Sea], foundation of current International Maritime Law, nor the Catalan Consulates (over a hundred throughout the Mediterranean and Europe)...
- Nor Shipyards like those of Barcelona, Blanes, El Grau in Valencia, Tarragona, Tortosa..., which built fishing, merchant, and war vessels of all kinds, such as *Busses*, Caravels, Cog-ships, Carracks, Small vessels/barkentines, Galleys (galleasses, galleys, and galiots), Galleons, Ships, Tarettes, Sagitties...

- Nor an entire supporting industry behind it that sustained all this prolific shipbuilding, with the necessary knowledge treasured by:
  - The guilds of master shipwrights and caulkers.
  - The artisan guilds such as carpenters, ropemakers, glassmakers, sailmakers, weavers... etc.
  - The vast quantity and variety of materials required for constructing these ships—up to 15 different types of wood, iron, bronze, copper, pitch, tar, hemp, cotton, varnishes, paints, etc.
- Nor the Catalan manufacture of Navigation Instruments (hourglasses, astrolabes, quadrants, Jacob's staffs), nor anything related to the arts of seafaring, nor any other aspect related to the sea where we Catalans were leading protagonists in the past...
- Nor the Catalan art of naval warfare with its strategies and tactics, nor the various armaments and weapons used by the Catalan navy, at a distance like crossbows, darts, arrows, containers with fire, containers with quicklime dust, iron bars, and stones... and in hand-to-hand combat like scythes, axes, cutting irons, hooks, spears, swords, and daggers, nor all the Catalan knowledge related to gunpowder as a weapon of war, such as bombards and cannons...
- Nor, therefore, any state policy in which the entire society participated—from the king, the courts, the military estate, to all the rest of Catalan civil society—in order to satisfy the creation and maintenance of a viable great navy...

On the contrary, if we did possess everything exposed above, why did we not participate in the greatest economic, logistical, and military enterprise of the era, such as *"The discovery, exploration, and conquest of the American continent"?*

Of course, the answer is given to us by official Spanish historiography. Since the Catalan background cannot be erased, the explanation they offer is that we Catalans fell into a deep well of decay and political, military, commercial, and cultural irrelevance, encompassing all aspects, without exception, of our society. Or perhaps there was a factor—that of the ruling power—which, to politically legitimate itself in its new position of power, needed to alter and therefore tamper with and rewrite history as it had actually occurred?

Unfortunately for these censors on the payroll of power, they not only had to destroy and rewrite history books under their new domains, but they also had to destroy those of neighboring nations, which often reflected a different history.

But as if that were not enough, much of the existing iconography of the era escaped their grasp—an iconography that, unfortunately for their new officialist narrative of history, graphically and irrefutably contradicted their new replacement historiographical discourse.

And that is what this paper is about: showing you images and more images so that readers and attendees at the symposium can evaluate the established official historiographical narrative by confronting it with the contemporary iconography of the era.

1. INTRODUCTION AND OBJECTIVES

"Por Castilla y por León, nuevo mundo halló Colón" [For Castile and for Lion, Columbus found a new world]. As we have already mentioned, with this iconic phrase official Spanish historiography summarizes for us the authorship of the kingdom that was unambiguously the protagonist of the discovery and conquest of the American continent.

And what about us Catalans? Where do we Catalans stand in this pivotal chapter of history? Well, we are not there, and when we are, we appear tangentially or residually, and always disguised, undervalued, and diluted within the political entity of the Crown of Aragon.

In this symposium, I will iconographically refute the omnipresent and unidirectional official Castilian historical narrative of the American enterprise by confronting it with the overwhelming iconographical presence of the Catalan navy, present in all contemporary graphic documentation of the era, in addition to the presence of the Catalan mark of possession in European cartography of the 16th and 17th centuries, which contradict the official Castilian historical narrative to unsuspected limits.

I will unequivocally demonstrate the presence of the Catalan nations, and therefore of Catalans, in the discovery, exploration, and conquest of the American continent. All of this through historical graphic documentation contemporary to the American events, deposited in leading museums and archives around the world, with images grouped into four sections.

2. IMAGES

The main section of my presentation is visual and self-descriptive. I provide 265 images structured into four sections. In the written text, naturally, I only include one sample image per section. In the presentation of the paper I will be able to show more, but it will always be a small sample relative to the 265 total images, due to time constraints. Many of these images are included in my book (Guillot, 2012), the cover of which is shown in Fig. 1.

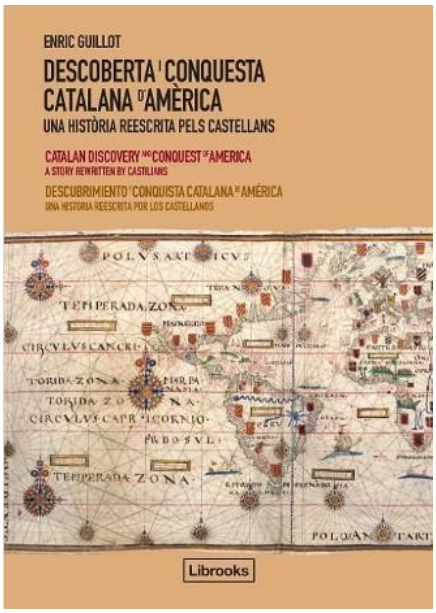

Fig. 1. *Catalan Discovery and Conquest of America (Guillot, 2012).*

2.1. Christopher Columbus's Ship

On this topic, I provide 15 images. I only include one sample in the written paper (Fig. 2a), which is the only contemporary image of Columbus that we possess. Fig. 2b simply enlarges Christopher Columbus's ship.

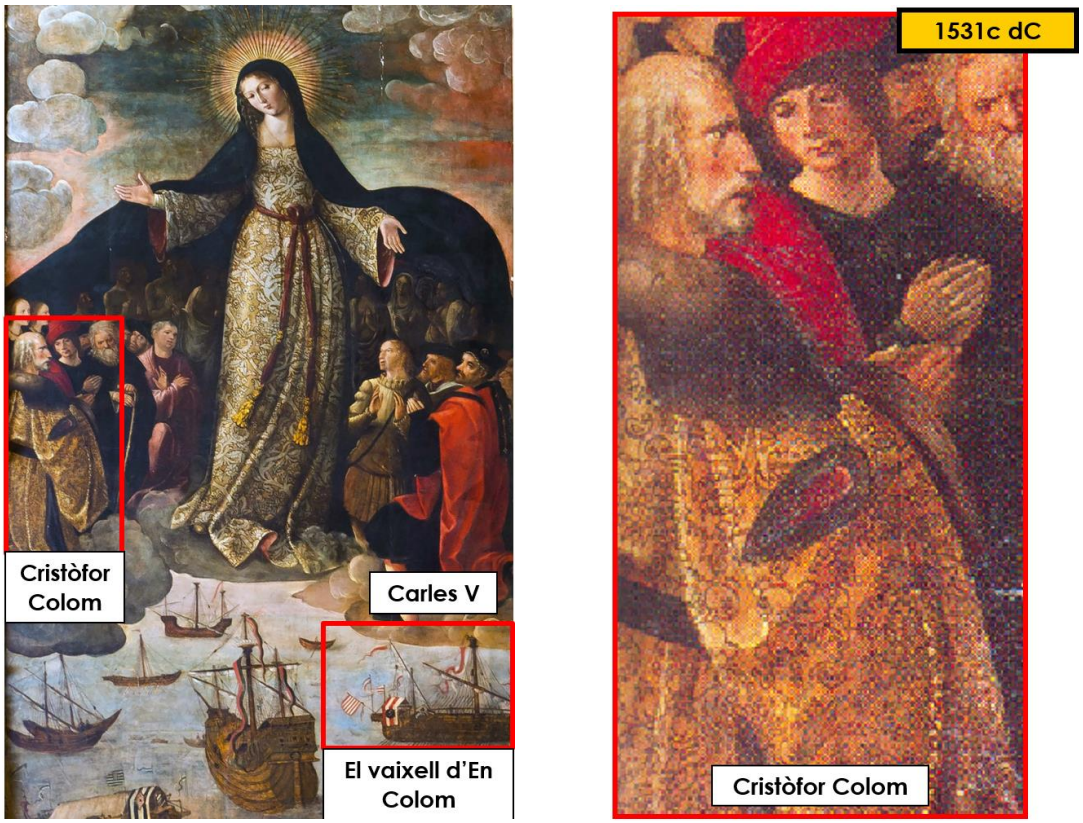

Fig. 2a. *Altarpiece of the Virgin of the Navigators, Alejo Fernández, 1531. [© Reales Alcázares de Sevilla]*

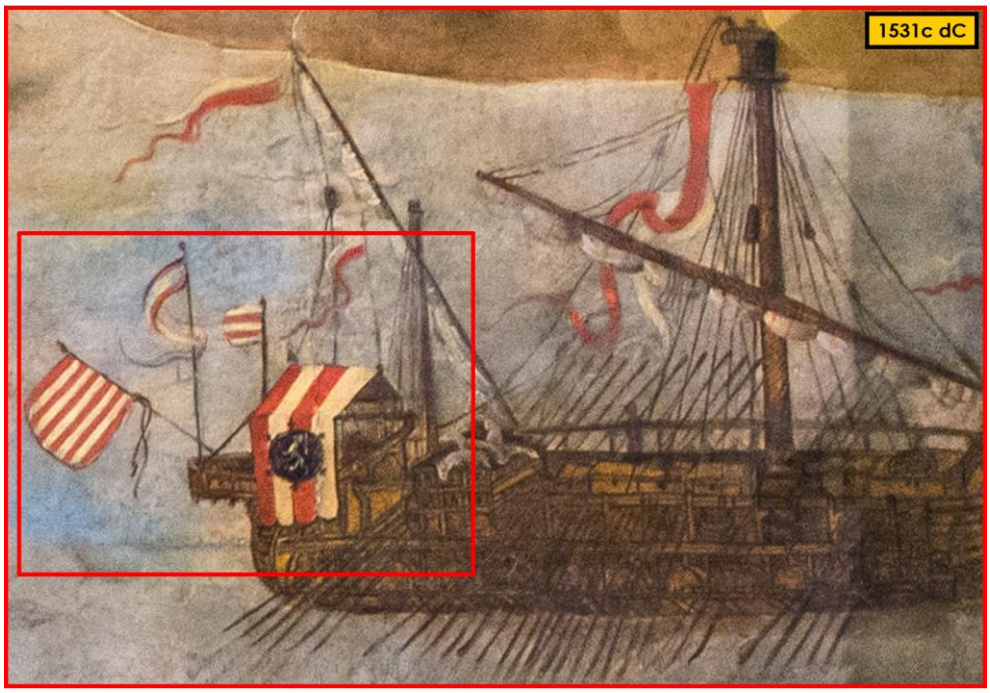

Fig. 2b. *Altarpiece of the Virgin of the Navigators (detail).*

2.2. The Shipyards of Barcelona

On this topic, I provide 8 images. I only include one sample in the written paper (Fig. 3), the *Civitates Orbis Terrarum*, Barcelona, Georg Braun and Franz Hogenberg (1572), based on the original 1535 engraving by Jan Cornelisz Vermeyen (© Universitätsbibliothek Heidelberg, Germany, *Beschreibung und Contrafactur der vornembster Stät der Welt* [Volume 1] Cologne, 1582).



Fig. 3. *Civitates Orbis Terrarum, Barcelona, Georg Braun and Franz Hogenberg (1572).*

2.3. The Catalan Flag Flying on Vessels of the Catalan Navy

On this topic, I provide 143 images from 102 different works, where 382 *senyeres* [Catalan flags] can be seen. I only include one sample in the written paper (Fig. 4), the Strait of Magellan by Joan Oliva (1614) [© Fundació Bartomeu March Servera, eighth map of the work]. Several more can be found in my presentation at **www.simposicolom.cat**.

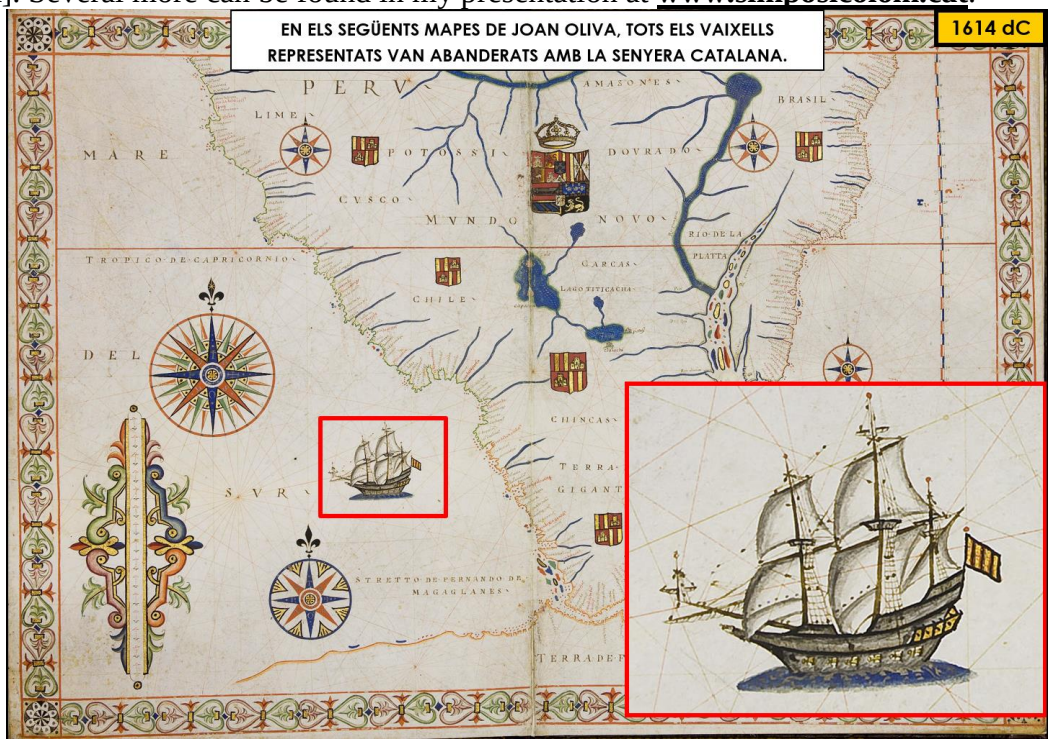

Fig. 4. *Strait of Magellan by Joan Oliva (1614).*

2.4. The Catalan Emblem in Shields and Possession Flags in American Territories

I provide 99 cartographic works. Fig. 5 shows Domingos Teixeira's planisphere (1573), perhaps the most popular: a triple foreign connection (drawn by a Portuguese, printed in Flanders, and preserved at the National Library of France) enabled its survival.

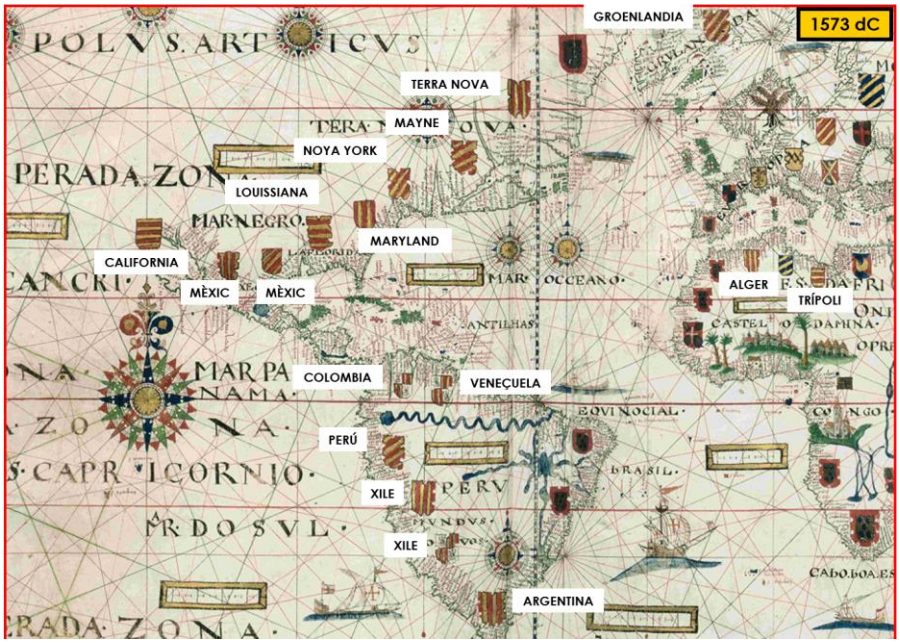

Fig. 5. *Domingos Teixeira (1573) Nautical planisphere.*
(© Bibliothèque Nationale de France, Paris)

In the list of iconographic references, I highlight in **bold** the maps with the Catalan heraldic emblem censored, repainted, touched up, and/or tampered with. In Fig. 6 (only a sample), some red bars have been repainted in blue or some quarters painted dark.

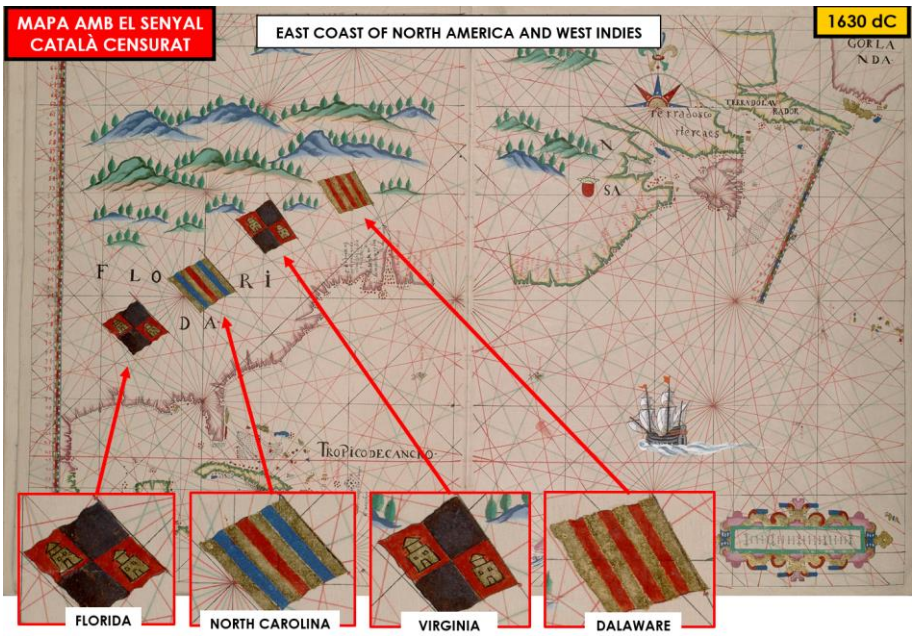

Fig. 6. *1630: East coast of North America and West Indies, Anonymous (1630).*
(© Henry E. Huntington Library)

3. CONCLUSIONS

Let us recall now that famous Castilian saying: *"Por Castilla y por León, nuevo mundo halló Colón"* [For Castile and for Leon, Columbus found a new world]... From what we have been able to observe, it appears that this saying is nothing more than the result of a self-serving and biased historiographical construct designed to legitimize, strengthen, and consolidate the Castilian nation politically, economically, and socially as the creative core of the Spanish nation and therefore of its Spanishness.

History is based on and supported by historical texts: why is all the contemporary iconography accompanying this written historiographical documentation ignored or disregarded? Iconography speaks, and often with much greater force and clarity than the written texts it accompanies. Why, then, is all this iconography not incorporated into the official Spanish historiographical narrative? What is the problem with admitting the undeniable leadership of the Catalan nations in the creation and growth of what we now know as the "Spanish Empire"?

I only hope that with this small iconographic sample you have been able to observe and verify the immense magnitude of our illustrious maritime history, so ignored, disregarded, hidden, when not distorted...

REFERENCE IN BOOK FORMAT

Guillot, Enric (2012) *Descoberta i conquesta catalana d'Amèrica. Una història reescrita pels castellans* [Catalan Discovery and Conquest of America: A History Rewritten by Castilians]. In three languages: Catalan, Spanish and English. Librooks.

SUMMARY OF THE FIGURES PROVIDED, LISTED AND IDENTIFIED WITH PRECISION IN THE APPENDICES THAT FOLLOW:

1. CHRISTOPHER COLUMBUS' SHIP = 15 FIGURES.
2. THE SHIPYARDS (DRASSANES) OF BARCELONA = 8 FIGURES.
3. THE CATALAN FLAG ON THE SHIPS OF THE NAVY = 143 FIGURES.
4. THE CATALAN SIGN ON THE COAT AND FLAGS OF CATALAN POSSESSION IN THE AMERICAN TERRITORIES = 99 FIGURES.
OUT OF THE 99 FIGURES, 40 (40%) WITH THE CALLAN HERALDIC SIGN CENSORED, REPAINTED, RETOUCHED AND/OR ADULTERATED.

NOTE: The Symposium web **www.simposicolom.cat** includes the Proceedings books in Catalan, Spanish, English and Italian, and the presentations. The presentation of Enric Guillot includes many figures, but necessarily less than the **265** listed in the Annexes.

ICONOGRAPHIC REFERENCES / INDEXES

1. CHRISTOPHER COLUMBUS'S SHIP

1. *1486: Nau catalana en el port de Rodes, a l'obra "Peregrinatio in terram Sanctam" de Bernhard von Breydenbach i el pintor Erhard Reuwick, [© Biblioteca Universitaria de Barcelona, 07-INC-175, fol. 48] i a la [© Biblioteque National de France RES-O2F-22].*
2. *1483-84: Nau catalana en el port de Rodes, "Peregrinatio in Terram Sanctam" de Bernhard von Breydenbach i el pintor Erhard Reuwick , [© The Smithsonian's National Museum of Natural History and National Museum of American History, ID: 93-8642].*
3. *1994: Edició «De Insulis nuper in mari Indico repertis» (Sobre les illes descobertes recentment al mar l'Índic), Johann Bergmann de Olpe, Basilea, Alemanya, (foli 1), conservada a la Universitat alemanya de Mannheim. [© Lilly Library call number: Basel, 1494 DP302.G58 V3].*
4. *1531c: Retaule de la Verge dels navegants, Alejo Fernández, [© Reales Alcazares de Sevilla].*
5. *1492: Globus de Martin Behaims, alemany, [© Germanisches Nationalmuseum, Nuremberg BBEH008].*
6. *1492: Globus de Martin Behaims, alemany, [© Germanisches Nationalmuseum, Nuremberg BBEH008].*
7. *1527: World Map, Vesconte Maggiolo, Perdut a la 2a guerra Mundial, [© Biblioteca Ambrosiana, Milan, Italy].*
8. *1559: Americae, Theodore de Bry, [© Bibliothèque Nationale de France GE FF 8185 RES].*
9. *1564-77: Còdex Florentino, Historia general de las cosas de Nueva España. [© BNCF-Biblioteca Nazionale Centrale Firenze, Ms. Med. Pal. 220, c. 415v].*
10. *1572: Còdex Misantla, [© Museu d'Antropologia de Xalapa].*
11. *1579: Espies de Moctezuma observen les naus de Grijalba, Diego Duran, Còdex duran o Historia de las Indias de Nueva España e Islas de Tierra Firme [© Biblioteca Nacional de España, Madrid, Vitr/26/11, foli 202].*
12. *Representació de l'arribada de Ferran Cortés i la seva tropa a la ciutat de Veracruz. [© The Library of Congress, Jay I. Kislak Collection Rare Book and Special Collections Division (91)].*
13. *1601: Historia General de los Hechos de los Castellanos en las islas i tierra firme del mar océano, Antonio de Herrera y Tordesillas, [© Archivo General de Indias, Sevilla, id: L.A.S. XVII-21/1 y /2].*
14. *1728: El almirante Christoval Colon descubre la Isla Española, ij haze poner una Cruz, Pieter Balthazar Bouttats, [© Library of Congress, Washington Illus. In E141 .H583 (Rare Book, Pieter Balthazar Bouttats RR].*
15. *1924-29: Sargas del descubrimiento, Gustavo Bacarisas, , [© Real Alcázar de Sevilla, Sala de las Bóvedas].*

2. THE SHIPYARDS OF BARCELONA (DRASSANES REIALS DE BARCELONA)

1. *1546-50: The emperor mustering his troops at Barcelona, Jan Cornelisz Vermeyen i Willem Pannemaker, [© Kunsthistorisches Museum Wien, Gemäldegalerie, 2043, GG_2038_VIS]*.
2. *1563 (3 imatges): Vista de Barcelona, Anthonis van den Wyngaerde, [© Österreichische Nationalbibliothek, Viena, prestatge de miniatures del Dipòsit 2, Manuscrit; II+79+1]*.
3. *1572: Civitates Orbis Terrarum, Barcelona, Georg Braun y Franz Hogenberg, basat en el gravat original del 1535 de Jan Cornelisz Vermeyen, [© Universitätsbibliothek Heidelberg, Alemania, Beschreibung vnd Contrafactur der vornembster Stät der Welt (Band 1) Köln, 1582 [VD16 B 7188]]*.
4. *1623-31: In Foedera Quædam Nostrorum Temporum, Barcelona in Hispania, Joris Hoefnagel (flamenc).*
5. *1634: Barcelona, Atlas Planeta Rey, La Descripción de España y de las costes y puertos de sus reinos de Pedro Teixeira Alvernas, [© Biblioteca Nacional de Madrid, British Library, Biblioteca Nacional de Viena, pàgina 96]*.
6. *1668-69: Vista de Barcelona, Viaje de Cosme de Médicis por España y Portugal. Laminas, Pier Maria Baldi, [Biblioteca Medicea Laurenziana Florencia, Med. Pal. 123, 1.]*.
7. *1695: Vista de Barcelona Capital de Catalunya, Panorama de Barcelona Nicolas de Fer.*
8. *1696: Veue ou profil de Barcelone, capitale de Catalogne, Nicolas de Fer, [Biblioteque national de France, département Cartes et plans, GE SH 18 PF 68 DIV 1 P 15 D]*.

3. THE CATALAN FLAG FLYING ON VESSELS OF THE CATALAN NAVY (102 WORKS, 143 IMAGES WITH 382 CATALAN FLAGS)

1. *XIII: Conquesta de Mallorca per Jaume I, Anònim mallorquí: Retaule de Santa Úrsula d'Artà, [© Convent de Sant Francesc, Palma de Mallorca]*.
2. *1348-1410: Arribada de la flota de Pere "El Gran" a Palerm on serà coronat Rei de Sicília el 30 d'Agost de 1282", Cronica Figurata di Giovanni Villani. [© Biblioteca Apostolica Vaticana, Manuscript - Chig.L.VIII.296, fol 127r]*.
3. *1348-1410: "Carles d'Anjou, Príncep de Salerm, derrotat i capturat per Roger de Llúria l'any 1284, Crònica Figurata di Giovanni Villani. [© Biblioteca Apostolica Vaticana, Manuscript - Chig.L.VIII.296, fol 134r]*.
4. *1348-1410: "Els aragonesos destrueixen la flota francesa", Cronica Figurata di Giovanni Villani. [© Biblioteca Apostolica Vaticana, Manuscript - Chig.L.VIII.296, fol 138r]*.
5. *1348-1410: "Jaume d'Aragó i Roger de Llúria en la derrota de Sicília de la batalla del Cap d'Orlando de l'any 1299", Crònica Figurata di Giovanni Villani. [© Biblioteca Apostolica Vaticana, Manuscript - Chig.L.VIII.296, fol 160v]*.
6. *1348-1410: Sense descripció, Crònica Figurata di Giovanni Villani, [© Biblioteca Apostolica Vaticana, Manuscript - Chig.L.VIII.296, fol 229v]*.
7. *1367: Pizzigano's Chart, Domenico i Francesco Pizzigani, [© Biblioteca Palatina, Parma, BP, ms. Parm. 1612]*.
8. *1375: Atles Català, Abraham Cresques, [© Bibliothèque nationale de France, Département des manuscrits, Espagnol 30]*.
9. *1413: Carte marine de l'océan Atlantique ... Mecià de Viladestes, [© Bibliothèque national de France, Rés. Ge. AA566]*.
10. *1400-50: Plat de Ceràmica, [© The Trustees of the British Museum, Museum number, G.517]*.
11. *1457c: Flota d'Alfons el Magnànim, Hesperis, Basinio de Parma i Giovanni di Bartolo, [© Bibliothèque nationale de France. Ms-630, foli 15v]*.
12. *1457c: Combat a l'entorn de Piombino, Hesperis, Basinio de Parma i Giovanni di Bartolo, Giovanni di Bartolo Bettini da Fano, (dibuixant), [© Bibliothèque nationale de France. Ms-630, foli 26r]*.
13. *1457c: Asedi a la Torre de Vada, Hesperis, Basinio de Parma i Giovanni di Bartolo, [© Bibliothèque nationale de France. Ms-630, foli 112v]*.
14. *1457c: Destrucció de la Torre de Vada, Hesperis, Basinio de Parma i Giovanni di Bartolo, [© Bibliothèque nationale de France. Ms-630, foli 113r]*.
16. *1457-68: La flota d'Alfons, Giovanni di Bartolo Bettini da Fano, [© Bodleian Library MS. Canon. Class. Lat. 81, 16v] 1457-68: Lluites al voltant de Populonia, Giovanni di Bartolo Bettini da Fano, [© Bodleian Library MS. Canon. Class. Lat. 81, 27r]*.
17. *1457-68: Fi del setge, l'exèrcit de Sigismondo, Giovanni di Bartolo Bettini da Fano, [© Bodleian Library MS. Canon. Class. Lat. 81, 27v]*.
18. *1457-68: Desembarcament de l'exèrcit d'Alfons, , Giovanni di Bartolo Bettini da Fano, [© Bodleian Library MS. Canon. Class. Lat. 81, 100v]*.
19. *1457-68: Setge de la torre de Vada, Giovanni di Bartolo Bettini da Fano, [©*

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22. *1486: Nau catalana al port de Rodes, Rhodes a la "Peregrinatio in terram Sanctam, [© Biblioteca Universitaria de Barcelona, 07-INC-175, fol. 48] i a la [© Biblioteque National de France RES-O2F-22].*
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26. *Finals XV Inicis del XVI: La caiguda de Constantinople, [@ Col·lecció privada]*
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31. *1502: Llibre del Consolat del Mar, Compendi del dret marítim a la Mediterrània. 1320-1330. Edició 1502 de Barcelona.*
32. *1513-15: Triunfo del emperador Maximialiano, Albrecht Altdorfer, [© Biblioteca Nacional de España, pàg. 119].*
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41. *1546-50: (4 imatges) The emperor mustering his troops at Barcelona, The*

Landing off the cape of Cartago , El setge a la Goleta, La ciguda de la Goleta, Jan Cornelisz Vermeyen i Willem Pannemaker, [© Kunsthistorisches Museum Wien, Gemäldegalerie, 2043, GG_2038_VIS 39/41/43].

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57. *1568: Fernão Vaz Dourado (Atlas), , [© Biblioteca Naciona, Madrid / Fundación Casa de Alba Madrid, A-10108, mapa nº 14].*
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61. *1578c: El Papa Pius V i la batalla de Lepant, Il·lustració del llibre "Vida dels Sants ", Stradanus, [© Editor Firmin Didot].*
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63. *1578: Southern South America, including Straits of Magellan with Tierra del Fuego as an Antartic continent.Joan Martines, Portolan Atlas, [© Huntington Library, San Marino, USA, HM 33, fol 6].*
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74. *1582: Arribada del duc d'Anjou, en vaixell, a Anvers, Pierre Loyseleur i Hans Vredeman De Vries, [© Bibliothèque de l'Institut National d'Histoire de l'Art, NUM 4 RES 820, page 58].*
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83. *1596: chart of the Southern Atlantic in Jan Huygan van Linschotten's "Itinerarium., Arnoldus Florentinus Van Langren (holandès), [© Biblioteca Nacional de Portugal, ELZ. 275]*.
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92. *1603: Combat a l'illa de Mactan entre els indígenes i els mariners espanyols, en què va morir Fernando de Magallanes, Anònima Alemany, [© Col·lecció Privada]*.
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4. THE CATALAN FLAG IN SHIELDS AND POSSESSION FLAGS IN AMERICAN TERRITORIES (99 CARTOGRAPHIC MAPS) **(In bold and red: maps with the Catalan heraldic emblem censored, repainted, touched up, and/or tampered with)**

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A Theory on Columbus's Navigation

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ABSTRACT

This paper presents a scientific reconstruction of the possible navigation method used by Christopher Columbus during his first voyage in 1492, based on primary sources from the 15th and 16th centuries.

The main thesis is that **Columbus could not sail in a straight line due west**; rather, he needed to vary his latitude daily in order to calculate his position using the altitude of the North Star or the midday Sun. This variation is only possible by **sailing along oblique courses relative to the equator** (approx. SW → approx. NW, 22.5º of the 2nd fourth part), forming a daily conceptual triangle that allowed to calculate the distance traveled using elementary geometry.

The modern reconstruction by Coín Cuenca confirms that this method is consistent with Majorcan cosmography, with the chart contained in the *Sentències Catòliques del diví poeta Dant* [Catholic Sentences of the Divine Poet Dante], and with the system of astronomical calculation that Francesc Albó was forced to use in his logbook, according to André Rossfelder's theory, later termed the *Regiment de llegües* [Regiment of Leagues].

1. INTRODUCTION AND OBJECTIVES

The objective of this paper is to reconstruct the astronomical navigation method that Columbus may have used during his first Atlantic voyage. Traditional interpretation claims that *Columbus navigated by dead reckoning and empirical observation*, but the precision uncovered in the technical analysis of primary sources demonstrates that he found it necessary to apply a **more advanced system**. For instance, one based on the daily variation of the altitude of the North Star by applying "Pythagorean identities" for the geometric calculation of distances sailed, as explained by Ferrer de Blanes.

This work combines medieval Catalan cosmographical knowledge, Atlantic oceanography, and mathematical calculation to demonstrate that **Columbus's route could not follow any parallel, but was instead composed of oblique tacks relative to the equator** that allowed a daily variation in latitude to be obtained.

2. JAUME FERRER DE BLANES'S LONGITUDE CALCULATION (1493)

The letter sent by Jaume Ferrer de Blanes to Cardinal Mendoza in 1493 is key to understanding 15th-century Atlantic navigation. Ferrer describes three methods to determine the **Tordesillas meridian** or Δ-longitude of **370 leagues west of Cape Verde**. In one of them, he explains how a vessel can reach a specific meridian by observing the increase in the altitude of the North Star. This text forms the conceptual foundation of the astronomical method that Columbus most probably used, as demonstrated by the fact that the navigation data of the 1st voyage match the calculations in the Excel spreadsheet attached at the end as an Annex.

Ferrer stated verbatim: *"The distance traveled cannot be found by sailing parallel to the equinoctial line, and for further details ask the Admiral, who knows more than I do."*

The essential passage indicates that the ship must sail along the "point of west, the Mistral route" [northwest], on an oblique course, until the altitude of the North Star reaches 18º and a third. This makes it clear that the course must be oblique to the equator, not parallel, thereby obtaining a **Δ-latitude** to calculate both the difference in longitude and the distance sailed.

3. COLUMBUS COULD NOT SAIL IN A STRAIGHT LINE

The *Diario del Primer Viaj*e (Casas, 1493) shows how Columbus recorded a "**long count**" of daily leagues (the authentic one) with a precision incompatible with traditional dead reckoning. The accuracy of the leagues in this "long" distance can only be explained if an appreciable variation in the altitude of the North Star occurred every day, which is impossible when sailing strictly west from La Gomera to Guanahaní—that is, the "**short count**" (the false one).

The change of course had to take place at the point where he noted "the compass northeasted" (in the middle of the ocean), which later led him to say that the world was shaped like a pear. The real route was:

- First leg: **approximate SW course**, to take advantage of the Cape Verde Current.
- Second leg: **approximate NW course**, continuing along the Cape Verde Current and sailing until finding Guanahaní, at a latitude above 28ºN; those below were of no use to him (Treaty of Alcáçovas).

4. COLUMBUS OBLIGED TO USE A DAILY RIGHT TRIANGLE

Every day, alongside the **short count (false)**, Columbus recorded the **"long count" (authentic)** of leagues sailed once calculated using the navigation course and the difference in the altitude of the North Star relative to the previous day. Columbus's accurate daily result can only be explained if he calculated it using a conceptual right triangle (Fig. 1):

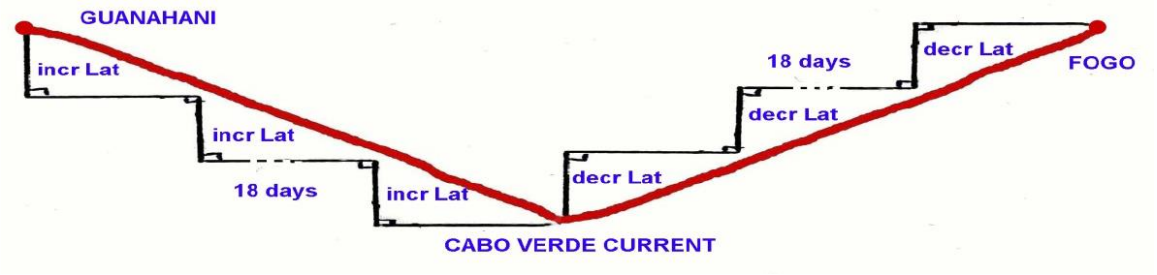

Fig. 1. *Conceptual right triangle for calculating the distance sailed.*

In any of the right triangles in Fig. 1, which simulate the 36 days of the Atlantic crossing, we can apply the **definition** of the sine of the course (or tangent):

$$Sailed_distance = \frac{\Delta Latitude}{\sin(Course\ relative\ to\ East)}$$

$$\Delta - Longitude = \frac{\Delta Latitude}{tan(Course\ relative\ to\ East)}$$

As stated, the only explanation for the great accuracy of the leagues recorded daily in Columbus's journal is that, like Ferrer de Blanes, he calculated the distance sailed using the daily **Δ-latitude** (altitude of the North Star). This calculation is consistent with the use of the *Regiment de llegües* in Juan Pérez de Moya's *Arte de marear* (1564), with the definition of "point of squaring" (*punt d'esquadria*) in Rodrigo Çamorano's *Compendio de la Arte de Navegar* (1581), and with the astronomical squaring system necessarily employed in Albó's logbook according to Rossfelder.

This use of "**Pythagorean identities**" does not explicitly appear in any medieval source, but it is the only coherent explanation for the high precision of the "long count" of leagues recorded in the Journal of the First Voyage. To know whether it was possible to apply this method with pre-calculated tables, one need only know that in 1490 Johannes Regiomontanus was the first in Latin Europe to construct systematic sine tables as an independent tool for astronomical and nautical calculation, to which Columbus had access—although by using an analog computer, he did not need tables.

5. ANALOG COMPUTER: JACOB'S STAFF AND SHADOW SQUARE

The question has been raised as to whether Christopher Columbus possessed trigonometric tables to calculate sines and cosines. Although it was possible to use pre-calculated tables using Al-Farghani's chord tables or Regiomontanus's 1490 tables—as documented in Pérez de Moya's 1564 *Regimiento de llegües*—a clear fact exists since the 13th century with the use of Levi ben Gerson's (Gersonides) Jacob's Staff: its use as a genuine analog computer for the cosine. See Fig. 2.

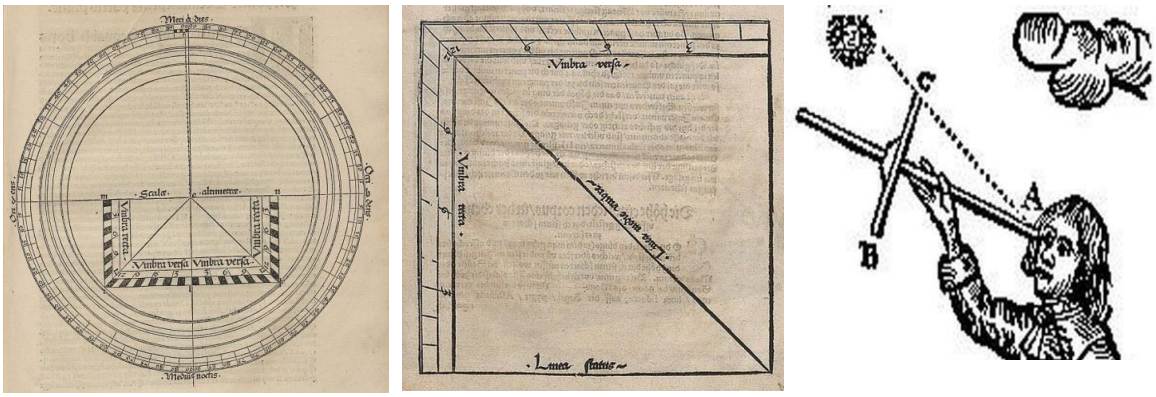

Fig. 2. *Levi ben Gerson's Jacob's staff and shadow square.*

By visually adjusting the cross-pieces, the virtual lines toward the end of the staff form an angle, and the position of the cross-piece on the staff's scale directly indicates the cosine of that angle. That is, the instrument itself executes the cosine calculation mechanically and immediately.

We are faced with a problem similar to the ***"Dispute between Abacists and Algorists,"*** but to determine the value of the "**distance sailed**" (hypotenuse) or the **Δ-longitude** (adjacent side), Columbus did not need tables, as he could use drawings on parchment of graduated right triangles with fixed angles (those of 11.25°, 22.5°, or 45° and their complements), a method equivalent to what is practiced today in Secondary and High School education, where the sides would be marked with units (degrees) using equal divisions.

It was only necessary to take on the vertical leg the number of divisions of the observed Δ-latitude and, drawing a line parallel to the other leg, the intersection with the hypotenuse gave the distance sailed in degrees.

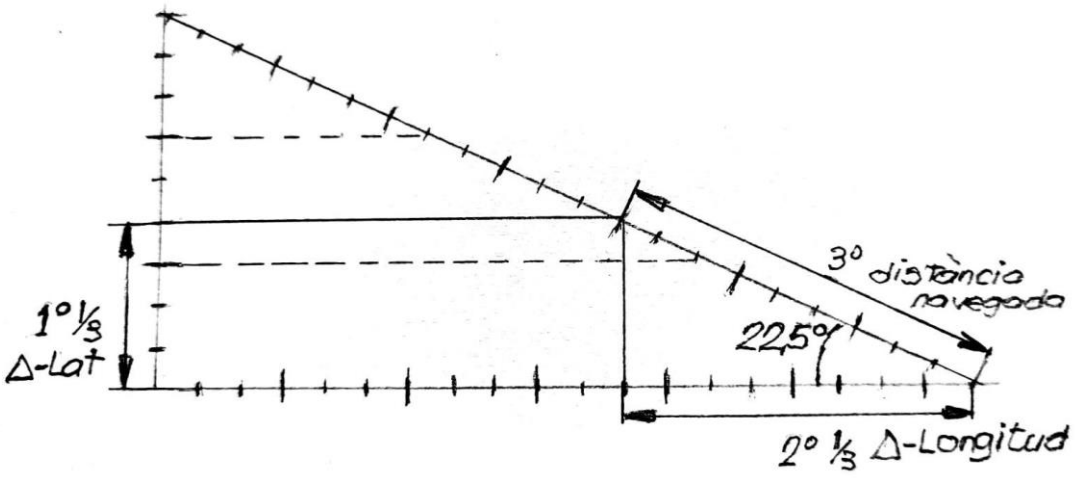

Fig. 3. *Calculation of the tangent of the course using homothetic right triangles.*

Evident proof of the habitual use of these analog computers is the shadow square existing on the back of many astrolabes. The *umbra versa*—the shadow projected by a horizontal gnomon onto a vertical surface (or the cotangent function)—was commonly used, a key concept in the history of medieval trigonometry.

The first tables and scales of tangents and cotangents appear as early as the reverse sides of 9th-century astrolabes, especially in instruments linked to Al-Battani's circle and the Baghdad school, where *umbra recta* and *umbra versa* were used interchangeably. Both form a complementary system used in both Islamic and Renaissance traditions to solve problems of altitude, distance, and depth. Later, mathematicians such as François Viète reinterpreted these concepts under the terms *amsinus* and *prosinus*, integrating them definitively into modern trigonometry.

6. WHEEL OF LEAGUES AND PÉREZ DE MOYA'S REGIMENT OF LEAGUES

In the graphic Wheel of Fig. 4, drawn in the manuscript of Pérez de Moya's 1564 *Arte de Marear*, each spoke corresponded to a point or course that directly showed the leagues sailed per degree of **Δ-latitude**.

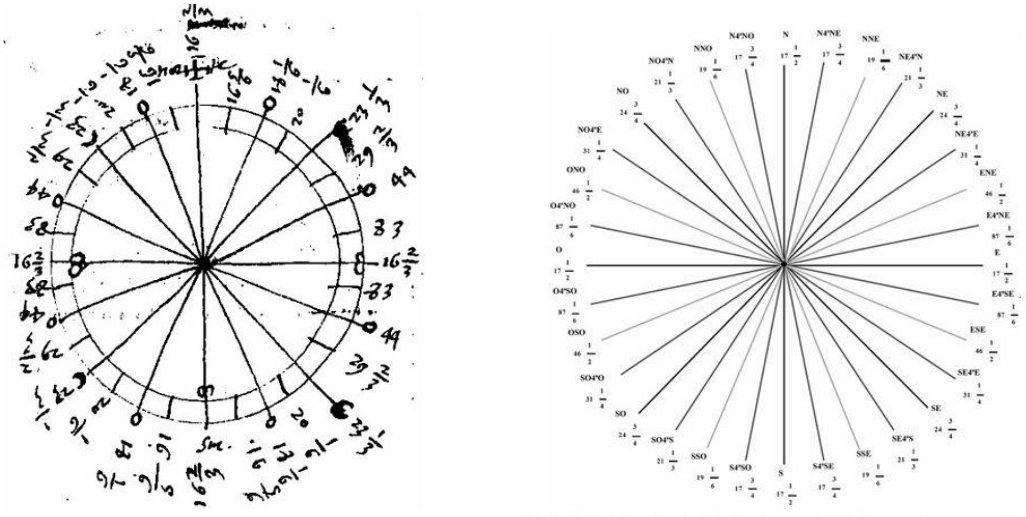

Fig. 4. *Graphic wheel from Arte de Marear (Pérez de Moya, 1564).*

In other words, numerical tables were not required; there could be graphic tables of various types. M. Céu Silva, in her study of Pérez de Moya's book *Arte de Marear*, extracts a wheel with the 32 drawn points, which pilots could use as a sort of analog computer to determine **leagues sailed** or **Δ-longitude**.

The regiment of leagues was a set of pre-calculated tables using Pythagorean identities, which allowed finding the point of squaring that improved upon the point of fantasy (dead reckoning). It was based on calculating the distance sailed according to the course steered

and the Δ-latitude obtained by measuring the altitude of the sun or the North Star relative to the equinoctial line. It was essential for obtaining the point of squaring; its function was to solve the problem of navigation along courses not parallel to the equinoctial line.

This system was already used in 1490 according to Luís de Albuquerque in the prologue to Abraham Zacuto's tables (1490), by José Vizinho and Rui Faleiro, also employed (as mentioned) by Juan Pérez de Moya in his *Arte de Marear* (1564), and finally as a point of squaring by Rodrigo Zamorano (1581). Its use greatly increased the precision of classical dead reckoning.

ACCORDING TO FERRER DE BLANES'S FORMULAS (per 1º of Δ-latitude)

There is no need to make the table for all 32 winds since the acute angles of a right triangle must be under 90º. The table values repeat with right/left and top/bottom mirror symmetry for the other 3 quadrants.

Point (Course)	Course Angle	Distance Sailed (Dº)	Δ-Longitude (Lº)
1st point	11.25º	5.13	5.03
2nd point	22.50º	2.61	2.41
3rd point	33.75º	1.80	1.50
4th point (Mistral)	45.00º	1.41	1.00
5th point	56.25º	1.20	0.67
6th point	67.50º	1.08	0.41
7th point	78.75º	1.02	0.20
8th point (E-W line)	90.00º	Infinite (Parallel)	Δ-latitude = 0

Detail of the procedure:

Key point: Trigonometric calculations were not performed on board; only multiplications with league values taken from the pre-calculated table.

Input data: 1- Course (in points) and 2- Δ-latitude obtained by Sun altitude with quadrant or cross-staff + Declination table.

Output data: Consulting the pre-calculated table, one of the 7 points was taken (out of 28 good ones out of 32 total). Read for each degree of Δ-latitude: First: leagues sailed "D" and second: Δ-longitude in an east/west direction "L".

Rule of three: If the Δ-latitude was 2 degrees, D and L were multiplied by 2. Then, with dividers, either the leagues obtained from this calculation or the Δ-longitude (or east-west displacement) were copied from the League Trunk on the chart and marked on the chart.

7. RODRIGO ÇAMORANO: DEFINITION OF SQUARING (1584)

The *Compendio de la Arte de Navegar* by Rodrigo Çamorano contains the concept based on Ferrer de Blanes:

> *"And to prevent this error, there is another way of plotting a point on the chart called the point of Squaring (*Punto de Esquadria*). Its principle holds two well-known and certain facts: One is the course along which one has sailed, and the other is the distance from the Equinoctial line at which one is located.*

> *Because this entire Art of Navigation is founded upon course and altitude, which is the distance from the Equinoctial line. The course is always known by the compass, the altitude by the star, and the distance from the Equinoctial line by the Sun."*

Thus Çamorano confirms that oceanic navigation was based on:
1. the point of fantasy (*punto de fantasía*, classical dead reckoning position),
2. astronomical measurement (North Star altitude or distance from the Sun),
3. the point of squaring (*punto de esquadria*, calculation of position by "Pythagorean identities").

8. NON-INFLUENCE OF CURRENTS AND LEEWAY

It is essential to be clear and not confuse two terms, as we have two very different concepts:
=> the path actually traveled over the water (modified relative to the seabed by leeway and currents) and, on the other hand, what the calculation yields
=> the geometric resolution of the net position obtained by astronomical observation.

The net position obtained by astronomical observation meets these premises:

1. **Invariance of the observed leg (Δ-Lat):** The point of squaring does not depend on fluctuations, drift, or furled sails during the crossing. It is based on two absolute astronomical measurements (the altitude of the Sun or the North Star at the beginning and end). The difference in latitude (Δ-Lat) is a real and fixed fact, completely immune to ocean currents.
2. **Projection of effective displacement:** The course from the table is applied as the mean or effective course between the two observed latitudes. If a current or wind pushes the ship into zigzags, these individual deviations compensate for or filter out when recalculating position at the moment the second astronomical latitude is taken.
3. **Error reduced to the adjacent leg (Δ-Long):** In classical dead reckoning ("point of fantasy"), drift error accumulates hour by hour over distance and direction. With the point of squaring, the only residual error possible is the small variation in lateral distance (Δ-Long), while the latitude component remains 100% fixed by the celestial body. The calculated distance is the direct net vector between the two control parallels, not the sum of the ship's micro-routes.

In summary: storms and currents cause the ship to travel more real miles over the water, but the point of squaring calculates the effective displacement vector over the geographical grid, making the impact of drift/leeway infinitely smaller than in pure dead reckoning navigation.

9. THE CAPE VERDE CURRENT

The Cape Verde Current, with speeds of up to 6 knots, pushes vessels first toward the Southwest and, from the middle of the Atlantic onward, toward the Northwest. That is, if one wishes to take advantage of this current to cross the Atlantic Ocean, one must sail on oblique tacks relative to the equator, generating the variation in latitude necessary to calculate the distance sailed.

10. FRANCESC ALBÓ'S LOGBOOK (1519)

André Rossfelder's book (2007) *In Pursuit of Longitude* confirms that Albó used a calculation system equivalent to Ferrer's and to that reconstructed by the author for Columbus's voyage. Francesc Albó from Roses, pilot of the Magellan-Elcano expedition, following oblique courses relative to the equator for the dead reckoning calculation of the "point of fantasy" and for calculating the "point of squaring," recorded the following navigation data:

1. Course steered according to the 32 winds.
2. Midday Sun altitude.
3. Latitude calculation using the declination table (Zacuto or Regiomontanus tables).

11. MODERN VALIDATION: COÍN CUENCA

Professor Miguel Coín Cuenca from the Faculty of Nautical Sciences at the University of Cádiz, as explained in John Dyson's book *Columbus: For Gold, God and Glory* (1991), repeating Columbus's voyage along the long route, demonstrated through praxis that:

- The Treaty of Alcáçovas prevented Columbus from sailing south of parallel 28ºN; otherwise, everything discovered would belong to Portugal. All maps up to 1507 place the islands above 28ºN.
- **The East-West route from La Gomera to Guanahaní is false**. The short count recorded by Columbus to avoid alarming the crew was actually intended to show the Portuguese if he were captured.
- The Atlantic crossing is only viable by following a **course first toward "approx. SW"** (22.5º of the 2nd fourth part), up to the middle of the ocean, and **then toward "approx. NW".**

12. CONCLUSIONS

The **high accuracy of the leagues** recorded in Columbus's journal **could not be based on classical dead reckoning**; it is only possible using a more advanced astronomical method, a hypothesis reinforced by modern experiences demonstrating its consistency. This method combined: **oblique courses relative to the equinoctial line** with calculating the distance

sailed through the daily increase in latitude, measuring the altitude of the North Star or the distance of the Sun from the equator using a simple analog computer. His system would be followed by Pérez de Moya's *Regiment de llegües* (1564) and later by Çamorano's *Punt d'esquadria* (1584).

The theory presented in this paper shows how Columbus was able to use this nautical method unique to his time, more advanced than traditional history has assumed, applying a simple analog computer. **The approx. SW-NW route (22.5º), demonstrated through praxis by Coín Cuenca**, was not accepted by Academia because it "legally" attributes the discovery of America to Portugal; for this reason, maps up to 1507 depict all the islands above the Tropic of Cancer (parallel approx. 28ºN), in the Admiral's map as well as in those of Cantino and De la Cosa.

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ANNEX: *Navigation log table reconstruction for Columbus's First Voyage (1492).*

Date	ºlat	Δºlat	Log	Catal	Naut	Real	Lat28N	Catal	Lat28N	False	Notes
			Course	23 º							
03-ago			15	60	45	1.88	15	60	45	1.88	Salida barra de Saltes
04-ago			—	—	—	—	—	—	—	—	Sin datos
05-ago			40	160	121	5.00	—	—	—	—	"Más de 40 leguas"
06-ago			29	116	87	3.63	—	—	—	—	Avería en La Pinta
07-ago			25	100	75	3.13	—	—	—	—	Hacia Lanzarote
08-ago											
>5 sep											
06-sep	*28,0*	0,4	*20*	*80*	*60*	*2,5*	—	—	—	—	*Sale de La Gomera*
07-sep	27,6	0,4	*20*	*80*	*60*	*2,5*	—	—	—	—	*Primer día*
08-sep	27,4	0,2	9	36	27	1,1	9	36	27	1,1	Primer día mar abierto
09-sep	26,8	0,6	30	120	90	3,8	19	76	57	2,4	Primera falsificación
10-sep	25,7	1,2	60	240	180	7,5	48	192	144	6,0	"Contó 48 leguas"
11-sep	24,9	0,8	42	160	120	5,0	16	64	48	2,0	"Contó no más de 16"
12-sep	24,2	0,6	33	132	99	4,1	30	120	90	3,8	"Contando menos"
13-sep	23,6	0,6	33	132	99	4,1	30	120	90	3,8	"3-4 menos" (estimado
14-sep	23,2	0,4	20	80	60	2,5	18	72	54	2,3	"Alguna menos"
15-sep	22,7	0,5	27	108	81	3,4	27	108	81	3,4	Sin falsificación
16-sep	21,9	0,8	39	156	117	4,9	36	144	108	4,5	"No contó sino 36"
17-sep	20,9	1,0	52	200	150	6,3	47	188	141	5,9	"No asentó sino 47"
18-sep	19,9	1,1	57	220	165	6,9	48	192	144	6,0	"No asentó sino 48"
19-sep	19,4	0,5	25	100	75	3,1	22	88	66	2,8	"Escribió 22"
20-sep	19,2	0,2	8	32	24	1,0	8	30	23	0,9	Sin falsificación
21-sep	19,0	0,3	13	52	39	1,6	13	52	39	1,6	Calmas
22-sep	18,4	0,6	30	120	90	3,8	30	120	90	3,8	Viento contrario
23-sep	18,0	0,4	22	88	66	2,8	22	88	66	2,8	Sin falsificación
24-sep	***17,7***	***0,3***	***15***	***58***	***44***	***1,8***	***12***	***48***	***36***	***1,5***	***"Contó 12"***
25-sep	18,1	0,4	21	84	63	2,6	13	52	39	1,6	**Declara doble
26-sep	18,7	0,6	31	124	93	3,9	24	96	72	3,0	"Contó a la gente 24"
27-sep	19,2	0,5	24	96	72	3,0	20	80	60	2,5	"Contó a la gente 20"
28-sep	19,4	0,3	14	56	42	1,8	13	52	39	1,6	"Contaron 13"
29-sep	19,9	0,5	24	96	72	3,0	21	84	63	2,6	"Contó a la gente 21"
30-sep	20,2	0,3	14	56	42	1,8	11	44	33	1,4	"Contó 11"
01-oct	20,7	0,5	25	100	75	3,1	20	80	60	2,5	"Contó a la gente 20"
02-oct	21,4	0,8	39	156	117	4,9	30	120	90	3,8	"Contó obra de 30"
03-oct	22,3	0,9	47	188	141	5,9	40	160	120	5,0	"Contó a la gente 40"
04-oct	23,6	1,2	63	252	189	7,9	46	184	138	5,8	"Contó a la gente 46"
05-oct	24,7	1,1	57	228	171	7,1	45	180	135	5,6	"Contó a su gente 45"
06-oct	25,5	0,8	40	160	120	5,0	33	132	99	4,1	"Contó a la gente 33"
07-oct	26,0	0,5	28	112	84	3,5	18	72	54	2,3	Solo parte con falsa
08-oct	26,2	0,2	12	46	35	1,4	12	46	35	1,4	Sin falsificación
09-oct	26,9	0,6	32	126	95	3,9	17	68	51	2,1	"Contó a la gente 17"
10-oct	28,0	1,2	59	236	177	7,4	44	176	132	5,5	"Contó a la gente 44"
11-oct	29,0	1,0	50	198	149	6,2	27	108	81	3,4	Solo parte con falsa
Total-			**1.132**	**4508**	**3381**		**868**	**3.472**	**2.604**		
Total-			**1.133**	**4533**	**3400**		**1.033**	**4.133**	**3.100**		
Calaver						**3,9**	**Knots**			**3,0**	**Knots**
Reverse						**36,2**	**days =>**	**|28N-**		**42,9**	**days => NOT-Correct**
1 legua Colom			4	as CAT							
			3	s CAST							
			3	uticas							
			6	km							
—											
1. **DISTANCIAS REALES (millas náuticas):**											
1. Gomera → San Salvador (paralelo 28°N):											
Ruta directa por paralelo: ≈ 3,100 nm (millas náuticas) - **Diferencia con registro de Colón:** 2,805 nm (real-Col											
Discrepancia: -295 nm (-9.5%) - **Dentro de error de navegación del siglo XV** - **Condiciones:** Corriente insig											
2. Gomera → San Salvador (ruta por Cabo Verde):											
- **Ruta de los viajes posteriores:** ≈ 3,400 nm - **Ventajas:**											
- Corriente favorable: +5-6 nudos (Corriente Ecuatorial del Norte)											
- Alisios más fuertes y constantes: 15-25 nudos											
- **Tiempo reducido en ≈30%** respecto a ruta directa											

Catalonia, the Necessary Context for the Great Columbian Enterprise

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ABSTRACT

This is a reflection on the historical, political, socioeconomic, and cultural context that motivated and made possible one of the most relevant nautical enterprises in history, due to the fact that it enabled the incorporation of the American continent into the dynamics of European societies starting in the late 15th century.

At the same time, it offers a review of the needs and singular characteristics of Catalan society at the time, as well as its origins and evolution since the 10th century, which make it a firm candidate to assume a major role in the conception, planning, financing, and execution of that Columbian enterprise, without entering into the analysis of subsequent events and consequences.

1.INTRODUCTION AND OBJECTIVES

It is a pleasure and an honor to present this paper in this building, the *Casa de Convalescència* (House of Convalescence), current headquarters of the IEC (Institute for Catalan Studies), built in the mid-17th century within the very precinct that, for more than five hundred years, was the home of the great *Hospital de la Santa Creu* (Hospital of the Holy Cross). We could hardly find a more suitable environment to discuss the institutional development of Catalonia and what its role was in the construction of Europe.

The question we pose is why and how Catalonia was able to build a society capable of generating governing institutions and the instruments that made Mediterranean expansion possible during the Middle Ages, and ultimately, to ascertain whether this was the necessary context to successfully undertake the great oceanic enterprises at the end of the 15th century.

The discovery of the New World was not an isolated event nor the exclusive result of an individual genius. It was the culmination of a long process of legal, institutional, economic, and cultural development that, in Catalonia, had begun nearly five centuries earlier. A country in which, progressively, force ceased to be the sole foundation of political order and began to be replaced by law, covenant, and institutions, in a pioneering evolution within medieval Europe.

The *Hospital de la Santa Creu* , which hosts our sharing of this reflection today, was not an isolated initiative. It was part of a society that had been capable of creating institutions as innovative as the *Assemblees de Pau i Treva* (Peace and Truce Assemblies), the *Corts Generals* (General Courts), the *Diputació del General* or *Generalitat* , the *Consolat de Mar* (Consulate of the Sea), or the *Taula de Canvi* (Table of Exchange) of Barcelona. To this institutional framework should be added the expansion of maritime trade, the improvement of nautical arts, and an intense intellectual and scientific activity that placed Catalonia among the most dynamic societies of the western Mediterranean. It is within this context that Columbus's voyages to the New World must be placed.

The fundamental question, therefore, is not merely the navigator's personal identity, but what type of society could conceive, organize, finance, and carry out a maritime enterprise of unprecedented magnitude. Great historical events always respond to objective needs and are the result of a slow evolution, in which law, institutions, knowledge, and social organization ultimately shape a specific way of confronting the challenges of their time.

Therefore, this paper does not intend to demonstrate or refute the individual authorship of that nautical feat. Other researchers have already presented their hypotheses, and the current state of research, especially after the publication of the *Gran manual de la descoberta d'Amèrica* (Grand Manual of the Discovery of America) by Jordi Bilbeny (2026), allows us to consider the prominent role of the Catalan context as highly plausible. Our purpose is to analyze the conditions that made that enterprise possible, because only a society deeply familiar with the arts of the sea, capable of building ships, mastering navigation, organizing large commercial expeditions, and managing their risks could entertain the search for a new route to the East after the fall of Constantinople in 1453.

So we will attempt to follow this historical process, from *Pau I Treva* to the *Usatges* from the *Corts Generals* to the *Consolat de Mar,* from the *Taula de Canvi* to the *Hospital de la Santa Creu* ; from the guilds to the *Drassanes Reials* (Royal Dockyards) of Barcelona. We will see how all these institutions and initiatives ended up shaping a model of governance and an extraordinarily innovative society, without which it is difficult to understand the context for the great maritime enterprises of the late 15th and the first third of the 16th centuries to take place.

2. A LITTLE BACKGROUND

Given the subject of our reflection, it is worth stepping back a few centuries, because none of the institutions we have mentioned appeared suddenly, nor did they respond to a preconceived project. They were all the result of a long historical process that must be understood in its context and as a whole.

The uniqueness of that which, over time, would become Catalonia has one of its most solid foundations in the political reorganization of Europe driven by the Carolingian monarchy. The coronation of Charlemagne as emperor on Christmas Day in the year 800 by Pope Leo III not only modified the European political balance, but it also determined the configuration of the southern border of the new empire.

The counts of the territories that would later constitute Catalonia were entrusted with the mission to defend this border against the Caliphate of Córdoba. This responsibility conferred upon them a distinct political personality and placed them in permanent contact with two of the great civilizations of the era: Western Christian and Islamic. The Caliphate of Cordoba was at that time one of the most advanced political, economic, and cultural realities in the Mediterranean, turning these territories not only into a border, but also into an environment which promoted connection and exchange.

Over the centuries, their rulers had to combine military defense with negotiation, alliances, and covenants. This option was not always properly understood, and more than one Count of Barcelona was removed from power, tried, or even executed for having defended forms of coexistence between the two great peninsular political blocks.

Its geographical location added another decisive circumstance to this political reality: Catalonia has always been a land of passage, where for millennia peoples of diverse origins have coexisted: Iberians, Celts, Greeks, Phoenicians, Carthaginians, Romans, Jews, Maghrebis, Germanic peoples, and many others. Without idealizing this coexistence, it is clear that this long experience favored a society open to exchanges, commerce, and the circulation of people and ideas.

Perhaps it is here that we should seek one of the deepest constants in Catalan history: the preference for covenant over confrontation and a certain distrust toward war when it ceases to be strictly defensive. This attitude did not eliminate conflicts, but it ultimately made possible the adoption of a different way of understanding the exercise of power.

And it is precisely here that we find the first great turning point in our history. That predisposition toward covenant would crystallize at the beginning of the 11th century in one of the most original movements in medieval Europe: the *Pau i Treva de Déu* .

3.THE *PAU I TREVA:* A NEW WAY OF UNDERSTANDING POWER IS BORN

Toward the end of the first millennium, a decisive event occurred in the history of the country. With the extinction of the Carolingian dynasty and the accession of the Capetians to the throne, Count Borrell II ceased to render vassalage to the new Frankish monarchs. It was not merely a political gesture, but the recognition that, after more than a century of hereditary transmission of the counties, Catalonia was beginning to walk its own path.

That growing autonomy coincided with notable military prestige. Catalan hosts were considered among the most effective of their time and participated, at the beginning of the 11th century, in the succession struggles of the Caliphate of Córdoba. Victory provided immense booty that suddenly enriched counts, bishops, and abbots, but it also consolidated an increasingly harsh feudal regime, in which force threatened to become the sole foundation of political order.

In view of this situation, a segment of society chose to limit power through common rules. This was the great innovation. Spearheaded by Abbot and Bishop Oliba, the first *Assemblea de Pau I Treva de Déu* was convened in the meadows of Toulouges. Its millenary will be celebrated in 2027.

The meeting at Toulouges represented much more than a religious initiative. For the first time, members of the nobility, the church, and common people agreed to establish periods of truce, protect spaces of refuge—the *sagreres* [sacred ground surrounding a church]—and guarantee that certain persons remained beyond the reach of violence. There also appeared a principle that would prove fundamental: the presumption of innocence. Thus an absolutely innovative idea was born: even force had to submit to law. This principle profoundly altered the understanding of power. While in much of feudal Europe law was often the consequence of force, in Catalonia a different conception was beginning to gain ground: force was only legitimate when acting in accordance with the law.

In the year 1032, in Vic, that first moral pact became positive law with the approval of the first laws of *Pau i Treva* . It was the beginning of a process that would lead to the *Usatges* , the *Constitutions* , the *Corts Generals* , and finally, to a political model grounded in covenant and the supremacy of law.

For this reason, the appearance of the *Pau i Treva* laws does not constitute merely a highlighted episode in medieval Catalan history. It is the first foundation of an institutional architecture that, over the centuries, would make possible the development of custom law, representative institutions, and a society prepared to face the political, economic, and maritime challenges of the late 15th century.

4.THE *USATGES:* WHEN COVENANT BECOMES LAW

Under the patronage of Counts Ramon Berenguer I the Old and Almodis de la Marca, in 1068 the first compilation of the *Usatges de Barcelona* (Usages of Barcelona) was approved. It was not a matter of creating entirely new laws, but of organising and systematizing the customs, legal practices, and agreements that had already been consolidating over previous decades, especially following the *Pau i Treva* assemblies.

A century later, in 1173, the oldest preserved written compilation was available, drafted in Latin, which shortly thereafter would be translated into Catalan, facilitating its dissemination and application.

The *Usatges* were much more than a simple collection of rules. They constituted the legal expression of a new vision of society aimed at guaranteeing coexistence through legal certainty. By recognizing rights, they regulated obligations and set procedures that limited arbitrariness, subjecting the exercise of power to common rules.

This is their true historical significance. The political community ceased to depend exclusively on the will of the powerful and began to recognize the existence of a higher law that bounded everyone.

However, the evolution of the country, the growth of cities, the expansion of trade, and the increasing complexity of public life required broader legislative development. Without ever ceasing to be the basis of Catalan civil law, the *Usatges* paved the way for the *Constitutions* of Catalonia and the consolidation of the *Corts Generals* as the supreme legislative body of the nation.

5.*CONSTITUCIONS I CORTS:* AT THE BASE OF COVENANTED GOVERNMENT

If the *Pau i Treva* assemblies had introduced the principle that force must submit to law, and the *Usatges* had set down the first formulations of civil law, the next step consisted of endowing the country with a Constitutional system capable of adapting to a constantly evolving society.

Unlike in other European kingdoms, where the sovereign's will alone could become a source of law, in the Principat de Catalonia (Principality of Catalonia) fundamental laws could only be approved with the agreement of the *Corts* . The *Constitucions* of Catalonia, supreme legal norms, could only be modified by the *Corts* themselves.

These *Constitucions* established, on the one hand, the collective rights of the country against any arbitrariness of royal authority, and on the other, a broad set of individual guarantees: freedom of residence, inviolability of domicile and correspondence, *habeas corpus* , the right not to serve in the royal army except to defend Catalan territory, the right not to be convicted without proof, and above all, the obligation of courts to judge according to the law. To facilitate their application, the *Constitucions* and *Actes de Cort* (Acts of Court) were compiled and updated several times, including in 1413, 1494, 1589, and 1706.

In the year 1251, the *Usatges de Barcelona* were formally recognized as the basis of Catalan civil law. The continuity between the *Pau i Treva*, the *Usatges* , and the *Constitucions* was thus fully consolidated.

One of the most significant moments arrived at the *Corts* of Tarragona in 1260, where it was established that any royal order contrary to the *Constitucions* was null and void, and that no judge or official was obliged to execute it. The text summarized it with a memorable expression: *"The order must be received, but left unfulfilled."* Few formulas express with such clarity the primacy of law over the ruler's will.

This principle attained a new dimension at the *Corts* of Barcelona in 1283. Peter II the Great established that the *Corts Generals* had to convene periodically, "once a year," and bound himself and his successors to observe and enforce everything agreed upon therein.

Six years later, at the *Corts* of Montsó in 1289, the principle of *Observança* (Observance) was approved, according to which laws bound all citizens equally and, above all, the king himself and his officers. This principle was solemnly reaffirmed at the *Corts* of Barcelona in 1481, becoming one of the cornerstones of Catalan constitutionalism.

During the reign of James II, the *Corts* assembled in Barcelona in 1291 deepened this political philosophy even further by establishing that no one—whether rich or poor, cleric, knight, citizen, or town inhabitant—could be arbitrarily detained. An essential principle was thus consolidated: the protection of every person against the abuse of power.

This tradition was developed by great Catalan jurists. Among them stands out Lluís de Peguera (1540–1610), doctor in both laws, who formulated the concept of *immunitas plebis* , that is, the legal protection of the people against any arbitrary action of power. It was not a simple doctrinal construct, but an idea that inspired numerous *Constitucions* and consolidated one of the most remarkable legal traditions in modern Europe.

Concern for justice remained alive during the following centuries. Thus, at the *Corts* of Perpignan in 1351, convened by Peter III the Ceremonious, a *Constitució* was approved that obliged judges to always issue sentences and prevented them from shielding themselves behind formal defects that would leave one of the parties defenseless, especially if poor. The same concern for the common good extended to economic activity. In those *Corts* it was established that the principal headquarters of a business could not be relocated for the sole purpose of evading tax obligations contracted with the community where it conducted its activity. General interest thus prevailed over private profit.

By the mid-14th century, this institutional structure had achieved remarkable maturity. Legislative power resided in the *Corts* ; law was applied by an increasingly structured judiciary, and it remained only to complete the third pillar of the system: the permanent organization of executive power.

6.**THE *DIPUTACIÓ DEL GENERAL:* ORGANIZATION OF EXECUTIVE POWER**

At this point, the Catalan political system had resolved many of the issues regarding law and its drafting. However, a fundamental question remained: who was to execute the agreements adopted in the *Corts* and manage the resources necessary to make laws effective?

The answer arrived during the *Corts* assembled in Cervera in 1359, with the creation of the *Diputació del General* , initially conceived as the body charged with managing the tax contributions approved by the *Corts* and the fiscal resources of the Principality.

Very soon, however, that strictly financial function proved insufficient. Beginning with the *Corts* of Montsó of 1362–63, the *Diputació* acquired a permanent structure and assumed the responsibility of overseeing the execution of *Corts* agreements and the defense of the *Constitucions* between one session and the next. It was also then that the name *Generalitat de Catalunya* progressively took hold, the name by which the institution has reached the present day.

With this, the Catalan political system completed a singular institutional architecture within medieval Europe. The *Corts* drafted the laws; the *Audiència Reial* (Royal Audience) interpreted and applied them; the *Diputació del General* ensured their execution and administered public resources. Without yet answering to the modern formulation of the separation of powers, this model clearly anticipated a concept of government based on institutional balance and the mutual limitation of various authorities.

The political evolution culminated with the *Concòrdia de Vilafranca* (Concord of Vilafranca) in 1461, which explicitly recognized the role of the political community in governing the country. However, this same principle triggered shortly thereafter the Catalan Civil War (1462–1472), which demonstrated the extent to which institutions were willing to defend the *Constitucions* and covenanted government.

Far from disappearing, that model emerged reinforced during the reign of Ferdinand II. The *Corts* of 1481 solemnly reaffirmed the principle of *Observança* , according to which the *Constitucions* bound the king and all his officers as well. Tradition summarizes this reality with an expression attributed to Ferdinand the Catholic himself: *"The Catalans are more republicans than subjects"*. Beyond its literal meaning, this sentence reflects an essential idea: the sovereign's authority was subordinated to covenanted law.

This institutional framework provided the stability necessary for the country's major economic, commercial, and welfare institutions to thrive. The development of trade, banking, navigation, and healthcare cannot be explained without this legal certainty, which fostered trust, investment, and innovation.

It is precisely in this context that an intense intellectual and scientific activity also flourished. Because the construction of Catalan modernity was not merely institutional; it was also a new way of understanding knowledge and its application to the governance of society.

7.KNOWLEDGE AND SCIENCE: THOUGHT IN THE SERVICE OF A SOCIETY IN TRANSFORMATION

It is no coincidence that in parallel with the development of its institutions, Catalonia experienced a remarkable expansion of knowledge. Societies that enjoy legal stability, protect freedoms, and encourage the circulation of people, ideas, and goods also become particularly propitious environments for intellectual progress. The country that had made covenant a form of government and law a tool for organizing coexistence likewise became a fertile ground for philosophical, scientific, and political reflection.

Among all the prominent figures of this period, Ramon Llull stands out indisputably. His *Ars Magna* constitutes one of the most ambitious attempts of medieval culture to construct a rational system of knowledge, capable of organizing different disciplines and facilitating dialogue among cultures and religions. Its combinatorial structure has been considered by numerous thinkers a distant precedent of formal logic, algorithmic thinking, and even certain approaches in contemporary computer science. Whatever the significance of these interpretations, what remains indisputable is the profound influence he exerted on European thought.

Ramon Sibiuda (Raymond of Sabunde) also occupies a prominent place in this intellectual current, connecting more or less directly with much of European humanism and influencing thinkers which were contemporary to the Columbian enterprise such as Erasmus, Joan Lluís Vives, and Thomas More. His work likewise inspired Michel de Montaigne, who dedicated to him his famous *Apology for Raymond Sebond* , incorporating many of his reflections into the *Essays* . And through Montaigne, even Francis Bacon, Descartes, and Pascal, among others. It is not a matter of establishing a linear dependency among them all, but of remembering that certain lines of thought which arose in the territories of the Catalan Crown actively participated in the construction of European culture.

In the political arena, Francesc Eiximenis also stands out as one of the most widely read and disseminated medieval Catalan authors. In *Lo Regiment de la cosa pública* (The Governance of the Public Realm), written in 1383 for the magistrates of Valencia, he reflects on good governance, city organization, and the role of institutions. He defends trade as a useful activity for society as a whole, condemns corruption, speculation, and capital immobilizations, and always places the common good as the ultimate goal of political action.

This conception links smoothly with the common thread we have been following throughout this exposition. Covenant had generated law; law had given rise to institutions, and these created a framework of stability that favored the development of knowledge, economy, and innovation. Institutions, law, and thought were part of the same political culture.

However, there was a field where this synthesis among law, economy, technology, and institutional organization achieved its highest expression: navigation and maritime trade. In and around the Mediterranean, Catalonia developed the legal, economic, and technical tools

that would turn the *Consolat de Mar* into one of the most influential jurisdictional institutions of commercial law in medieval Europe.

8.THE *CONSOLAT DE MAR:* LAW IN THE SERVICE OF NAVIGATION

The 13th-century Mediterranean hosted intense exchanges. Goods circulated between East and West, capital crossed widely different ports, and commercial expeditions involved considerable risks. But for that world to function, having good ships and experienced sailors was not enough. A legal system capable of providing security to exchanges was also required. It is in this context that the *Consolat de Mar* was born.

Its background is found in the *Ordinacions de la Ribera de Barcelona* (Shore Ordinances of Barcelona) of 1232 and in the maritime usages and customs regulating navigation in the port of Barcelona. In 1258, James I officially confirmed these Ordinances, recognizing a customary law that had been consolidating.

Between 1260 and 1270, the first *Costums de la Mar* [Customs of the Sea] were drafted, part of which was subsequently incorporated into the *Costums de Tortosa* , highlighting the rapid dissemination of this maritime law. The process culminated with the creation of the *Consolats de Mar* of Barcelona (1282), Valencia (1283), and Majorca (1326).

The importance of these institutions went far beyond resolving conflicts among merchants. The *Consolat de Mar* established the rules regulating all maritime activity: ship construction and ownership, charter party contracts, freight rate regimes, liabilities in case of damages, insurance, merchant operations, and business liquidations. In short, it transformed the risk inherent in navigation into a legally regulated risk.

This is probably its most important legacy. Without legal certainty there is no investment; without investment there are no great commercial expeditions. The *Llibre del Consolat de Mar* (Book of the Consulate of the Sea) eventually became one of the great compilations of European commercial law and exerted a decisive influence on the maritime legislation of numerous countries for centuries.

Furthermore, this institutional expansion was accompanied by the creation of an extensive network of merchants established throughout the Mediterranean and Atlantic coasts. Among these groups, many Catalan Jews, known in numerous sources as C *atalanim* , played an especially relevant role. Fully integrated into the country's economic life, they shared the Catalan language and culture and conducted an intense commercial activity.

After the riots of 1391, particularly following the assault of the *Call* (Jewish quarter of Barcelona), many chose to convert to Christianity, while others established themselves in Catalan quarters and *alfòndecs* (trading posts) across the Mediterranean, North Africa, Italy, Flanders, the Netherlands, or England. Without losing their connections, they continued

operating as a network and contributed decisively to articulating international trade circuits which, at the end of the 15th century, connected the Mediterranean with the Atlantic.

We observe, then, the coherence of the historical process we have been reconstructing: first, coexistence is covenanted; then, law is constructed; law creates political institutions, and these enable a commercial law solid enough for international trade to thrive, even overcoming the conflicts inherent in an advanced, complex, open, and dynamic society.

Yet, law in itself was still not enough. Great commercial enterprises also required institutions capable of safeguarding capital, facilitating credit, and guaranteeing financial operations. This need would give rise to another first-order innovation: the *Taula de Canvi* (Table of Exchange) of Barcelona.

9.THE *TAULA DE CANVI:* FINANCE IN A COMMERCIAL SOCIETY

If the *Consolat de Mar* provided the legal certainty necessary for maritime trade, another piece was still needed for that system to function fully: an institution capable of guaranteeing the circulation of capital and the financing of major commercial operations.

To this purpose, in 1401, the *Consell de Cent* [Council of One Hundred] founded the *Taula de Canvi* [Table of Exchange] of Barcelona, considered one of the first public banks in Europe. Created initially to organize city finances and guarantee the safety of deposits and payments, it very soon became a pivotal institution of the Catalan economy. Its first documented administrator was Guillem Colom i Saplana.

The *Taula* was open to both private individuals and public institutions. By 1413 it already acted as the financial entity of the *Generalitat* , and shortly thereafter it also managed the accounts of the Church and the monarchy. In 1433 it administered nearly 1,500 accounts, a figure reflecting the remarkable development of the Catalan financial system, as documented in the seven 15th-century volumes out of 940 archival units preserved at the Historical Archive of the City of Barcelona in the Casa de l'Ardiaca.

Its role went far beyond the mere custody of money. It facilitated credit, guaranteed deposits, and secured the economic operations demanded by international trade. Without an institution of these characteristics, maritime enterprises of great magnitude, with the high risks they entailed, could hardly have been financed.

The *Consolat de Mar* provided legal security; the *Taula de Canvi* , financial security. Both institutions constituted two inseparable pieces of the same economic system, being the outcome of a society that had learned to replace uncertainty with organization and risk with trust.

However, the development of such a dynamic economy also generated new collective responsibilities. A city aspiring to be a major commercial center also had to possess institutions capable of meeting the social needs of its inhabitants. It is in this context that the foundation of the *Hospital de la Santa Creu* must be understood.

10.THE *HOSPITAL DE LA SANTA CREU:* UNIVERSAL WELFARE INSTITUTION

The foundation of the *Hospital de la Santa Creu* , in the year 1401, was not an isolated event either. It constitutes a new demonstration of the organizational capacity of a society that had been building, over centuries, institutions intended to guarantee not only good governance and economic development, but also collective well-being.

The initiative came from the *Consell de Cent*, which agreed to merge the city's various existing hospitals—those of *En Colom*, *En Marcús*, *Canon Vilar*, Sant *Llàtzer*, and *En Desvilar* —into a single institution, in order to offer more effective and better organized care. The agreement was approved on March 15, 1401, and confirmed a few months later, on September 5, by a bull issued by Pope Benedict XIII.

This project became a splendid reality for centuries because it was rooted in an ancient tradition, represented by names such as Arnau de Vilanova, Jacme d'Agramunt, Jafudà Bonsenyor, or Lluís Alcanyís at the time of the discovery of America, who contributed decisively to the development of medical excellence within the means of the era in the territories of the Catalan Crown, both in surgery and in the treatment of illnesses, and above all in patient care, as seen in the characteristics of buildings constructed for that purpose, such as the *Casa de Convalescència* and in prevention, as shown by various treatises on pestilence.

The Hospital became the principal healthcare center of Barcelona. Its financing combined private donations, alms, testamentary legacies, and various privileges granted by civil and ecclesiastical authorities, allowing it to maintain its continuous activity over centuries and adapt to the needs of each period.

The *Hospital de la Santa Creu* symbolizes, in short, a fundamental idea: the strength of a society is measured not only by its capacity to trade, legislate, or govern, but also by how it protects its people. This concern for the common good completes the institutional model we have traced throughout this paper and explains why late-medieval Catalonia could become one of the most dynamic and innovative societies of its time.

11.THE *GREMIS* (GUILDS): ENGINE OF MEDIEVAL CATALAN SOCIETY

After tracing the evolution of political, legal, and economic institutions, it is worth remembering that none of them would have been possible without a society capable of

sustaining them. History is made not only by governments or laws; it is built also by the people, through their daily work, knowledge, and trades. It is here that Catalan society demonstrates another of its great strengths.

The *Gremis* constituted one of the essential pieces of this social fabric. They organized different trades, ensured product quality, regulated professional apprenticeship, and guaranteed the transmission of knowledge from masters to apprentices. Access to the ranks of officer and master required passing rigorous examinations, especially in trades of high responsibility, such as apothecaries. This system, under the tutelage of institutions like the *Consell de Cent* of Barcelona, contributed decisively to the prestige of Catalan manufactures. Ceramics, textiles, silk, glass, tanning, blacksmithing, and spirits achieved recognized quality throughout the Mediterranean.

12.COSMOGRAPHY AND CARTOGRAPHY

Building a great maritime tradition does not depend solely on ships, sailors, or equipment. It also requires knowledge. And among all the knowledge necessary for navigation, few were as important as cartography.

Since the 13th century, Catalonia possessed one of the most prestigious cartographic schools in the Mediterranean. Its nautical charts, the so-called portolan charts, depicted coasts, ports, geographical features, and sea routes with extraordinary precision. They were working instruments intended for daily navigation and, precisely because of this intensive use, very few copies have been preserved, although hundreds, probably thousands, were produced to meet both Catalan demand and that of other Mediterranean countries.

Among preserved pieces, the portolan chart of Guillem Soler stands out, recovered a few years ago by the Barcelona City Council after having been reused as binding material for a printed book in 1575. Equally remarkable is the Majorcan chart of Angelí Dulcert, dated 1339, one of the oldest that has reached our days and testament to the excellence of the Majorcan cartographic school.

This cartographic heritage culminated in the great planispheres crafted by the masters of the Majorcan School, especially the Cresques family, who synthesized the geographical knowledge of their time and became a benchmark for European navigators. Without this long tradition of cosmographers and cartographers, it is difficult to imagine the technical preparation required by the great oceanic expeditions of the late 15th century.

13.THE *DRASSANES REIALS* (ROYAL DOCKYARDS) AND THE NAVAL INDUSTRY

None of the institutions we have considered so far would have made sense without a material infrastructure capable of transforming knowledge, law, and financing, into reality. This

infrastructure was the powerful naval industry developed in Catalan ports and, most especially, at the *Drassanes Reials* of Barcelona.

The construction of galleys, ships, and other vessels required an economic activity of great complexity. Shipwrights, caulkers, sailmakers, ropemakers, blacksmiths, carpenters, suppliers of wood, iron, sails, and victuals formed part of a broad productive fabric that made large-scale navigation possible. Concentrated around the dockyards was also the entire logistical apparatus required for provisioning, supplying, repairing, arming, and organizing maritime expeditions.

Unfortunately, today we know only part of this activity. The loss of much of the documentation preserved in the former *Arxiu Reial* (Royal Archive) of Barcelona prevents an exact reconstruction of the daily operation of the Drassanes, which surely would have provided extraordinarily valuable information on Catalan shipbuilding during the late Middle Ages.

Despite this, it is evident that a transoceanic enterprise like the Columbian one at the end of the 15 th century required long experience in shipbuilding, navigation, and maritime organization. To all this should be added the knowledge of cosmographers, such as Jaume Ferrer de Blanes, and the cartography of the Cresques and the Majorcan School, which placed the territories of the Catalan Crown among the principal European centers of nautical science.

14.THE *REMENÇA* SYNDICATE

The last element in this long process of institutional construction was the progressive emancipation of the peasantry. In 1448 the *Sindicat de Remença* (Remença Syndicate) was constituted, one of the first representative peasant organizations in Europe, with the objective of obtaining the abolition of the so-called *mals usos* (feudal abuses).

An exceptional witness to that movement is the *Llibre del Sindicat de Remença* (Book of the Remença Syndicate), preserved in the *Arxiu Històric de Girona* (Historical Archive of Girona) and recognized by UNESCO in the Memory of the World register. Inscribed within are listed more than ten thousand peasants who participated collectively in that grievance, one of the most remarkable examples of social organization in the late Middle Ages.

It was a hard struggle that lasted more than thirty years and that ultimately achieved legal recognition of their status as free men—that is, able to choose where to work, among other rights—a status they did not enjoy in other countries. It should come as no surprise, then, that at the *Corts* of Barcelona in 1493, convened by King Ferdinand II the Catholic, immediately following Columbus's return from his first voyage, specific provisions were taken to enlist peasants, among other professionals, for the second voyage, in order to start

a process of colonization—yet another argument reinforcing the connection of Catalonia to the discovery.

15.FROM THE MEDITERRANEAN TO THE ATLANTIC

By the end of the 15th century, Catalonia possessed custom law, representative institutions, a public bank, an international commercial network, a strong maritime tradition, and extensive experience in administering Mediterranean territories such as Sicily, Sardinia, or Naples.

Considered together, these elements explain why great oceanic enterprises do not appear as an isolated event, but as the natural extension of a long process of institutional, legal, economic, and technical development built over several centuries.

If we add the governance experience of the Catalan Crown, the Mediterranean trade network, the *Consolat de Mar* , the *Taula de Canvi* , cartography, and the naval industry, there emerges the portrait of a society extraordinarily prepared to confront the great oceanic challenges of the late 15th century. It is not surprising that, after the return of the first Columbian voyage, it was at the *Corts* of Barcelona in 1493 where provisions were enacted to undertake the second voyage to the New World and the first measures were established to settle in the discovered territories.

16.CONCLUSIONS

We have travelled through nearly five centuries of history to see how, in Catalonia, force progressively ceased to be the sole foundation of political order and was replaced by law, covenant, and institutions. From Pau i Treva arose the *Usatges* ; from the Usatges, the *Constitucions* ; from *the Constitucions* , the *Corts* and the *Generalitat* ; and upon this legal and political structure developed the *Consolat de Mar* , the *Taula de Canvi* , the *Hospital de la Santa Creu* , cartography, cosmography, the naval industry, and an intense intellectual and scientific activity. All together, this configured one of the most dynamic societies in the late-medieval Mediterranean.

Therefore, the discovery of the New World, from this perspective, appears as the culmination of a long historical process of institutional, economic, and cultural development. Beyond the debate regarding the personal identity of Christopher Columbus, what this paper has intended to show is that Catalonia brought together, at the end of the 15th century, the legal, financial, technical, and human conditions necessary to conceive and sustain an oceanic enterprise of that magnitude. So the Catalan dimension of the discovery ceases to be merely a biographical question and becomes a historiographical hypothesis to be evaluated in light of all evidence available. In any case, the existence of a **Catalan Christopher Columbus, a prominent member of a well-known Barcelona lineage**, with a biographical profile

linked to navigation, commerce, banking, and the most relevant institutions of Catalan society at the end of the fifteenth century, would be **the most plausible conclusion** to close this lengthy controversy.

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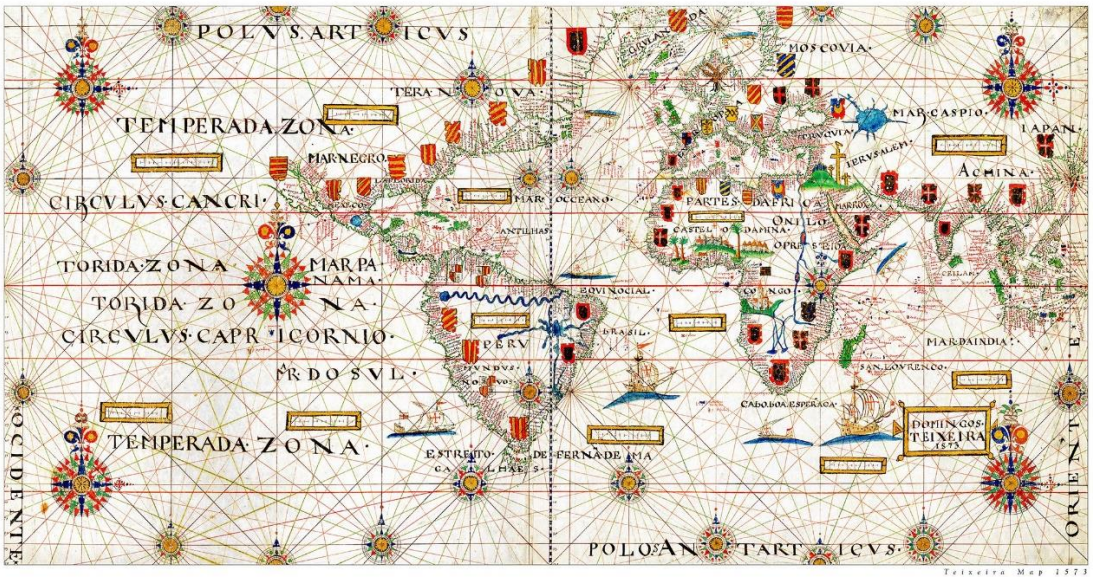

Teixeira Map 1573



