



Iberian-Netherlandish Knowledge Exchanges

International Workshop

Barcelona, Institut d'Estudis Catalans, 27-28 November 2009

Workshop ‘Iberian-Netherlandish Knowledge Exchanges’

Barcelona, 27-28 November 2009

VENUE:

Institut d’Estudis Catalans. Carrer del Carme, 47. 08001 Barcelona

ORGANIZED BY:

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WITH THE SUPPORT OF

Societat Catalana d’Història de la Ciència i de la Tècnica
Institució “Milà i Fontanals”. CSIC
Ghent University

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Geert Vanpaemel (University of Leuven)

Presentation

In recent years extensive scholarship has been produced that falsifies the image that the seventeenth century was a period of 'decline' of science in Spain. Without Spain, William Eamon and Victor Navarro-Brotons argue in *Beyond the Black legend* (2007), the Scientific Revolution would be unthinkable. Remarkably, while surely less marginalized in the founding accounts of the Scientific Revolution, the claims which have recently been made for a more important role of the Dutch Republic in the Scientific Revolution in Harold J. Cook's *Matters of Exchange* (2007) highlight related themes to those which also have emerged in the revisionist accounts of Spain and the Scientific Revolution, such as empire, commerce and empiricism.

On the other hand, the traditional narrative on 'science' in the Southern Netherlands in the seventeenth century, which came under Spanish control, is caught in terms of 'decline'. If anything, what this shows is the inadequacy of the writing of history of early modern science confined to national histories. In answer to this dissatisfying state of affairs this workshop will therefore focus on the circulation and exchange of knowledge between the Iberian Peninsula and the Low Countries.

The papers concentrate on the processes whereby this circulation (for example, the exchanges of natural specimens gathered through the global networks of the Spanish Empire and Dutch print culture) produces knowledge.

In particular two aspects of these Iberian-Netherlandish knowledge exchanges will interest us in the context of this workshop:

(1) How should we understand the relation between state and knowledge in the Iberian context? And especially in the Spanish Netherlands? How did the role of the state as a sponsor of often technical knowledge (in the domains of military engineering, architecture, etcetera) effect the nature of knowledge practices in the Spanish Netherlands?

(2) How should we understand the relation between empire and knowledge in the Iberian context? The creation of the Spanish Empire created a space which facilitated the circulation of knowledge from the New World to Europe, but did the circulation of knowledge (think of cosmographical knowledge, but also the arguments of Dutch jurists such as Hugo Grotius in favor of a *mare liberum* to keep the Atlantic free for competitive commercial shipping) also effect the building of the Spanish Empire? Were there significant differences and similarities between the management of the Spanish and Dutch global networks and knowledge economies?

In responding to such questions this workshop hopes, on the one hand, to rewrite the history of the Spanish Netherlands, and on the other, to propose alternative accounts of the change of knowledge practices to that of the Scientific Revolution. This workshop is thus interested in the circulation of images of knowledge as much as in the circulation of knowledge itself between the Low Countries and the Iberian Peninsula.

Program

Friday, 27 November

9:15 -9:30

Welcome and Introductory Remarks

9:30-11:15

Karel Davids (VU University Amsterdam)

Dutch and Spanish Global Networks of Knowledge in the Seventeenth Century: Connections and Comparisons

Maria Luz López-Terrada (CSIC, Valencia) & José Pardo-Tomás (CSIC, Barcelona)

Reading on New World nature in the Netherlands: Editions of First Chronicles and Accounts of Travel to America, 1493-1621

11:15-11:45: Coffee

11:45-13:30

Antonio Barrera (Colgate University, Hamilton, NY)

Spain, Empiricism, and the Circulation of Knowledge in the Atlantic World

Jorge Cañizares-Esguerra (University of Texas, Austin)

The Iberian Roots of 17th-Century British and Dutch Cosmographic Knowledge

13:30 Lunch

15:30-17:15

Mar Rey Bueno (Madrid – Revista Azogue)

Matter of State: Power and Alchemical Knowledge in the Court of Philip II

Víctor Navarro Brotons (Universitat de València)

Astronomical Activity in the Mid-seventeenth Century: The Circulation of Astronomical, Geographical and Cosmographical Knowledge between Spain and the Low Countries

17:15-17:45: Coffee

17:45-19:30

Susana Gómez (Universidad Complutense de Madrid)

The Advancement of Learning: from Spain to England through the Low Countries

Christine Göttler (University of Bern) & Sven Dupré (FWO - Ghent University)

Local History, Global Trade and Knowledge Consumption. The Collection of the Portuguese Merchant-banker Emmanuel Ximenes in Early Seventeenth-century Antwerp

20:30 Dinner

Saturday, 28 November

9:30-11:15

Geert Vanpaemel (Catholic University of Leuven, HU Brussels)

The Jesuit Mathematicians and the Transmission of Technological Knowledge

Juan Navarro Loidi (Instituto de Bachillerato a Distancia "Bilintx" de Guipúcoa)

Sebastian Fernandez of Medrano, and the "Royal Military Academy of the Low Countries"

11:15-11:45: Coffee

11:45-13:00

Henrique Leitão (Center for the History of Science, University of Lisbon)

Military Science from the Low Countries in Seventeenth-century Portugal

Concluding remarks

13:30 Lunch

Abstracts

Karel Davids

Dutch and Spanish Global Networks of Knowledge in the Seventeenth Century: Connections and Comparisons

This paper sets out to analyze the connections, similarities and differences between the structure and operation of the Dutch and Spanish global networks of knowledge in the seventeenth century. While the 'Spanish model' of the circulation of knowledge in principle gave pride of place to the public institutions (especially at the level of the state) and religious organizations and the 'Dutch model' rather accentuated the role of private entrepreneurs, trading companies (such as the East-India Company (VOC) and West-India Company (WIC) and public institutions at a local level, the networks were actually not as distinct or separate as these structural differences might suggest. Patterns of circulation in various spheres of knowledge (e.g. navigation technology) in both the Spanish and Dutch orbits throughout the seventeenth century will be discussed.

Maria Luz López-Terrada and José Pardo-Tomás

Reading on New World nature in the Netherlands: Editions of First Chronicles and Accounts of Travel to America, 1493-1621

The publication of the first chronicles of the Indies and of the first accounts of travel to the New World is a very important chapter in the development of the Netherlands, and especially the city of Antwerp as a centre of book production. The political union of the two territories during the reign of Charles V facilitated this type of exchange. Through the publication in Antwerp of cartographic works as well as a very high number of editions and translations of the travel accounts to America in Castilian, French or Flemish, readers in the Netherlands were kept up to date about the nature of the New World, its geography, its flora, fauna etc. Clusius' *Exoticorum libri decem* (1605) benefited from the information he acquired through his reading of some of these works. This work of Clusius is then a good example of the circulation of scientific knowledge about America. The continuing conflict with the Spanish Crown and the break-up of the United Provinces gave rise to another era in which the work of Las Casas and the translations and editions produced in Amsterdam acquired a markedly anti-Spanish character.

Antonio Barrera

Spain, Empiricism, and the Circulation of Knowledge in the Atlantic World

This paper discusses how Carolus Clusius (1526-1609), Jan Huyghen van Linschoten (1563-1611), and Joannes de Laet (1581-1649) appropriated the work of the Spaniards Nicolas Monardes (1493-1588), Francisco Hernandez (c. 1517-1587), Francisco Ximenez (c. 1560-1620), among others. In the process of appropriation, these authors not only used and disseminated information gathered by Spaniards about the New World but also legitimized and validated empirical approaches that had emerged in the context of the Spanish Atlantic world. Carolus Clusius travelled to Spain, interviewed Spanish physicians, and translated the work of Monardes as part of his work on natural history. Van Linschoten used Spanish accounts, such as Francisco de Gualle's account of his voyage from Acapulco to

Philippines in his book on navigation. De Laet used Ximenez's translation of Hernandez's work in his botanical work. In this paper I want to emphasize that what circulated with these Iberian books was not only information but more importantly, in my view, an empirical approach. These empirical approach had emerged and had been institutionalized in the Spanish American context during the sixteenth century. The books under discussion embodied those practices: the Dutch authors validated those practices by using the Spanish authors and books as source of authority.

Jorge Cañizares-Esguerra

The Iberian Roots of 17th-Century British and Dutch Cosmographic Knowledge.

The early colonial expansion to the Americas, Africa, and India assumed the oceans to be plagued with dangers, many deliberately created by Satan. The crossing of the oceans became thus an epic battle against Leviathan and his many minions: demons knowledgeable in the preternatural. Cosmographic knowledge was not immune to these ideas. On the contrary, cosmographers had a view of the world in which evil and angelic forces battled over control of the oceans and storms. Not surprisingly, the Spanish and the Portuguese developed many of these tropes in the sixteenth century. More surprising, however, is that both the British and the Dutch, allegedly at the cutting edge of the so-called Scientific Revolution, conceived of their imperial expansion in very similar terms in the seventeenth century. My paper seeks to show that Dutch and British cosmographic knowledge was steeped in earlier Iberian models.

Mar Rey Bueno

Matter of State: Power and Alchemical Knowledge in the Court of Philip II

Philip II maintained a close interest in alchemy during his whole life. King of the largest empire the world had even known, it was natural for him to be interested in a science like alchemy which had such great possibilities, both material and spiritual. What for other contemporaries was a form of relaxation from the arduous business of state, became for him a secret of state, a means to achieve the best possible results and put them to the service of his empire. The aim of this talk is explore the fundamental role of Flemish practitioners in this sense, from the Distillers of His Majesty, an elite artisans from Flanders, appointed by royal decrees and with special function in the health service of the court, to the Flemish Jean l'Hermite, Philip's II valet, who left a diary of his stay in Spain, in which he described the pharmacy at El Escorial, details of the distillations carried out and the plants used.

Víctor Navarro Brotos

Astronomical Activity in the Mid-seventeenth Century: The Circulation of Astronomical, Geographical and Cosmographical Knowledge between Spain and the Low Countries

One of the main centers of astronomical activity in seventeenth-century Spain was the Imperial College of Madrid, especially the Reales Estudios that were established there in 1625. These Studies included two chairs of mathematics. In this paper we examine some aspects of astronomical teaching by professors like Jean Charles Della Faille. We examine also the activity of the Spanish astronomer Juan Caramuel in the Low Countries and his relationship with Van Langren, Wendelinus and others. In general, we deal with the spread, influence and evaluation of the works of authors like Wendelinus and Lansbergen in the work

undertaken by the Majorcan astronomer Vicente Mut or the Jesuit Jose de Zaragoza. As is well known, Jesuit scientists like Athanasius Kircher or Giambattista Riccioli established a wide network of astronomical information exchange. The study of the works and correspondence of these authors, together with the work and correspondence of authors like Gassendi, also gives us information about the circulation of knowledge between Spain, the Low Countries, Italy and other areas beyond Europe.

Susana Gómez

The Advancement of Learning: From Spain to England through the Low Countries

In a relatively short space of time, Spanish science has gone from being quite irrelevant in the narratives of the origins of modern science to be considered the actual trigger of the Scientific Revolution. The thesis according to which English Baconianism was deeply influenced by sixteenth century Spanish practices to explore and exploit nature has lately taken a great relevance in the context of the studies about early modern science. Nevertheless, we still have to do a great effort to answer the difficult questions about how Spanish scientific knowledge and scientific methodologies spread through Europe and about the reactions to its achievements and proposals. It remains to know how Bacon and other seventeenth century English scientists and philosophers came to know Iberian science. On the other hand, we cannot forget the great philosophical distance that separated some of the most representative protagonists of English and Iberian science of the period, such as Francis Bacon and Benito Arias Montano. In this paper I try to give some clues about how Plantin's circle at Antwerp was a fundamental connection to understand the transmission of knowledge from Spain to England, but also the great intellectual differences that separated English from Iberian science of the period.

Christine Göttler and Sven Dupré

Local History, Global Trade and Knowledge Consumption. The Collection of the Portuguese Merchant-banker Emanuel Ximenes in Early Seventeenth-century Antwerp

The Ximenes family belonged to the few New Christian and Portuguese families who stayed over several generations in Antwerp and also succeeded in advancing into the aristocracy. As other powerful new Christian merchant families they formed part of a commercial network of family businesses all over the known world as well settlements and branches in Lisbon, Medina del Campo, Seville, Cádiz, Florence, Venice, Hamburg, and Goa, among others. In addition, they developed close ties to the Spanish courts in Brussels and Madrid and the Medici in Florence. They were active in global trade of bulk products and luxury goods (sugar and spices, jewelry, precious stones, pearls, corals, textiles, and books, among others) and in monetary transactions with the Spanish Crown (asientos).

Fernão Ximenez (died 1600), in particular, brought wealth and power to the family. In 1586 Fernão had been granted a brief from Pope Sixtus V confirming the Ximenez family an old Christian lineage. He further entertained contacts with Francesco I de' Medici, Grand Duke of Tuscany, who presided over the Order of the Knights of Saint Stephen, which was founded by Fernão Ximenez, the order's first Commander. Since Fernão died without successors, his Antwerp palace at the Meir came into the possession of his nephew Manuel Ximenez (1564–1632). Manuel also inherited from his brother Duarte a castle with walls, fosses, appurtenances and a church in Basele near Antwerp. Both Fernão and Manuel were close friends of Christopher Plantijn (c. 1520–1589) and Jan Moretus (1543–1610). According to a document dated 1612, Manuel Ximenes considered himself and the Portuguese merchants in

general as “natural patrons” of certain crafts (spice traders, sugar bakers, diamond cutters, and pearl jewelers).

In *L'arte vetraria*, the Florentine alchemist and glassmaker Antonio Neri who was Emanuel Ximenes' guest for several years, calls Ximenes a nobleman of 'gentle spirit' who had 'a universal knowledge of the sciences, more than any man I met or knew in the Netherlands'; he further describes how, under the tutelage of Ximenes, he produced a type of chalcedony glass, which in 'beauty and allure of colors even surpassed the exceptional beauty of oriental agate'. In his palace at the Meir (inherited from his uncle Fernão) Manuel Ximenes brought together one of the most splendid collections of early seventeenth-century Antwerp. It contained mathematical instruments, a '*Distilleer- of Alchimiecamer*', an outstanding collection of armor, weapons, and firearms, the largest library in the Netherlands at the time, some exotica, some relics, and art. Ximenez had a predilection for Flemish paintings and seemed to have collected paintings on copper, particularly representations of fires. However, the most precious work displayed behind a blue velvet curtain was Rubens's *Birth of Venus* from about 1614/15 (formerly Sansouci, Gemäldegalerie, now lost). He also owned several sets of tapestries and gobelins as well as several series of portraits: the Ximenez and Rodrigues d'Evora families, the Medici, the Dukes and Duchesses of the House of Brabant as well as sixteen otherwise unidentified portraits on paper in the library.

In this paper we will discuss this collection in some detail as it allows us to understand the intersections of commerce, art, religion and natural knowledge in early seventeenth-century Antwerp. More in particular, we will show how the collection reflected, on the one hand, the Ximenes family's (past) involvement in global trade, maritime travel and navigation, and the Spanish empire, and on the other, their social aspirations to aristocracy as well as a revived and Spanish courtly interest in the local history of the duchy of Brabant and city of Antwerp, its glorious past and continued presence as a centre of the manufacture of and trade with luxury goods.

Geert Vanpaemel

The Jesuit Mathematicians and the Transmission of Technological Knowledge

During the seventeenth century, the mathematical courses organized by the Jesuit Society established a pioneering model for the integration of mechanical knowledge and technology into the academic setting of a formal education. Whereas traditional training of engineers, surveyors, architects and navigators was still very often provided on an individual basis, the Jesuit courses offered a presentation of the 'mechanical arts' in the framework of classical geometry. In their defence of the special position of mathematical knowledge, Jesuit mathematicians included topics like statics, hydrostatics, architecture and military technology as part of the mathematical canon. Technology was included within the same category as the more classical disciplines geometry, arithmetic, astronomy, optics.

This lecture will examine some of the works published by Flemish mathematicians, in particular Andreas Tacquet, on the topic of military technology, comparing it to other forms of engineering education such as the Leyden school of mathematics or the Spanish Military Academy in Brussels. In particular, attention will be given to the special status of military technology within the general of corpus of Jesuit mathematics.

Juan Navarro Loidi

Sebastian Fernandez of Medrano, and the "Royal Military Academy of the Low Countries"

During the second half of the 17th century the Southern Netherlands were still ruled by the king of Spain, but the relationships between the Iberian Peninsula and Flanders were very scanty. The communications by sea were difficult for the Spaniards after the naval battle of the Dunes (The Downs, 1639) and by land they were still more difficult after the fall of Besançon in the hands of Louis XIV in 1674. The Spanish presence in the Netherlands was mainly military, and in that field there continued to be an important relationship between Spain and the Netherlands until the end of the Spanish dominion.

During the last fifty years of the 17th century the wars in Europe were continuous. The last advances in the art of war carried out by the French Vauban or the Dutch Coehoorn were tested in the battlefields of Flanders. The Spanish troops had not such bright experts. Their military engineers used to be Italian or Flemish, and their gunners mostly natives of the Low Countries. During the last decades of the 17th century Flanders was a formation school for the soldiers coming from Spain. That formative side was reinforced when in 1675 the governor duke of Villahermosa founded a Military Academy in Brussels and appointed Sebastian Fernandez de Medrano to the position of its director.

Fernandez de Medrano (Mora de la Mancha 1646 - Brussels 1705) came from a poor family. He did not do any study and with 14 years he joined the Spanish army and fought at the border with Portugal. With 21 years he left Spain joining the army of Flanders as second lieutenant of the army. In the Low Countries he studied on his own mathematics and the military art. The head of his regiment, Agurto, encouraged him in these studies, incorporating him in the General Staff. Medrano collaborated also with the military engineer Van Es and fought as gunner to the orders of the marquis of Ozeza.

The academy was organized like others in the Spanish armies during the 16th and 17th centuries. The number of students was about twenty. The courses were given during the winter, when there were no military campaigns, and they lasted one year, although the best students stayed another year in the academy, as assistants to complete their studies.

The academy of Medrano was very successful. He affirmed that it had formed more than six hundred military men. Their achievements were due to the good pedagogy of Medrano and to the manuals that he wrote and printed to facilitate the study of his disciples.

Medrano published more than twenty books about fortification, artillery, mathematics and geography. On fortification he explained two methods of building a fortress, one following Dutch authors, and another for advanced students, similar to the first method of Vauban. On mathematics he taught mainly geometry. He wrote and printed a pedagogical version of the *Elements* of Euclides in which the influence of Tacquet is notable. He also taught practical trigonometry. The practical approach also prevailed in his books about artillery. To justify his explanations in the first writings on artillery he mentions Spanish authors, mainly Lechuga, later he preferred French commentators as Fournier, or Malthus. On geography he only explained some elementary knowledge, but his geographical books had a big success. His *Geography in Verse* had up to eight editions. Medrano was not an original author, but he was a good popularizer in all the fields with which he dealt, and he was a renovator of the Spanish sciences and techniques of his time.

The success of Medrano's Academy pushed to renovation the military teaching in Spain. The Council of War tried to open a similar institution in Barcelona, in 1697, placing as professors two of his pupils. But the war and the siege of Barcelona didn't allow beginning with it.

On the other hand their disciples were fundamental in the creation of the branch of military engineering of the Spanish army. During the War of Spanish Succession most of Medrano's pupils, of Spanish or Flemish nationality, fought in Flanders on the command of Vauban.

Their head was Prospero Verboom who studied and was assistant in Medrano's Academy. He was son of Cornelio Verboom, a Flemish engineer, who was a previous head of the Spanish military engineers in Flanders. When Felipe V lost Flanders, Verboom came to Spain and he was the organizer of the branch of engineers of Felipe V's army. To establish this branch he was helped mainly by his partners from Flanders.

In Brussels the Military Academy was reopened in 1717 with the engineer Leonard Hartman as professor, but depending on the Emperor of Austria.

Henrique Leitão

Military Science from the Low Countries in Seventeenth-century Portugal

Historians have already noted on several occasions the influence of knowledge from the Low Countries in the theory and practice of seventeenth century Portuguese military fortification and in related mathematical techniques. It is an influence difficult to miss since it figures distinctively in the most influential Portuguese seventeenth century text on military engineering, Luís Serrão Pimentel's, *Methodo Lusitanico de desenhar as Fortificaçoens das Praças Regulares, & Irregulares* (1680). But exactly how did this happen? In what way and through what channels did this knowledge in military matters and engineering come to Portugal? As it happens, the circulation of military technological knowledge from the Low Countries to Portugal was a complex affair that took place due to a combination of different factors and because different channels were available. Technological know-how from the Netherlands entered Portugal via military engineers but also via Jesuit schools; it involved people from very different cultural and social backgrounds. This circulation of knowledge took advantage of peculiar diplomatic circumstances but also of long-established networks (commercial, printing industry, artistic, etc.) between Portugal and the Low Countries. Far from being simply an episode of intellectual history, it was a complex phenomenon of science, politics, commerce, travels and empire.

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