Spatio-Temporal Narratives

Spatio-Temporal Narratives: Historical GIS and the Study of Global Trading Networks (1500-1800)

Edited by

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PREFACE

A Flemish scholar from Haarlem, Michael Van der Veen, disciple of Johan Huizinga, gave a precise account of the punctual appearances on several places on the planet since 1614, of "the Flying Dutchman" (Cunqueiro, 1998: 121–123). In 1731 the Dutchman enters the port of Genoa on his ship, and an old sailor from Liguria recognizes him because they had been drinking together in Lisbon in 1689. Forty-two years later, the Dutchman is still a young-looking, pitch-black haired fellow of an intriguingly melancholic sort. Rumours of witchcraft reach the Genoese authorities, and at dawn on a stormy morning the Dutchman flees. Then in 1718 he sets foot on Saint-Maló and wins the love of the young daughter of a member of the Chamber of Commerce. He runs off with her only to abandon her some months later on a beach near Boulogne. The girl will remain insane during her short life, ceaselessly shouting "the burning man is coming, the burning man!" In 1736 he is again to be found in Lisbon just arrived from New Spain, where he visits a woman and gives her news of her husband who is an innkeeper in Veracruz. But then, once again, the Dutchman is gone with the outward wind. Then in 1751 he is seen in Naples where an aristocratic lady dates him and then tells the story of a Dutch captain that cannot live on land for longer than nine days, and those nine days come at a price of nine months of ceaseless navigation; and he can be killed only by fire; and if you ask him for his name he will reply, "Call me *Foreigner!*"

The very last documented account of the stay of the Dutchman on land has him stay in London, then Marseille, in 1819; in the latter he met an envoy from Napoleon. Before that he had stayed in Lübeck some time during the blockade years in Europe; he had been seen as well in the Bermudas, Amsterdam, Java, and sailing around the Cape of Good Hope. This piece of sailors' imaginary describes the ceaseless wandering of Willem van der Decken from Holland, a Jewish captain, as he was sentenced to an eternity of aimless sailing that would see him join political or military causes, frequent taverns and make women fall for him, or engage in business of an uncertain kind. Almost every man who met him turned mad, and no-one ever knew how to put an end to such long and miserable peregrination. This story has been repeatedly depicted in art, music and literature, and its protagonist has been identified with a real

man by the name of Bernard Fokke (Falkenburg in Dutch literature). He was the captain of a vessel notorious for its cruise speed when travelling between Holland and Java; he was thought to have struck a deal with the Devil some time between 1641 and 1680. There are differences between the various versions of this famous example of the sailors' imaginary in which the sea plays the part of a frontier world across which seamen lead a life of constant wandering between port cities (Fitzball, 1826; Marryat, 1837; Irving, 1855; Neale, 1840).

This is a reference to changes in time although strongly linked to space since space is neither static nor immutable; what is more, this is a clear reference to travelling narratives. The Flying Dutchman seemed to have the gift of ubiquity, he was everywhere and nowhere. Time and movement are dialectic concepts in space and they are related to the dynamic systems and their evolution. Just as in sailors' tales, the spatial frontier where historical progression takes place is a dynamic, non-linear reality where consequences may not be proportional to their causes (Puu, 2003). Besides, it is deterministic and described in terms of three distinct elements: the configuration space, the agent making the change, and the whole of final states. Just as in any good narrative, the space where events take place acts as a category needed for the description of events. Space makes history immutable and ever-changing at the same time as can be seen in the materialization of the various forms of existence, in policy making, in socio-historic organizations and in theoretic paradigms. Every time we construct a narrative it manifests itself in space as space is essential to human action, especially when it comes to thinking historically as advised by Pierre Vilar, because every historical moment has its own way of thinking, and the evil of anachronism must be avoided as Lucien Febvre warned us (quoted in Vilar, 2004).

This book is a collective dream that has come true. It is the result of years of research conducted by the authors of this volume as part of a project that has meant a new turn of historical studies as a scientific discipline that is vital so we can understand the evolution of human behaviour, the interactions among individuals and groups, and the resulting societies shaped by this behaviour. That project was named "Dynamic Complexity of Cooperation-Based Self-Organizing Commercial Networks in the First Global Age" and it was funded by the European Science Foundation. This project ran between 2007 and 2011 as part of the EUROCORES "The Evolution of Cooperation and Trading" and under the DynCoopNet acronym (Owens, 2008: 23–35). Its object was the expansion of the available data on the evolution of cooperative relationships responsible for the self-organizing commercial networks that

created and sustained the first global economy (1400–1800) by integrating disciplinary methods such as Geographic Information Systems (GIS) and other information technologies. The perspective was multinational and multidisciplinary and it was innovative in its conceptual focus and the unusual disciplinary combination of history and other social science methods. As far as historical sciences are concerned, this project intended to refute the classic theory that greater human cooperation in trading became possible with the increased effectiveness of the state, which was accompanied by the rise, primarily in Europe after 1500, of capitalism and the individualism characteristic of modernity. This theory will not stand up to the scrutiny of the analyses of the processes of spatial economic integration, by using actual historical data, on agents, forms of network behaviour, and the mechanisms these agents and networks developed in order to communicate through trade the areas of production and markets along the intercontinental sea routes. These international routes greatly expanded from the 15th century onwards. And this era of so-called merchant capitalism was central to the understanding of the emergence of new economic/financial and social behaviours as determined by how the world was integrated and spatially linked. This dynamic complexity, as defined by Andre Gunder Frank, requires a wealth of historical data as well as powerful tools that are capable of handling massive amounts of information (Frank, 1998). The DynCoopNet project has gone a great length in revealing the mechanisms of cooperation that permitted merchants and others to establish the often long-distance trading networks of the first global age. This is particularly relevant when studying the expansion of the Iberian empires of Portugal and Spain; these were much more interconnected than would appear on first sight even when the dynastic union between the Kingdom of Portugal and the Spanish Monarchy between 1580 and 1640 was no longer in force. This interconnectedness has been proven in other works where the special features of these corporate and composite monarchies were discussed, and the impact of the activities conducted by social agents was heavier than that from the political and even the military powers. Between the 16th and the 18th centuries, the specificities of certain shadow empires (Winius, 1983: 83–101) made up of a multitude of different agents conditioned Spain and Portugal to became the first imperial powers on a worldwide scale, and although they lost their political primacy in the 17th century, both monarchies survived and were able to enjoy a relative success until the early 19th century. The networks in the empire did definitely condition this expansion as well as other "expansions" in England, France or the Low Countries since all these expansions had to adapt to how other

territories in Europe, Asia and America would socially and economically fit in these Iberian empires. Besides, the analysis of the social networks and their spatial links shows how important these networks and their links were on the circulation of ideas, cultures, religious confessions, identities and other forms of institutional organisation. These studies are being continued in various projects run by former DynCoopNet researchers[1]. Also, further works along similar lines point out those relations between networks and institutions or between networks and ways of commercial cooperation. Having said this, what is really characteristic of the post-DynCoopNet works conducted by these researchers is their increasing interest in spatial history (Fujita, Krugman & Venables, 1999; Hewings, Sonis & Boyce, 2001). This spatial history claims the need to tell narratives not only with text and language but also with images so history can be visualized (Shnayder, 2010), as well as analysed from the fashionable digital humanities perspective. Beyond technical meanings, the specialists in spatial history focus on the space – rather than on the time – aspect as a coordinate that is central to approaching how heavily spatial changes affected behaviours throughout history. It is worth mentioning that this approach is a long-standing aspiration for historians, as it was already present in Fernand Braudel's definition of geohistory as "the history that the environment imposes on men through its constants, what happens most often, or through slight variations in those constants, when they have consequences at human level" (Braudel, 2002: 78), and in the Annales school when the road to a new scientific quality in history was open through empirical-quantitative analyses and the intensive use of historical databases.

Consequently, a cartographical perception of landscape and the geographic framework where historical events take place are central to the spatial turn analysis. This is a new approach to the need to create "mental maps" by historians, but also a return to the *ever-so-important-in regional-*

[1] The projects are: "Understanding social networks within complex, nonlinear systems: geographically-integrated history and dynamics GIS" (SOCNET), which is administered by the NSF Office of Cyberinfrastructure (J. B. Owens and May Yuan); "Una ruta Global: análisis histórico con bases de datos y geovisualización espacio-temporal del comercio marítimo internacional (1717-1850)" (GlobalNet) Reference number: HAR2011-27694 (Ana Crespo Solana) and *Geografía Fiscal y Poder financiero en Castilla en un siglo de transición. Análisis mediante Sistemas de Información Geográfica* Ref. HAR2010-15168 (David Alonso García), both funded by the Spanish Ministry of Science and Innovation (MICINN); and Dynamic Complexity of Cooperation-Based Self-Organizing Networks in the First Global Age, FCT - TECH/0002/2007 (http://www.dyncoopnet-pt.org/) funded by the Portuguese government (Amélia Polonia Da Silva).

studies spatio-temporal analysis, now framed in ever wider contexts, whether national, transnational or, above all, global. This review of the spatial paradigm is very important when it comes to delimiting the social and economic spaces analysed in terms of their relationships, such as in Atlantic history (Pieper & Schmidt, 2005: 17). Although this review is in fact a revival of an approach previously seen in certain classic studies by thinkers and scientists such as Jules Michelet or Fernand Braudel, the notion of "space" allows us to pinpoint geographic areas that condition historic evolution. Certain specialists in Atlantic history take into consideration this relationship with "space" as a fundamental aspect in order to understand the dynamics between empires, or the formation of hierarchical structures around monopolies, or either the "peripheral" or the "leading" nature shown by certain regions. This has been described in studies of the various "expansions" observed from a large-scale treatments perspective that claims that the Atlantic must be regarded as a historical subject, and that analysing how far the influences of the spatial interchanges go is of great importance (Greene & Morgan, 2009). Space as a historic category allows us to highlight a specific event and attach to it further data that greatly add to this event's knowledge; hence the use of historic GISs means an IT-based added value as this technology is placed at the very frontier of knowledge (Middell, 2010: 149–170).

In fact, one of the main basic assumptions of the DynCoopNet project was that the history of any place, no matter how large (the Atlantic), is shaped by the way it is connected to other places and all places are connected to an ultimately global system that shapes the histories of all places (Owens, 2007: 2014–2040). This is why this book insists on a new turn for the studies on expansion and integration in the Modern era; these should be conducted with an interdisciplinary methodology in mind and the use of data-processing technologies that combine historical databases, tools for spatial visualisation and network analysis. The commercial networks to be studied involved a high level of cooperation among people of various ethnic, linguistic, and religious backgrounds. They served to move goods and people within a highly open system over an expanding geographic space. These self-organizing networks, and the strategies employed to achieve cooperation among a large number of widely-dispersed people which made them possible, served as the source of the creativity and innovation necessary to respond in a flexible manner to the endemic disruptions to transportation and capital flows occasioned by war, disease epidemics, arbitrary government actions, environmental changes, and the transportation problems associated with weather, distance, and the available technologies. Without the diffusion of authority and the

widespread cooperation among merchants and others, often overcoming apparently serious cultural and political barriers, the emergence and spatial intensification of the first global economy would have been impossible, but existing research on such trading activity has been too limited and fragmentary to grasp how such networks of cooperating individuals emerged and how they were sustained and evolved for hundreds of years. Therefore studies involve the gathering, organizing, and sharing of data on commercial relationships. In part, this will involve micro-studies identifying these networks and the people involved in them. The historians will find out how, within their social and cultural environments, individual merchants maintained the "creditworthiness" necessary for such a remarkable degree of cooperation over often great distances and with people they sometimes did not know. They will focus on the cultural environment of ways of understanding the world and on the types of cooperation at various scales: family, small firm, rural community, political and economic urban centre, and geographically extensive trade routes (Crespo Solana & Alonso García, 2012).

This book attempts to explore new methods and techniques for research about merchant networks and maritime routes of trade during the First Global Age by using Geographic Information Systems as a tool for visualizing the formation of trading systems, for database management, and for cartographic and spatio-temporal analysis in historical GIS. In order to achieve this goal we focus on key issues for understanding the birth of the so-called First Global Age (16th to 18th centuries): integration of spatial economies, regionalization of markets, the organization of maritime trade routes and the evolution of self-organizing networks of merchants, producers, communities, and other social agents during the age of expansion. The collections of essays will deal with relevant information about spatial and social network analysis, the use of digital cartography and the possibilities of digital humanities: sharing databases via the Internet, metadata and possibilities, problems and new design by using geographic information systems (GIS) for the organization and visualization of data and spatial analysis. This volume consists of twelve chapters dealing with various subjects devoted to the study of the mechanisms by which the socio-economic spaces integrated the Iberian monarchies; specific examples from the Spanish Atlantic colonial trade routes are studied (Crespo Solana); how transnational commercial networks operated, from the specific case of Castilian merchant Simón Ruiz and Portuguese networks (Polonia Da Silva, Pinto, Ribeiro, Morais Barros). These works highlight the process of integration between network and space. The authors intend to argue, with empirical evidence, how this

still innovative methodological approach to the field of history, combined with a renewed theoretical framework, enabled us to generate new historiographical perspectives with significant impact upon the historiography of the First Global Age.

Other papers are devoted to the detailed description, at scientific and technical levels, of the methodology used in a GIS; also the social network analysis and the use of cartography as a representation and visualization method are clearly detailed (Yuan). Three papers explain how spatio-temporal GISs can greatly add to historical studies. J. B. (Jack) Owens is the intellectual father of this research team; he has made a truly outstanding contribution to the theoretic configuration of historic studies of spatial integration, and has had a truly remarkable impact on the development of new methodological devices for spatio-temporal GISs (Owens and Wachowikz). Together with Kantabutra he has now produced an article in which they explain what an ILE (intentionally-linked entity) is: a database system for representing dynamic social networks, narrative geographic information, and general abstractions of reality. In their work, Guerrero Nieto and Saurí describe the development of tools for data transfer from a semantic web perspective. This is also a major innovation that will greatly contribute in the future to the processing of spatio-temporal information contained in historical sources. The paper written by Pérez Asensio, Salas Tovas, Del Bosque, Maestre and Crespo analyzes the application of Social Network Analysis software to Spatial Analysis. The authors study what these technologies offer in terms of understanding and visualizing the relationships between merchants and ships. Analysis is based on the data collected by the DynCoopNet project and made publicly available from the Digital Repository of the Spanish National Research Council (CSIC).[2]

Cartography has contributed from a twofold approach: cartography and networks (Picazo Muntaner), and cartography and GIS (Crespo Sanz). The elaboration of network cartography and the subsequent visualization greatly add to our ability to conduct in-depth network analyses and perceive the main systemic nodes, the network's geographic expanse and configuration as a "small world", and assess its fragility. Two characteristic examples of the global network can be visualized with this tool showing trans-Pacific commerce and its impact on continental America, the Caribbean area, and even the various metropolises. This type of study leads to a cartographic visualization of the port networks including the main connecting ports, and allows for a better observation of

[2] Available at http://digital.csic.es/handle/10261/28394 and http://hdl.handle.net/10261/23414.

the movements of the merchant networks at local level as well as in their connections with other geographic areas. In addition to this, the combined use of GIS and cartographic data offers cartographers new tools to examine the characteristics of historical maps, their distortions, and their functions, as well as making it possible to compare different historical maps through new overlapping technologies. Crespo Sanz uses GIS technologies to study the *Atlas de El Escorial* (c. 1538), a manuscript of the Iberian Peninsula consisting of an index map (1:2,600,000) and twenty detailed maps (1:400,000). The geographical and spatial details of this Renaissance manuscript allow scholars to use three distinct, yet complementary, methods of metric analysis. First, traditional mathematical and statistical analysis will be used to obtain the necessary data to appraise the map – determine its scale, accuracy, the degree length, geographical and hydrographical details, territorial limits, and so forth. Such analysis, however useful, generates many cumbersome tables and datasets, making it difficult for scholars to use. GIS with its analytical capabilities will allow scholars to manipulate such large datasets more easily, and thereby gain greater insights into early modern maps and their making. Second, GIS makes cartographical georeferencing possible. This allows us to compare geographical coordinates between various old maps as well as between old and modern maps. That is, we can overlay maps or points on maps to determine more accurately the distortions and other differences between maps. Although there are many georeferencing programs, this study uses Google Earth, which is free and readily available to scholars. Third, MapAnalyst is another tool for cartographical analysis that combines mathematical and visual analysis. This program is user-friendly for those with limited mathematical and computer programming skills; you can compare all kind of maps estimating the distortion between them, watching the values as vectors that express the direction and length of the deformation. By applying these three methods of analysis to the Atlas of the Escorial, this study will show how these approaches complement each other and define a general methodology for using GIS and metric analysis on any historical maps. Along this line Mukherjee discusses the construction of spaces in her work on Srihatta/Sylhet in the medieval Bay of Bengal world. Finally, as added assets to this book I wish to mention the works focusing on the analysis of the links between social networks and the spaces of interaction in which cooperation amongst agents takes place; how the latter take advantage of the strengths and weaknesses present in the systems (Alonso García), and the impact of these agents on the economic structure of ports and maritime routes (Scheltjens).

The authors of these papers have travelled to distant ports in their search for the spatio-temporal relations conducted by the protagonists in history. Technology has assisted us in trying to understand a teleological narrative which, in turn, we can attempt to make available to our readers.

I pass, like night, from land to land;
I have strange power of speech;
that moment that his face I see,
I know the man that must hear me:
to him my tale I teach.
(Samuel Taylor Coleridge, *The Rime of the Ancient Mariner*, 1799).

Ana Crespo Solana

CHAPTER ONE

THE WIDER WORLD: SPATIAL EXPANSION AND INTEGRATION IN THE HISPANIC ATLANTIC, 16TH TO 18TH CENTURIES[1]

ANA CRESPO SOLANA[2]

1. The Spatial History of the Hispanic Atlantic World

In the 16th century the Atlantic was not perceived as a unit of historical analysis, and there was no Mediterranean Sea to be found in the Americas (Games, 2006: 741–757; Greene & Morgan, 2009). However, it was at that time when the Atlantic World began to materialize as a "social environment" in which new forms of human behaviour emerged as a consequence of the challenge faced by those historical actors in that new social, economic, and political environment. The Spanish colonization of the Atlantic world was instituted in La Hispaniola in 1493 by Christopher Columbus on his second trip; this colonization led to the "Hispanization" of vast American territories that were linked through the maritime routes of the Atlantic Ocean. This maritime region was meteorologically ruled by the trade winds that linked the area comprising the Canaries and the Azores with the Lesser Antilles first, and later with the whole of the Caribbean space, including the Gulf of Mexico. That Atlantic space was defined by Pierre Chaunu as a parallelogram drafted around these routes: "lying between the ebb of the trade wind and the flow from the mid-way latitude, this was an immense front that was well marked out between the oceanic coast of Andalusia – a highly privileged point on earth from which the westward, trade winds are born in summer and in which the eastward,

[1] This investigation has been sponsored by the GlobalNet project of the Spanish Ministery of Science and Innovation, Reference: HAR2011-27694.
[2] Instituto de Historia, CSIC.

return winds culminate in winter – and the immense arch of the 'Mediterranean Caribbean' spreading from Florida to Trinidad" (Chaunu, 1973). This vast area affected by the trade winds soon became the main way for integrating the Atlantic and the Pacific oceans since that meteorological phenomenon was discovered by the Portuguese sailors in relation to the Atlantic in the 15th century, and later by Andrés de Urdaneta in 1565 in relation to the Pacific (Hayes, 2001).

Between the "First America" (as David Brading calls the Spanish America in which the first Atlantic world emerged as a result of the conquest and first colonization by the Iberians) (Bernard, 1994), and the port cities of Seville, Huelva and Cadiz, new channels of exchange were opened that was ever-changing in terms of time and space. And in those early days of the hispanization process, in the American Atlantic three issues merged together: race, religion, and language; and these are still widespread in large parts of the American continent from Mexico to Patagonia (around 16 million square kilometres at the time). Brazil and its Portuguese culture and language had strong ties with the Spanish side as Portugal had been integrated into the Spanish monarchy between 1580 and 1640. In this territory "equatorial jungle and desert go hand in hand together with ample savannah plains and closed-in forests not far from the permafrost on a boundless, incommensurable land that reveals an immense living reality, ever changing and diverse; a magic land on which the most diverse ethnic groups can be found under the most dissimilar political structures as well as the most complicated economic systems; a land where social inequalities are widest and where the subtlest of beliefs are to be known, a territory whose cultural roots can only be traced back to the major autochthonous civilisations combined with the Hispanic legacy in all its manifestations" (Vila Vilar, 2012: 27).

This Atlantic space has recently been placed under a constant, major revision. If there is something that really strikes the mind of the present reviewer, it is the fact that British and North American historiography, despite being the intellectual initiator of Atlantic history, did overlook the importance of the Iberian empires, that is, Portugal and Spain, on the integration of an Atlantic world that comprised, and connected, the whole of the American continent with Europe and Africa. Most surprisingly, a wealth of literature available in Portuguese and Spanish has been almost completely ignored; here, the inability to communicate in these languages must have been a major contributing factor. But there are winds of change as many non-Iberian scholars are now stressing the importance of the Iberian colonization and its subsequent influence (Pagden, Elliot, Brading, Armitage, 2004: 12–13). Fortunately, Africa and Asia are now also

included in the analyses of integration, and further methodological perspectives are now available which open new possibilities for a stimulating comparative analysis with other colonial empires (Carmagnani, 2005). Also, studies are turning to a deepening analysis of the dynamics of the global systems of integration between 1400 and 1800; this period is already known as the "First Global Age" or "First Mundialization" due to the spectacular increase in exchange of people, products and culture seen during this long period. The 15th century, especially the last two decades, is regarded as the starting point in this first globalization stage as many crucial transformations in the integration of many regions on the planet happened at the time as a result of human action in a global system (Ringrose, 2000; McNeill & McNeill, 2004).

Defining this historic space, the Hispanic Atlantic, the "First America", from a social, political and economic standpoint was complex and ambiguous then, although there are many convincing testimonies that show the image of an aggressive and authoritarian empire which the Spanish Monarchy or Spanish Empire was eager to project to its competitors in the race to hegemony. The origins of the spatial configuration of this empire can be traced back to the Capitulations of Santa Fe in April 1492; this agreement enabled Columbus to organize his expedition across the sea to the West, and it marked the end of the last stage of the "Reconquista" as conducted by the Catholic kings within the Iberian peninsula, and the beginning of a new era of conquest. A maritime frontier was blown open followed by one on land as new territories were discovered in America; while the crown of Castile shaped an imperial image related to the fights against political oppression, ethnic domination, the establishment of a power-race pairing, and socioeconomic exploitation. This was the beginning of a spatialization of power in the Atlantic world along geographic lines of superiority and subordination (Colas, 2007: 21).

As for cartography, there was a convention in the second decade of the 16th century by which a continent was always depicted as a single mass of land (Fernández-Armesto, 2004: 21). From a socio-political and territorial perspective, Spain, despite being relatively poor, sparsely populated and peripheral, was able to engulf the old Peruvian and Mesoamerican cultures by befriending existing oligarchies and taking advantage of the often extremely violent existing rivalries between the local peoples, and by securing the cooperation of those peoples by peaceful means, or forceful ones in most other cases. Despite certain sectors of society denouncing this state of things since early into the Spanish colonization (something that was unheard of in other colonial empires in the 16th century), the idea of converting native Americans to Catholicism was always present in this

Hispano-American endeavour. Let us not forget that Bartolomé de las Casas, one of the staunchest advocates for the welfare of the natives, expressed his ideas in favour of the Catholic faith as a means of safeguarding the barbarian population in America in his 1531 treatise entitled "On how to attract all peoples to the true religion", which was written after his "Memorandum for the Reform of the Indies" in 1516, and before his well-known "Brevísima Relación".[3] However, it is essential to take into account the dilemma between evangelization and commercial business in order to understand the image of imperialism the Spanish monarchy had; this image was instigated even by the chroniclers at the time, such as Antonio de Herrera. He was intent on blaming the Castilian kings' representatives for the atrocities that were being committed, while the objective of converting to Christianity all peoples in the America already discovered as well as in that yet to discover was present in the colonization ventures as it had been decreed in a series of papal bulls. And it has been recently discovered that there was also a great deal of popular imaginary in which "conquistadores" and colonists were depicted either as cruel, blood-thirsty killers or as altruistic, pacific human beings. But in practice, the ideological pretext of evangelization did hide the actual political and economic motivation behind the building of the Spanish empire during the following three centuries (Aram, 2008: 61–85). By 1750, the configuration of the West Indies or Hispanic America was almost complete in its essentials, and its specific structure remained unchanged until the new period of territorial expansion began in the 18th century. Both of the pre-existing, major cultures in Mexico and Peru had been subdued, but large areas had not yet been colonized; the Amazonian forest, the North of New Spain, and the farthest areas of the South Cone, and a number of small islands in the Antilles, although the latter were quickly occupied by other European powers. In the 17th century, territorial expansion had come to a halt while Spanish migration to America dwindled and "creolization" grew considerably; between 1630 and 1680, European powers were encouraged to settle in the unoccupied territories as the colonization process of the Spaniards was discontinued.

Within a context of European wars, the Spanish monarchy presented an unambiguous image to its rivals and competitors in the imperial race. This Spanish and Catholic monarchy was ruled by a Flemish-German family, the Habsburgs; they had waged several religious wars across the European continent, and had gone from a hegemonic position to the failure of the ideals of "universal monarchy" they had attempted to impose. In Munster

[3] I have used an edition of 1983: Bartolomé de las Casas, *Brevísima Relación de las Destrucción de las Indias*, Anjana Ediciones, 1983.

and Westphalia, the monarchy lost its control over large territories in Europe, and had to accept the independence of the Dutch Republic (Herrero Sánchez, 2000). This hegemonic shift in Europe led to a period of transition between empires which has not been fully studied yet; this period would see the emergence of new ideological concepts and various differing ways of understanding an Atlantic empire. However, the American empire was still held by the Spaniards and its competitors were aware of it even in the 18th century as the hegemony in Europe was no longer in the hands of the Spanish monarchy and the American empire had become too costly for the crown of Castile. The image of a powerful and fearsome empire was present in the political and economic literature at the time; Jacques Accarias de Sérionne (1709–1792), philosopher, wrote: "We see part of the wealth of the European nations in that of Spain, Mexico, Peru and the rest of the regions in the New World, in which this monarchy extends its domination. No other nation in the world possesses such valuable assets to such a large extent and that can be so easily exploited; and no nation would surpass it if the Spanish population and their industriousness were of such high value as those assets" (Sérionne, 1772: T. I. Ch. IV: 144). This idea was also in the mind of merchants and mariners; in 1679, a sailor on board a ship sailing as part of a fleet that departed from the port of Hamburg heading for Cadiz expressed the idea that the area along the course west-south-west was the "Spanish Sea": an area exceptionally dangerous (Martens, 1925 quoted in Pietschmann, 2010: 345–360). Besides, in the historical context at the time it was very common to associate power with an indiscriminate use of violent means, which was normal in pre-industrial societies (Pinker, 2011).

The Spanish Atlantic was a very heterogeneous space. It was described as an empire as it boasted several distinct features that implied a relative lack of permanent and exclusive borders. From its inception it strongly resembled the ideals of the Roman Empire as the Roman occupation of Hispania was taken as a model. Historian Edward Gibbon stated that "Hispania had had the singular fate of being the Peru and Mexico of the Old World" (Gibbon, 1993: vol. 1, chapter VI, 178). Somehow the Spanish colonization of the Indies served as a model too for the Atlantic empires subsequently established by other nations, especially since early in the 17th century. A constant expansion of a nation's borders is nowadays regarded as "imperialism" combined with a capital city or geographic centre in which all institutions of power and wealth are concentrated and, above all, with a definite attempt to subdue other peoples and nations. Despite all this a peripheral status emerged and was consolidated, leading to a fragmentation of wealth and power through a

process that made local authorities become centrifugal elites and resulted in a polycentric kingdom in which, conversely, there was no scope for independent relations between the various peripheral entities (Cardim, Herzog, Ruiz Ibáñez & Sabatini, 2012). According to J. H. Parry, the Spanish empire was feared as it maintained a "maritime life-line" that became one of the oceanic commercial systems having the greatest impact on global processes (Parry, 1990: 117–122). It was an overlapping, multi-layer system of interactions. Parry described the two most important transoceanic systems in place in the 16th century: the Portuguese one with a foot in Lisbon and another in Goa; and the Spanish one between Seville – and the other leading port cities in Andalusia – and the maritime enclaves in the Caribbean and the Gulf. Along this route a two-sided trade system between Spain and its colonies was consolidated as a result of the implementation of a hybrid monopolistic system that remained in operation from the 16th century to the passing of the Spanish Free Trade laws with the Indies in 1776. The Hispanic expansion was devised around a licence-based trading system that was overseen and inspected by the crown of Castile although privately run, and which delimited a number of production areas and markets in Spain as well as in Spanish America.

But that so-called "monopoly" was in fact an institutional flowchart with two objectives in mind; a) to impose on the colonies a centre of wealth and power, and b) to regulate, arrange and levy the fiscal dues on private trade between Spain and America. Several layers of the social spectrum were involved in this trade ranging from aristocrats and noblemen to foreign merchants. A great number of people did participate as transient and non-resident agents, craftsmen and labourers, and they grouped together in merchant colonies or "nations" established in port cities along those routes where they arrived on board merchant vessels. After some time, certain foreign merchants seemed to "fit in" the urban societies in which they integrated and became an elite acting as a powerful and influential lobby for their own trading interests (Crespo Solana, 2010). This commercial system featured strong social foundations as wide as the social spectrum of its human resources and social capital. It is not surprising then that it has been dubbed "the monopoly that never existed" (Oliva Melgar, 2004). In 1580 the Iberian Union was created, and this provided Spain with an advantage until Portugal won its independence in 1640. Despite this temporary unification the two empires operated separately; the trade between Brazil and Portugal was based on relationships between merchants and skippers rather than on a monopolistic system and therefore grew considerably.[4] Trade as well as

[4] See Chapters 5 and 6 in this book.

cultural and economic exchanges took place in combination with other internal – both local and regional – processes that happened in well connected areas such as Mexico, the Caribbean and the Guianas, and Brazil, as these areas were more open to continuous human and economic migration. The other basic pillar of this system was created by the Portuguese on the coast of West Africa as a very active structure (especially after 1550) for the extraction of slaves and their transportation to America. The Slave Trade is central to understanding the involvement (both at private level and as monopolistic companies) of the Portuguese, the Dutch, the French and the English in this so-called "triangular trade"; a "third layer" of interactions was raised in relation to this trade, due to the expansion process undertaken by Holland, France, and England which led to their integration in the American markets, especially after 1620.

The historiography of trade, merchant networks and international maritime routes between the 16th and 19th centuries has shown the most important factors in the evolution and consolidation of the so-called Atlantic World. Atlantic history and global history are two concepts which are, to a certain degree, complementary in the light of new developments in the study of European expansion, its interaction with other continents and the various interconnected systems and sub-systems for trade and social and cultural exchange resulting from these connections over the centuries. However, it is a line of research which is still being reviewed and new contributions have also been made from a socio-economic and political and institutional point of view ((Baillyn, 2005; Canny, 2002; Armitage and Braddick, 2009). For certain specialists in the Modern age and colonial expansion, this interaction began with European expansion in the 16th and 17th centuries, in an era dubbed Mercantilism. According to sociologist I. Wallerstein, who created the concept of a *Modern World System*, the economic interdependence between different worlds began in the 16th century (Wallerstein, 1984). Later, other historians, perceiving a certain economic interdependence on a worldwide scale, fine-tuned the description of the creation of a global silver market and the interconnection of global routes linking various trade areas. Historians also perceived certain economic interdependence at a planetary scale in the early modern age, at least in so far as the world silver market was concerned (O'Flynn and Giráldez, 1995). Further recent studies on history and globalization depart from the economic aspect and enter cultural and anthropological fields in order to explain the emergence of cultural systems at regional level. Studies on the Atlantic system in the Modern age were intent on finding answers to more complex questions as the perspective of possibilities broadened in the comparative history on

societies that have, or had, the Atlantic as the centre of their exchanges not only at economic, but also at ideological, human and cultural levels. Specialists on Iberian, British, Dutch, or French expansion have highlighted the fundamental role of the Atlantic exchanges in the regional integration of Europe, America, Africa (due to the traffic of black slaves), and Asia. Top specialists in Europe are approaching the topic from the perspective of constructive criticism and based on well known studies of European expansion between the 16th and 18th centuries. This is a key period to understanding some of the current consequences of this expansion process. Historians such as John Elliot, Horst Pietschmann and Pieter Emmer (to name but a few) have been able to call on the debate of the experts in Early Modern European history. There may still be an outstanding subject: analysing the influence of the Spanish commercial systems in how the other empires' spaces were articulated from a perspective that is broad and comparative and takes into account cross influences.

It is obvious that the Atlantic world could not be regarded as a separate system. In addition to this, by the 18th century only two facts would appear to contradict either view. First, during the 18th century there was a sharp increase in the market availability for certain Atlantic products (for example, furs) in the Indian Ocean basin (and probably in East Asia as well). Second, the discovery of gold in Brazil in 1689 lowered the "world" price of gold, undercutting demand for gold from Mozambique and increasing the export of African slaves from Mozambique to the Atlantic destinations. Two key issues have to be taken into account in order to understand how the Atlantic became an integrated area and what types of interrelations occurred between the port cities/ports of scale along these integrated routes. Those two key matters are: first, how the Spanish fleets and galleons operated; and second, how this vast territorial and oceanic space for exchange was articulated as one of the main linking routes. In this paper I will devote my analysis specifically to the description of the Caribbean area and the Mexican Gulf as these were crucial in the integration of the New Continent in this emerging socio-political, economic and cultural stage that formed in the Spanish America and where syncretism was a key feature.

2. Theoretical Framework

There are methodological obstacles to the idea of studying the spaces created by Iberian expansion as a unit which can be overcome by an approach based on spatial analysis. The first voyages of westward

expansion crossed the ocean with the aim of reaching the Indies. These rich kingdoms of Asia had been known for centuries and European merchant states such as Venice and Genoa maintained trade with them. However, when these westward voyages began, there was very little understanding of the Atlantic. Until the 1493 letter from Martín Alonso Pinzón and the map made by Juan de La Cosa (circa 1500), most cartography schools focused on the Mediterranean and on the collective imagination or fantasy about what might be found when sailing west, away from the coastline of Africa, which had been explored using coastal navigation techniques as early as the Phoenicians. Juan de La Cosa's map is without a doubt the earliest known representation of the American continents and it contained previously unknown information. Shortly afterwards, in 1507, Martin Waldseemüller produced the map that gave America its name and depicted a world very distant from the geography of Ptolemy, made by Juan de La Cosa in El Puerto de Santa María (Cádiz), circa 1500 (Álvarez, 2003: 1–15; Fernández-Armesto, 2007: 86, 168).[5] Like him, many other cartographers of the period tried to express the idea of a space in movement, where there were no clear boundaries and in which territorial principles, ideas and frameworks took shape. Historical cartography thus became established as "the science that studies human events through their representation in the theatre of operations in which they occurred, or how they are expressed as comprehensible schemata, as in maps, literary portrayals, paintings or diagrams, which use images or symbols to describe a successive reality" (Varela Marcos, 2012: 17). This idea of relating space in movement to cartography would be present throughout the formation of the Hispanic Atlantic world that took shape around the so-called *Carrera de Indias*, from the first enterprises seeking to colonize and occupy the territory. This is especially true after the 1513 voyage of the armada headed by Pedro Arias Dávila, known as Pedrarias, to what was later called *Castilla del Oro*, an area currently occupied by the countries of Nicaragua, Panama, Costa Rica, and northern Colombia. This expedition in effect meant the occupation of the geographic space which the Spanish crown would designate as the West Indies. It was also an attempt to open up a new route, "a short and easy passage", to the East Indies and the Cathay described by Marco Polo, an idea older than the discovery of the New World itself (Mena García, 1998).[6] From that time forward, the idea of the *Carrera de Indias* meant a maritime-terrestrial

[5] The original map is in the Museo Naval, Madrid (MNM).

[6] AGI, Contratación, 3253: "Cuentas del Gasto de la Armada que fue a Castilla del oro a cargo de su gobernador Pedrarias Dávila, dado por el tesorero de la Casa de la Contratación Don Sancho de Matienzo". Libros de Armadas, 1513-1515.

landscape that would be used officially to carry the wealth of the Americas to the Spanish ports authorized to put together fleets for the New World (Seville and Cádiz). Historically, the *Carrera de Indias* can be defined as "maritime activity between the Iberian Peninsula and the American colonies as well as every business and other endeavours related to that activity. When a trader engaged in American trade by loading his merchandise onto the fleets and galleons, it was said that he was involved in the *Carrera de Indias*. After all, this term defined a historical category that entailed the development of a definitive way of life, which was strongly linked or even subjected to the evolution of a specific, but not limited, mercantile-geographical system, for this system was connected to other trading areas that did not belong to the Spanish empire but were intrinsically linked to it" (Crespo Solana, 2011: 19).

However, beyond purely geographical frameworks that involve thinking about the Atlantic Ocean and the world of relationships and interactions that began to establish themselves in all geographic areas connected to one side or the other, there arose a historical "system" which has been constructed as part of an intellectual tradition that has defined the "Spanish Atlantic system" as a world of interactions rather than a closed world. Carlos Martínez Shaw described the actual creation of this system as the sum of a dense network of economic, social, cultural, biological and political relationships taking place over more than three centuries (Martínez Shaw, 2005: 12). This was an open system where the influences of other nations interacted, but which was primarily dominated by the formation of a model which in turn served as a model for the other "Atlantic systems", as Horst Pietschmann has also indicated (Pietschmann, 1999).

In this context, geographically integrated history offers new possibilities for analysing global exchanges. Within this framework, the Hispanic Atlantic space serves as an essential benchmark for comparative studies. The basic premise would be cartographic representation and data visualization. This explanation implies a map of complex relationships which is difficult to describe with a simple historical narrative using a teleological approach. As Jack Owens has stated, like other disciplines, the historical sciences do not have clear concepts or offer methodologies and tools which facilitate analysis of the complex systems of history (Owens, 2007). Historical systems in fact comprised complex systems which can be analysed from a number of perspectives. It is also necessary to take different factors into account in order to analyse the dynamic transformations that occur in such systems, how social networks operate within them, and how human activity affects the evolution of these

systems. Geographically integrated history offers a suitable theoretical framework for analysing these complex systems. This approach takes the form of a historiographical paradigm which proposes three basic issues: a) The history of any geographic area must be understood from the perspective of its connection to other places. b) Historical periods are complex, dynamic, non-linear systems. This defines them as spatially large and, especially since the 15th century, heavily interconnected and involved in continuous global expansion. For this reason, one of the most important characteristics of historical periods is that they are unstable and often go through major transition phases, with the arrangement of their structures changing. And c) within these systems, social agents and places are connected primarily by self-organizing networks, defined as complex and flexible centres that form integrated evolutionary networks within the historical framework corresponding to the centuries of the early modern period. These agents, traders, producers, lessees, civil servants and merchant aristocracy were the chief actors involved in innovations and changes in the systems, more so than a good portion of history has traditionally indicated.

Thus, the Atlantic world of the first global age was made up of various systems that operated and interacted within it as a result of co-operation, exchange and the continuous movement of social agents among the different models for political, economic, and social behaviour imposed by the colonial empires. The first global age was a complex, dynamic, non-linear system deriving from the ongoing process of human interaction. It was characterized by its predictability and the emergence of new developments arising from the significant amount of spatial integration which took place beginning in the 15th century on almost every continent of the planet. New social and cultural environments took shape, with significant consequences for human action. From this perspective, key problems or processes for understanding how this system worked are already the subject of analysis. These include the evolution of long-distance trade, the consequences of migration and the formation of localized minorities, racial interbreeding, slavery, and the impact of colonialism. In fact, what gives shape to this heterogeneous geographic space known as the Atlantic world, fed by four continents (North and South America, Europe, and Africa), are these global processes of migration, colonialism, trade, and cultural and intellectual exchange that make the social space of the Atlantic a finite and definable world. Studies of these processes which take a spatial approach seek to move away from traditional jurisdiction-based ideas. Originally championed by French historians, these have become pervasive in historical studies that have

primarily emphasized the study of sovereignty and the formation of the modern state, while a spatial and global perspective extends beyond national boundaries.

Positioning the analysis of the formation of the Hispanic Atlantic world with the study of the ocean routes which developed and how the spaces connected to the *Carrera de Indias* took shape is a challenge for spatial history, as it considers this process from the point of view of geographically integrated history. One of the approaches used in this method of analysis is to put forward new views on how interactions evolved, from local and regional perspectives. The majority of global regional integration since the 15th century has been created by extensive trade and sea voyages. In this context, small causes have large and complex effects which have taken centuries to change. First, foreign trade, especially colonial trade, defined European economies. Secondly, it is not yet clear to what extent internal and external forces converged in the formation of colonial policies, institutions, and the social, cultural and economic issues inherent to the societies of the different regions (Emmer, Pitri-Grenouilleau, Roitman, 2006).

The new challenge is to initiate research devoted to studying, in a parallel, comparative way, the role of the trade networks as actors in the processes of spatial (geographic) integration, in the social and economic relation of the interconnected areas, their evolution and function in each specific spatio-temporal context. J. B. Owens argued (2007) that as an answer to these conceptual and methodological challenges the study of world connected history requires the use of new communication technologies. This approach focuses on the study of problems deriving from spatio-temporal representation and the analysis of networks and routes of great geographical and historic cartographical importance, as previously claimed by Fernand Braudel, but it would not be possible to carry this out without the help of new technologies which will doubtlessly complement and enrich the work of specialists in European expansion and global trade between the 16th and 19th centuries. One of the reasons encouraging us to utilize information technologies (such as GIS) is the fact that those technologies can be of great assistance to historical analysis as visualization is one of the best methods for the empirical observation of phenomena. In view of this consideration, this line of research requires the creation of new conceptual perspectives which look at the spatial turn (Middell and Naumann, 2010), which is considered to be a constitutive element of historical action which also involves the drawing by historians of certain "mental maps" and new research agendas with focus on historical geography (Krugman, 1999; Pieper and Schmidt, 2002). Global

trade between the 16th and 18th centuries would not have been possible without the emergence of new forms of human behaviour (co-operation, competition), the adaptation of which was very much dependent on the complex dynamics from which this evolution developed. Furthermore, this perspective has caused an increase in the analysis of historical data on networks and integration of areas using GIS, with a view to the historian building new narratives of knowledge. In this context, the comparative study of trade activity carried out by various trading companies and the connections between port cities and economic areas becomes an essential topic when it comes to set out new investigations into the commercial systems of the mercantile nations; the Spanish case is a very interesting model for analysis.

Many of the existing studies of the Spanish commercial system (in the Atlantic and, to a lesser extent, in the Asia-Pacific area of influence, due to the trade with the Philippines) make reference to how the trade networks operated in either area. They describe the emergence of new forms of co-operation and competition among economic agents and how merchants developed mechanisms of trading and cooperation. In this respect, a finished project with very interesting results[7] has shown that commerce in the first global age was characterized by high rates of smuggling and this was not possible without co-operation and a close relationship between agents who, on most occasions, lived far apart from each other and had never met one another. In most commercial port cities these agents formed an oligopoly, almost always having previously had ties of kinship through marriage or godparenting by means of various mechanisms of symbiosis and integration. Even when formal commercial agreements could be ratified before a notary, these were frequently hard to enforce and their validity depended heavily on the willingness of the parties to co-operate with each other. For this reason, trust and reputation were crucial factors to understanding merchant behaviour in social environments. Therefore, the behaviour of merchants, financiers, and others in the development of commercial networks will provide evidence of cooperation in trading activity, which has not been considered in other studies. Global trade between the 16th and 18th centuries would not have been possible without the emergence of new forms of human behaviour, co-operation, defection or competition, depending on the complex dynamics of this evolution. Furthermore, this new, proposed, perspective may encourage the analysis of integrating evolutionary social networks into dynamic GIS to form a complex narrative system. According to recent historical approaches to the study of the evolution of social networks, where co-operation is dealt with

[7] See http://www.scientificpapers.org/special-issue-june-2012/.

in the social sciences, especially in evolutionary and historical anthropology, economics, political science, and sociology, the dominant perspective states that greater human co-operation in trading activities became possible with the increasing effectiveness of the state, which was accompanied by the rise of capitalism and individualism characteristic of modernity. This paradigm appears largely based on the standard periodization scheme of the discipline of history, which has viewed the year 1500 as the main turning point after which the metanarrative has been based on the rise, primarily in Europe, of the state, capitalism, and the modern individual, concepts that are frequently reified into actors**.** In this context, the comparative study of the mercantile groups between different cities and the interests that they represent, as well as their influence in the evolution of politicians of different states, the regional integration analysed at levels ranging from local to global, the influence of networks and integration in economic transformation and their role in the modelling and stabilization of intercontinental maritime routes and the hierarchical structuring of markets and productive areas, are key to understanding the emergence and development of the so-called Atlantic System and/or the First Global economy. Most importantly, this type of study can become the foundation for future comparative studies between empires. This proposal aims at going beyond the previous studies of trade networks and communities conducted so far which have provided us with a wealth of information, in order to set the challenge of relating merchant behaviours to economic spatial analyses.

At the same time, the application of GIS technology to the study of world connected history is a recent line of research which is currently drawing the attention of the historian. It is a topic which has given birth to projects which really are on the frontier of knowledge. This line of research offers new analytical perspectives on databases and historical conceptual models designed for GIS technology, but these still require systematic testing with real data. In Andrea Kunz' opinion (2006), the results from historic GIS have two aspects. On the one hand they are related to the history of the evolution of a specific phenomenon such as transport, the administration of a territory, or the development of human relations; by working on simple maps through to related series of subjects the outline of a multimedia atlas becomes apparent. On the other hand it is obvious that the cartographic presentation of historic data not only complements the traditional function of a map by enlarging the description but it may also become a tool in itself to the economic historian as he will be able to observe new connections between the spatial dimensions of historical processes (Gregory, 2003; Knowles, 2008).