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The Circulation
of Material Objects of Knowledge
in the Early Modern Low Countries

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Sven Dupré and Christoph Lüthy

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of attention on mechanistic contexts goes hand in hand with an unwillingness to seriously confront that which does not fit. Pictures and concepts form a particular style of thought within which is established what can be considered 'realistic', 'functional', or 'intelligible'.⁶³ The more pictures and terms or concepts correspond to each other, the more evident or 'objective' they appear – the 'harmony of deceptions' generates the appearance of self-authorization. That effect went so far in the case of Clerselier's images that only a group of them was perceived as decisive, while the rest were simply ignored. As we have seen, the complications connected with the schematic images were also ignored in favour of an adjusted reading of the images conforming to the ideal of Cartesian *clarté*.

Paradigmatic images serve to organize a perceptual and conceptual system in such a way that all cognition is reduced to the act of making the appropriate observations according to given preconditions and drawing the inevitable conclusions. Within the mechanistic paradigm, it appears in retrospect that the reductionist-functional variant has been particularly successful in simplifying the interplay between images and text. However, one must be careful to avoid hasty generalizations. It might, for instance, be argued that in the course of the seventeenth century's cultural, social, and economic developments, machines played an increasingly important role and that, for that reason, a collective inclination grew toward a functional understanding of causal interactions. Yet this impression is itself a result of selective historical reconstruction, because precisely in the field of biology there existed various schools of thought with a clearly anti-reductionist orientation.⁶⁴ It must, by way of conclusion, be stressed once more that Descartes' understanding of mechanistic processes was far more complex than later depicted. Moreover, there existed several forms of mechanistic thought in the seventeenth century, not just one. Yet, one variant came to achieve in the perspective of the historiography of later centuries an unchallenged dominance. This success was due to the establishment of a simple, reasonable, and correspondingly powerful functionalist-rationalist machine model. But, as I hope to have shown, not Descartes was the creator of the Cartesian *esprit mécanique*, but Clerselier.⁶⁵

⁶³ On the concept of thought styles and their support of perception, see Fleck, *Entstehung*. See on this Zittel, "Harmonien," 54-75, and Zittel, "Ludwig Fleck."

⁶⁴ On anti-mechanistic biological concepts in early modern France, see Brandstetter, "Sentimental Hydraulics," 495-512.

⁶⁵ Lüthy ("But were there Mechanical Philosophers besides Descartes?" [forthcoming]) has pointed out that Robert Boyle redefined the expression "mechanical philosophy" in 1661, shortly before Clerselier's edition came out, as a collective term for Cartesianism and Atomism. Given Descartes' professed anti-atomism, this Boylean definition is of course untenable as a characterization of Descartes' own philosophy.

Trading Luxury Glass, Picturing Collections and Consuming Objects of Knowledge in Early Seventeenth-Century Antwerp

Sven Dupré

Introduction

In a letter to Pope Gregory XIII, the famous printer and publisher Christoph Plantin, who had been born in the French town of Tours, explained why he decided to move to Antwerp in the mid-sixteenth century to practice his trade:

No town in the world provides more advantages for the profession I wanted to pursue. It is easy to get there, one sees different countries get together at the market; one also finds all the raw materials which are indispensable for my craft; for all professions, there is no problem in finding labourers who can be instructed within a short time.¹

Around 1550 Antwerp had become the most important commercial metropolis north of the Alps. By shipping spices along the African coast the Portuguese provided serious competition to the Venetian spice trade in the late fifteenth and early sixteenth centuries. As the Portuguese decided to make Antwerp their commercial hub of the spice trade north of the Alps, Antwerp profited most from these developments in long-distance trade.² However, Plantin's own trade illustrates that Antwerp's economic status also made it an attractive place for the establishment of a knowledge industry; in this specific case, of one of Europe's leading publishing houses. Like that other city across the Channel, Elizabethan London, Plantin's Antwerp, by drawing together cartographers, naturalists, mathematics teachers, instrument makers and alchemists – to name but a few trades – became a 'knowledge hub' foreshadowing Baconian ideals.³

¹ Cited and translated in Limberger, "No Town," 59.

² Ibid., 41-44.

³ For London, see Harkness, *The Jewel House*. For some suggestions about the Antwerp knowledge economy, see Vanpaemel, "Science for Sale," 287-304.

The closing-down of the river Scheldt after the Spanish gained military and political control over Antwerp in 1585, and the subsequent development of the front line into a border separating the independent Dutch Republic in the north from the Spanish Netherlands in the south, provided a serious blow to Antwerp's economic status. Traditional historiography attributed the rise of Amsterdam in the seventeenth century, when the city came to dominate world trade, to the migration of merchants from Antwerp to the north. Similarly, migration of mathematicians, printers, and others active in Antwerp's knowledge trades to the north was held responsible for the rise of science and technology in the Dutch Republic and their so-called decline in the Spanish Netherlands after 1585. However, more recent studies have attempted to be more precise about the role of southern merchant immigrants in Amsterdam's economy. While no other city welcomed as many merchants from the Southern Netherlands as Amsterdam, these immigrants typically did not belong to Antwerp's merchant elite, but only embarked on their careers in international trade in Amsterdam.⁴ Similarly, the importance of the massive immigration in the late sixteenth century to the acceleration of technological development in the United Provinces has been toned down.⁵ On the one hand, the importation of technology in the north started long before 1585 by small-scale immigrations from the South and continued well into the eighteenth century. On the other hand, the Dutch Republic did not exclusively borrow technological knowledge and skills from the south. Finally, doubts have been raised about the direct connection, by massive migration, between the rise of science in the Dutch Republic and its supposedly simultaneous decline in the Southern Netherlands.⁶ This is primarily a question of timing: not until the mid-seventeenth century did science and scholarship flourish in the Dutch Republic. Moreover, one can also question the continuity between the kind of 'science' practiced in the North and the South.

Amsterdam's rise to dominance of world trade has recently been attributed to the development of the city after 1600 in to one of the most important gateways of exchanges of information on geographically distributed markets across the globe.⁷ Similarly – but replacing the discussion from the level of information to that of knowledge – Harold Cook has argued that “it was no accident [...] that the so-called Scientific Revolution occurred at the same time as the development of the first global economy,” because both merchants and natural philosophers in the

Dutch Republic came to share the same values and placed high value on knowledge that came from the acquaintance with objects.⁸ In Antwerp, too, as we will see, commerce and economy, on the one hand, and information and knowledge on the other, were intimately connected around 1600. But the doubts that have been raised about the alleged ‘continuity by massive migration’ should make us sceptical about drawing parallels too readily between knowledge economies in the northern and the southern Netherlands.

In this essay, I will discuss the importance of the invention, the manufacture, the trade and the consumption of luxury goods to Antwerp's knowledge economy in the early seventeenth century.⁹ Already in the sixteenth century the manufacture of luxury goods was important to Antwerp's economy, but in the early seventeenth century, when the economic climate in the city generally degenerated, Antwerp specialized in the invention of a particular strand of luxury goods, that is those which carried a message about the high value of knowledge. This knowledge was often (but not exclusively) mathematical. However, this knowledge, too, was gained by acquaintance with objects – mathematical objects or objects like mathematical instruments, of which the construction and use was based on mathematical knowledge. This provides us with an interesting difference with the claim made for the connection between commerce and science in the Dutch Republic. While for Cook the objects supporting his claim were *naturalia* and *materia medica* arriving through the global trade networks in collections in the Dutch Republic, in Antwerp these imported materials and objects were used to create other, newly invented luxury goods which, in their turn, exported claims about the high value of mathematical knowledge and knowledge gained by acquaintance with mathematical objects which the materials and objects as such did not carry. In Antwerp, luxury goods were thus invested with a meaning – that is, the high value placed on knowledge that came from the acquaintance with objects – about which the objects themselves were silent.

I will illustrate that Antwerp's role in global trade networks attracted foreign merchants and entrepreneurs to the city as well as the materials and foreign skills necessary to establish a local industry of luxury goods by discussing the establishment and development of a *façon de Venise* glass industry in Antwerp. However,

⁸ Cook, *Matters of Exchange*, 411. Cook wishes to revive the theme of science and commerce. The merging of the fields of art history and economics has a longer recent history of fruitful collaboration. For a short overview, see the introduction to De Marchi and Van Miegroet, *Mapping Markets*, 3-13.

⁹ For this connection between science and the consumption of luxury goods in seventeenth-century England, see Peck, *Consuming Splendor*, 311-45.

⁴ Gelderblom, *Zuid-Nederlandse kooplieden*.

⁵ Davids, *Dutch Technological Leadership*, 203-43.

⁶ De Bruycker and Van Netten, “Bloei, verval en migratie,” 3-30.

⁷ Lesger, *Handel in Amsterdam*, 209-49.

this essay does not only wish to illustrate the connections between luxury consumption and the import of foreign skill. The central point is that the early seventeenth century Antwerp art dealers used *façon de Venise* glass to create another luxury good: art cabinets with a so-called 'perspective' made of *crystallo* glass, a design feature invented in Antwerp which distinguished them from art cabinets produced elsewhere, which carried a message about the high value placed on knowledge. The art cabinets made similar claims as the contemporary pictures of collections (equally a luxury good), a genre invented in Antwerp, which was fashionable during the first half of the seventeenth century. While these paintings argued for the high value of knowledge by situating iconoclastic donkeys that destroyed mathematical objects and paintings in the representations of the collections, in a similar vein the users of the art cabinets were exposed to the catoptrics of Hero of Alexandria, in which Hero underscored the epistemic superiority of the mathematician over the ignorant audience, who could only undergo the optical effects.

Antwerp's Luxury Glass

After a short period of economic decline in the 1520s Antwerp began its true Golden Age. Beginning in the 1530s the export, especially to the Iberian Peninsula, of locally produced luxury goods, such as tapestries, jewellery, paintings and books was the dominant factor in the flourishing of Antwerp's economy. For the production of these luxury goods Antwerp depended upon the immigration of foreign skills.¹⁰ The city encouraged foreigners, especially those who were capable of innovation, to settle in Antwerp by offering them premises in the city to manufacture luxury goods, privileges or a monopoly to protect the new trades from local competition. This policy made Antwerp an attractive place for foreigners to settle, but undoubtedly, the most important reasons of Antwerp's attractiveness were those that Plantin summed up in the letter with which I began this chapter. One economic historian summarized those as follows: "The town offered a combination of raw materials, highly skilled labour force and a high demand for local consumption as well as for export."¹¹

Paintings, musical instruments, books and prints, as well as tapestries, made in Antwerp, were exported across the globe, but also sold to the local and increasingly wealthy elite. In Antwerp luxury goods were brought on the market at

¹⁰ For Antwerp's luxury industry, see Thijs, "De Antwerpse luxenijverheid," 105-13.

¹¹ Limberger, "No Town," 54.

panden.¹² These market places, an Antwerp invention, grew out of the *pand* situated in the cloister of the Dominicans in Antwerp, where members of the Guilds of Saint Luke and Saint Nicholas marketed a variety of luxury goods, such as paintings, silk and silverware, from the middle of the fifteenth century. The Dominican *pand* was later joined, and eventually replaced, by other and sometimes more specialized *panden*, such as the *tapissierspand*, and the *schilderspand* inside Antwerp's new bourse. One of the luxury goods marketed at the Dominican *pand* as early as the late fifteenth century was glasswork. That glasswork was sold alongside paintings is, as such, unremarkable, since glassblowers, mirror-makers and painters belonged to the same guild of Saint Luke. In the *Liggeren* of 1588-1589, 33% of the masters who were members of the Guild of Saint Luke were painters, 11% glassblowers and 2% mirror-makers.¹³

The glasswork sold at the *pand* in the late fifteenth century must have been brownish *Wald*-glass. In the fifteenth century, however, the Venetians (the island of Murano being the most important centre of glass production at the time) introduced a new kind of colourless glass, known as *crystallo*, to denote that it was as clear as rock-crystal.¹⁴ The production of this glass was based on the use of coastal plant ashes (instead of inland plant ashes which were used in regions north of the Alps, for example, in Bohemia, in the production of *Wald*-glass) and on the controlled addition of manganese oxide, the decolorizing agent that neutralised the greenish tint in the glass which came from iron impurities. Venice imported coastal plant ashes from the Levant; when a glass industry was established in Antwerp, for this same purpose the ashes of the barilla plant were imported from Spain.¹⁵ This new type of glass allowed the move of the glass-ovens from densely forested regions, such as Hainaut, in which *Wald*-glass was made on the basis of locally available woods, to a city like Antwerp, which relied on the import of coastal plant ashes through its global trade networks.

Venetian knowledge of glass-making was imported by Italian merchants who set up their ovens and shops in Antwerp and who brought with them Italian glass-makers who possessed the know-how of the making of *crystallo* glass.¹⁶ After several unsuccessful attempts to establish glass-ovens for the production of *façon*

¹² Vermeulen, *Painting for the Market*, 19-28.

¹³ *Ibid.*, 127-39. See also Denissen, "Het glazenmakersambacht," 15-30.

¹⁴ For *crystallo* glass composition and quality in Venice, see Mandò, Mercatelli, Molesini, Vannoni and Verità, "The Quality of Galileo's Lenses," 78-85.

¹⁵ See El-Dekmak-Denissen, "Glas," 15.

¹⁶ For the establishment and history of the Antwerp glass industry, see Veeckman and Dumortier, "La production de verres à Anvers," as well as other papers in this volume discussing the archaeological evidence. Older but still useful is Hudig, *Das Glas*, 14-17.

de Venise glass in Antwerp in the 1530s, the city of Antwerp awarded in 1542 a considerable sum of money to the Italian Giovanni Cornachini to establish Antwerp's first workshop producing the highly demanded *crystallo* mirrors, for which Murano had gained world-wide fame. When in 1558 Giacomo Pasquetti, an Italian merchant from Brescia, acquired from the Venetian Giacomo di Francesco the patent – and thus the monopoly – to produce crystalline glass in Antwerp, this was the beginning of a period of flourishing of Antwerp's *façon de Venise* glass industry.

The fall of Antwerp in 1585 undoubtedly created a more negative economic climate, and because of the religious troubles, painters and many other producers of luxury goods left Antwerp. In 1592 Ambrogio Mongardo, the successor to Pasquetti as the head of Antwerp's *façon de Venise* glass industry, complained that many of his highly skilled workers were secretly solicited to come to London, or Middelburg where a merchant, Govaert van der Haeghen, formerly based in Antwerp, had recently established a glass industry.¹⁷ However, by this time, Antwerp's economy was already showing a modest recovery. On the one hand, Antwerp fulfilled its role as a *Dispositionsplatz*, which means that the goods were actually not physically present in the city: merchants relied on their international network of business contacts, in which they were helped by the Diaspora of Antwerp merchants which had preceded. On the other, in spite of the migration

¹⁷ Mongardo first complained about the competition from London and Middelburg in his request to the City of Antwerp in 1581: "[...] nevertheless it has come to our knowledge that a certain Govaert Verhaegen, coming from England, recently received from the Council of Zeeland, residing in Middelburg, or from the Law there, the privilege and the permission to establish ovens in this same city of Middelburg, and also to make there glass in the Venetian manner [...] much to the disadvantage and the detriment of the applicants" / "[...] nochtans es tot huerlieden kennisse gecommen dat eenen Govaert Verhaegen, commende vuyt Engelant, soude onlanx vercregen hebben van die vanden Rade in Zeelandt, residerende tot Middelborch, oft van die vander Weth aldaer, oirloff ende consent om binnen deselve stede van Middelborch te mogen oprechten, fournaisen ende aldaer oick maecken gelaesen opde voirs. maniere van Venegien [...] tot grooten achterdeele ende schaede vanden supplianten [...]" In 1592 Mongardo repeats his earlier complaints more forcefully: "Moreover, the masters are also secretly solicited and requested to come to work in London in England and likewise in Zeeland, where since briefly ovens [to make] crystal [glass] have been established to draw away the art from here [Antwerp] [...] which would cause the total ruin of the applicant and his household [...]" / "Bovendyden soe worden de meesters oyck secrteycken gesolliciteert ende aensocht, ten eynde zy tot Londen in Engelant ende disgelycx in Zeelandt souden comen wercken, alwaer tzedert corten tyt cristalyne fournaisen syn gedresseert ende opgericht, om de conste van hier te trecken [...] al dwelck soude causeren de totale ruine des suplicants ende zyn huysgesin [...]" Génard, *De oude Antwerpsche glasblazerijen*, 43, 53-54. Hudig, *Das Glas*, 16; Denissen, "Overzicht," 13. For the glass industry in Middelburg, see De Waard, *De uitvinding*, 105-114.

of skills to the north about which Mongardo complained, Antwerp continued to flourish as a centre of the luxury industry. The Twelve-Year Truce, signed in April 1609, even marked the beginning of Antwerp's 'Indian Summer'. The manufacture and trade of some types of luxury goods thrived in this period. During the directorship of Sara Vinckx, Mongardo's widow, who later re-married the Italian Filippo Gridolphi, the Antwerp glass industry flourished in the last years of the sixteenth century and the first years of the seventeenth as never before. During this period the building where the glass-ovens were in operation, the *Gelaesenhuys* at the Meir, was enlarged as to make room for two additional Italian master-glassblowers, bringing their total number to eight.¹⁸ Only after Gridolphi's death in 1625 did the decline of Antwerp's *façon de Venise* glass industry set in.

Thus, despite the economic, religious and political troubles of the second half of the sixteenth century, Antwerp continued to flourish as a centre of manufacture and trade of luxury goods well in to the seventeenth century. The immigration of foreign – and in the case of luxury glass (but not only), Italian – knowledge of the making of luxury goods was essential to this economic success. Antwerp's position in the global trade networks (even after 1585 it continued to be important for the trade with the Iberian Peninsula) thus also attracted foreign merchants to the city. They were partly the driving force behind the production of luxury goods, as we have seen. But they were also partly – beside the local wealthy elite – responsible for the consumption of luxury goods. In what follows I will discuss the culture of collecting in early seventeenth-century Antwerp with an eye towards the mercantile collections for which luxury goods were sometimes acquired. In particular, I will be interested in the relation between the collections and the pictures of collections, a newly invented luxury good. While Antwerp relied on the immigration of foreign skills to establish luxury industries in the sixteenth century, in the early seventeenth century Antwerp became a producer of luxury goods, such as pictures of collections, which were a local invention.

Ignorance, the Consumption of Knowledge and Collections

The collection of Emanuel Ximenez shows how the spheres of commerce, luxury glassworks, and natural knowledge were connected in early seventeenth-century Antwerp.¹⁹ The Ximenez family was one of the wealthy Portuguese merchant-

¹⁸ El-Dekmak-Denissen, "Glas," 17.

¹⁹ The collection of Emanuel Ximenez is the subject of a collaborative project with Christine Göttler. This project deals more extensively with the Ximenez family than can be discussed here.

bankers families who resided in Antwerp from the mid-sixteenth-century for several generations. They were active in global trade of bulk products and luxury goods (sugar and spices, jewellery and books, etc.) and in monetary transactions with the Spanish Crown (*Asiento's*).²⁰ The Ximenez family had offices in numerous cities including Lisbon, Seville, Venice and Hamburg, and close ties to the court in Madrid and the Medici in Florence.²¹ In Florence Ximenez met the priest Antonio Neri, whom he later hosted in Antwerp. During his stay in Antwerp Neri observed the work in the *façon de Venise* glass factory of Gridolphi, since Gridolphi and Ximenez were neighbours (Ximenez's house was located at the Meir, an extremely wealthy area of the city, where Gridolphi's *Gelaesenhuis* was also found). Partly on the basis of his experience in Gridolphi's ovens Neri published *L'arte vetraria* in 1612, the first book to discuss the manufacturing of *façon de Venise* glass. The correspondence of Ximenez and Neri, which was only interrupted during Neri's visit between 1604 and 1611, shows that they shared an interest in Paracelsian alchemy and medicine.²² One of the rooms in Ximenez's house was equipped as a laboratory ('distillation and alchemy chamber'). As we will see below, this same house contained the most splendid collection and library to be found in early seventeenth-century Antwerp.

The extent to which the spheres of commerce, the manufacture of luxury glass and collecting mixed in Ximenez's house is, to the best of my knowledge, unique in early seventeenth-century Antwerp. Ximenez's collection shows how the consumption of luxury goods went together with an interest in the bodies of knowledge involved in the production of luxury goods – in the case of Ximenez, glass – but we will see below that his epistemic interests reached beyond glass and alchemy to other luxury goods (such as mathematical instruments) and the accompanying bodies of knowledge. This combination was not unique to Ximenez; instead, we will see that it is a recurring characteristic of collectors, and as such,

²⁰ Pohl, *Die Portugiesen*, in particular for their commercial activities, 78-83; with a family tree at 357.

²¹ Fernão Ximenez, Emanuel's uncle, established a commandery of the Order of Saint Stephen in Antwerp. This military and religious order was founded by Cosimo de' Medici. The Order was irrevocably linked to the Medici, because papal bulls stipulated that the Grand Dukes of Tuscany held its Grand Magistry. Emanuel inherited the patronage of the commandery from Fernão. See Pohl, *Die Portugiesen*, 327. The Ximenez family also supplied influential members of the Florentine bureaucracy. For example, in the first decade of the seventeenth century Manuel Ximenez, another uncle of Emanuel and a Jesuit priest in Florence, and Niccolò Ximenez, a senator in Florence, were involved in the failed attempts of the Grand Dukes Ferdinando and Cosimo II to buy Sierra Leona from the Spanish Crown. See Hair and Davies, "Sierra Leona," 61-69.

²² Galluzzi, "Motivi paracelsiani," 31-62; for the Neri-Ximenez correspondence, see 50-51.

telling of the culture of collecting in early seventeenth-century Antwerp. Moreover, the presence of a laboratory in Ximenez's house suggests an interest in a particular type of knowledge – that acquired by the tactile engagement with objects and materials. Again, this will be confirmed by other collections, and by pictures of collections.



Figure 1: Frans II Francken, *Banquet in the House of Burgemeester Nicholas Rockox*, 1630-5. (Munich, Bayerische Staatsgemäldesammlungen)

The pictures of collections will help us to understand why early seventeenth-century collectors in Antwerp brought together objects in a collection. But let us first turn to another aspect of the relation between the collections and the pictures of collections: are these pictures faithful to the actual collections brought together in Antwerp in the same period? The paintings of collections strike us by the juxtaposition of paintings, *naturalia* (for example, the shells displayed on the table in lower left corner of the painting of Antwerp burgomaster Nicholas Rockox's cabinet; see Figure 1) and *artificialia* (for example, the mathematical instruments, globes or telescopes and other visual aids on Pieter Paul Rubens' and Jan Brueghel the Elder's *The Sense of Sight*, see Figure 2). While these paintings seemingly give us a privileged insight in the early seventeenth-century collecting practices in Antwerp, art historical scholarship warns us against taking these paintings at face value as evidence of existing collections. Zirka Filipczak,



Figure 2: Jan I Brueghel and Peter Paul Rubens, *The Sense of Sight*, 1618. (Madrid, Prado)

for example, has claimed that the presence of *naturalia* and *artificialia* was the product of the painters' artistic liberty, because encyclopaedically organized displays on a large scale had not existed in Antwerp during the early seventeenth century.²³ If Filipczak is right, this would point to a significant difference between Antwerp and contemporary collections in the Dutch Republic, which did contain *naturalia*.²⁴ There is, however, evidence to the contrary.

If one relies on the inventories as published by Jan Denucé in *De Antwerpsche 'konstkamers'* (1932) the impression one gains is indeed that in the early seventeenth century the only existing collections were those of paintings only.²⁵ Erik Duverger's more recent publication of the inventories of Antwerp households

²³ Filipczak, *Picturing Art*, in particular 65.

²⁴ For *naturalia* in collections in the Dutch Republic, see (among others) Goldgar, *Tulipmania*, in particular chapter 2, 62-130; Jorink, *Het Boeck der Natuere*, 267-360; Swan, "Making Sense of Medical Collections," 199-213. Interestingly, Claudia Swan shows how the collection of the Leiden pharmacist Christiaan Porret resembled a *Kunstkammer* in that it not only contained items relating to medicinal preparations, but in addition to these *naturalia*, numerous ethnographic objects and *scientifica*. This is not to say that differences between the north and the south were non-existent. As to images of objects – in turn objects for collections – Honig argues that "no easy art historical connection exists to link Dutch imagery of things to their status as objects of commercial exchange and value, as does exist (if negatively) in the art of Antwerp." See Honig, "Making Sense of Things," 172. Older but still useful are Van Gelder, "Noordnederlandse verzamelingen," 123-44; Scheller, "Rembrandt," 81-147.

²⁵ Denucé, *De Antwerpsche 'konstkamers'*.

in the seventeenth century, however, makes clear that Denucé systematically left out all objects other than paintings. The inventories as published by Duverger show that the paintings of collections do not represent actual collections in the sense that, unlike Denucé's notion of 'const-kamer' suggests, the collected objects were often scattered over the different rooms in early seventeenth-century houses. But the paintings were more faithful to the actual content of collections than Filipczak assumed. Besides the important collections of the merchants Nicolaes Jongelincx and Diego Duarte, which indeed were collections of paintings only, Antwerp housed many collections with a more diverse range of objects.²⁶ For example, the famous cartographer and antiquarian Abraham Ortelius displayed a collection of paintings, sculpture, Greek and Roman coins, shells and minerals in his house.²⁷ The inventory of the collection of Antwerp burgomaster Nicholas Rockox at the moment of his death in December 1640 lists not only paintings, books and antiquities, but also the *naturalia* which Frans Francken depicted in his painting of this collection (see Figure 1, above).²⁸ Rockox's study contained a collection of shells.

The inventories of Antwerp households of the seventeenth century show that paintings were the luxury goods that were owned in higher numbers than any other type of objects. However, other luxury goods such as *façon de Venise* glasswork, and *naturalia* and *exotica* were also often found, even in isolation, that is when no or few other objects, especially paintings, were collected. Let me give a few examples. In 1629 Johannes Bol displayed in the study above his shop a small collection of books, a few maps and two telescopes.²⁹ Among the *naturalia* found in the inventories are elephant tusk, sea shells, crocodiles, birds, *herbaria* and other

²⁶ Buchanan, "The Collection of Nicolaes Jongelincx I," 102-13; Buchanan, "The Collection of Nicolaes Jongelincx," 541-50; Dogaer, "De inventaris van Diego Duarte," 195-221; Vlieghe, "Une grande collection anversoise," 172-204. Jaap van der Veen's discussion of collections of paintings in the Netherlands is useful, but repeats the traditional contrast between collections of *naturalia* in the northern Netherlands versus collections of paintings in the southern Netherlands. See J. van der Veen, "Galerij en kabinet," 145-64. For the collection of Cornelis van der Geest, see Peterson, "The Five Senses of Cornelius van der Geest."

²⁷ Büttner, "De verzamelaar Abraham Ortelius," 169-80. See also Meganck, *Erudite Eyes*. For collecting material and visual evidence in the context of the related antiquarian and numismatic interests of Justus Lipsius, see Papy, "An Antiquarian Scholar," 97-131. It is worth noting that Lipsius sometimes appears amongst the *cognoscenti* depicted in Antwerp pictures of collections.

²⁸ The inventory mentions "diversche Zeusche schelpen van veel couleuren" in the study (*comptoir*). For the inventory of Rockox's house, see Duverger, *Antwerpse kunstinventarissen*, vol. 4, 382-87, 386. For the paintings in Rockox's collection, see Van de Velde, "De schilderijencollectie," 33-56.

²⁹ Duverger, *Antwerpse kunstinventarissen*, vol. 3, 155-56.

cruydtboecken, a piece of a whale found in the river Scheldt, and wolf teeth. An inventory of 10 April 1614 shows that Filips van Valckenisse, a friend of Rubens, possessed dozens of shells of different sizes and colours.³⁰ In 1617 the collection of the painter Frans I Francken contained (as is to be expected) paintings, but also shells and, especially, two large *kieckhorens*, a type of seashell that was much in demand.³¹ In the shop of the apothecary Abraham van Horne, who died on 18 August 1625, a crocodile hung down from the ceiling, while also a snake, a turtle, a *vischtonge*, and an ostrich egg (*struyseye*) were displayed, providing us with a picture of an apothecary's shop more familiar from contemporary Italian examples.³² Thus, the inventories show that a whole range of other objects besides paintings were found in the houses of Antwerp's merchants, apothecaries, craftsmen and painters.

Furthermore, in contrast to Filipeczak's claim, the inventories point to the existence of several collections containing mathematical instruments only as well as collections juxtaposing *artificialia* and *naturalia* in early seventeenth-century Antwerp. Let me mention two splendid examples of this type of collection. At the time of his death in 1652 Jan van Meurs, an alderman of the city of Antwerp during the last years of his life, and otherwise printer and bookseller as well as a member of the Guild of Saint Luke, was the proud owner of a *blomhoff* or garden in which fig, pomegranate and orange trees grew. In this garden one could also find a cabinet with a few landscape paintings, a collection of seashells "and other similar curiosities." Inside his house the visitor could admire a collection of paintings, exotic objects (such as 'Indian antiquities'), more shells, mirrors, a snake, a clock made of rock crystal, corals, two globes, yet another clock, a compass and a pair of dividers, and an astrolabe.³³

Undoubtedly, though, the most splendid example of this type of collection is that of Emanuel Ximenez. In May 1617, at the moment of the death of his wife, Isabella da Vega (of another Portuguese merchant-bankers family residing in

³⁰ The inventory listed "een koffer met zeeschelpen" in a room upstairs on the side of the street, and elsewhere, together but organized to size, more than fifty shells. See Duverger, *Antwerpse kunstinventarissen*, vol. 1, 299-311. For Filips van Valckenisse and Rubens' entry in his *album amicorum*, see Muller, "De verzameling van Rubens," 15-17.

³¹ Duverger, *Antwerpse kunstinventarissen*, vol. 1, 388-94.

³² *Ibid.*, vol. 2, 432. For Italian examples, see Findlen, *Possessing Nature*.

³³ The inventory lists "een houten reek met diversche Indiaensche antiquiteijten," and in the garden "dry granaetboomen, dry vygeboomen, eenen grooten oraingerienboom [...] ses teylen met jonge oraingieboomkens [...]," and the *Achtercamerken op den Hoff* two landscape paintings and "een weecke casse met cieckhoorens ende andere diergelijcke rariteijten." Duverger, *Antwerpse kunstinventarissen*, vol. 6, 264-69.



Figure 3: Michiel Coignet, *Nocturnal and sundial*, 1598 [brass, diameter 108 mm]. (Museum of the History of Science, University of Oxford, inv. 44721)

Antwerp), *naturalia* and *artificialia* were brought together in the same room: two globes, exotic animals, a crocodile, several maps, instruments to draw in perspective and other mathematical instruments, a sundial made by the Antwerp mathematician and instrument-maker Michiel Coignet (see Figure 3), another wooden instrument to draw in perspective, a small copper astrolabe, a wooden Jacob's staff, a wooden instrument for surveying, a telescope in three parts and coated with leather, two burning mirrors and three eyeglasses together in a wooden box, two prisms, an instrument for dialling, and so on.³⁴ In another room of the house, in which several paintings hung on the walls, including a work by Rubens and a large *cristallo* mirror in an ebony frame, diverse mathematical instruments were again displayed. In the study, several objects were brought together, including a quadrant and a large astrolabe, both made by Coignet (see Figure 4). Ximenez's taste for instruments does perhaps point us to a difference with collections in the north. In contrast to the cosmopolitan acquisition policies in the Dutch Republic, collectors in Antwerp cultivated a local canon of painters. Ximenez's fondness for Coignet instruments, and possibly other Flemish instruments through the family's contacts with Plantin, suggests that we are allowed to extend this preference to instruments.³⁵

Local makers (whenever identifiable, mostly Blaeu and Hondius), were also responsible for the terrestrial and celestial globes found among the objects depicted in the paintings of collections.³⁶ In a corner of the cabinet of Cornelis van der Geest (Figure 5), cosmographers take measurements on a globe. The pose would have reminded Antwerp's wealthy collectors of a moral lesson not to indulge in their desires for riches and luxury goods, more explicitly present (as is

³⁴ Duverger, *Antwerpse kunstinventarissen*, vol. 1, 400-61. For Michiel Coignet, see Meskens, *Familia Universalis*, 51-145.

³⁵ Plantin was a friend of the Ximenez family whose members occasionally acted as brokers and patrons of Plantin's publication projects. See e.g. Sellink, "As a guide," 40-56, and the correspondence cited there in n. 37. For the letter of Jan Moretus to Fernão Ximenez on Plantin's death, see *Correspondance de Christoph Plantin*, vols. 8-9, 559-62. The Plantin press traded not only in books, but also in Flemish mathematical instruments of makers such as Mercator and Arsenius. For example, the Plantin firm shipped Flemish instruments to Spain, including Philip II's collection of scientific instruments in the Escorial, using the Spanish theologian Benito Arias Montano, who collaborated with Plantin on the *Polyglot Bible* while he resided in Antwerp, as a middleman. See Van Cleempoel, "Philip II's Escorial," 116-23.

³⁶ I thank Peter van der Krogt for his help in identifying some of the globes. See Van der Krogt, *Globi neerlandici*. See also Depuydt, "Aard- en hemelglobes," 1-8 and, for an example of a Hondius globe in an Antwerp cabinet painting, see Gorman and Marr, "Others See it yet Otherwise," 85-91.



Figure 4: Michiel Coignet, Astrolabe, 1601 [gilt brass, diameter 227 mm]. (Leiden, Museum Boerhaave, inv. 3105)



Figure 5: Willem II van Haecht, *The Cabinet of Cornelis van der Geest*, 1628. (Antwerp, Rubenshuis)

the pose) in Pieter Brueghel the Elder's *Temperantia*.³⁷ But the globes also reflect the involvement of Antwerp's merchant-collectors in global trade networks and refer to the navigational and cartographic knowledge on which their commercial activities depended. In one of these paintings of collections (Figure 6), a *liefhebber* takes measurements on a celestial globe, while two other *liefhebbers* gather around a table to investigate and talk about a set of maps and a book of coastal profiles, perhaps those of Blaeu's *Licht der Zeevaart*.

Equally remarkable in the case of the globe is the tactile engagement with objects, even if the pose is admittedly stylized. Globes were not the only objects to elicit tactile engagement in paintings of collections: paintings, too, were in the beholders' hands (see Figure 7).³⁸ *Liefhebbers* are portrayed in the act of picking up a painting and discussing it while holding it in their hands. Something

³⁷ Härting, "Doctrina et pietas," 104-11.

³⁸ For the tactile dimension of pictures of collections see Gage, "Some Stirring," and Peterson, "The Five Senses of Cornelius van der Geest."



Figure 6: Workshop of Frans II Francken (?), *Cabinet of a Collector*, c. 1615-20. (Madrid, Prado)

similar could be argued for contemporary books on cosmography. The paper instruments in those books (Figure 8), perhaps most famously in Peter Apian's and Gemma Frisius's multiple editions of *Cosmographia* produced in Antwerp and found, for example, in Ximenez's library, invited the reader to tactile engagement and interaction.³⁹ Moving the paper parts helped the reader to understand basic mathematical relations in cosmography.⁴⁰

Ximenez also had an impressive library. A majority of the books were on chemistry, mathematics, astronomy, medicine, and natural history, in Latin and in half a dozen vernacular languages.⁴¹ That ownership of a considerable number of mathematical and optical instruments went together with a library on issues of natural and mathematical knowledge is a pattern that is confirmed by other col-

³⁹ Ximenez owned two editions of *Cosmographia* (1581, 1584). Duverger, *Antwerpse kunstinventarissen*, vol. 1, 438.

⁴⁰ On paper instruments, see Vanden Broecke, "The Use of Visual Media," 130-50; Gingerich, "Astronomical Paper Instruments," 63-74.

⁴¹ Duverger, *Antwerpse kunstinventarissen*, vol. 1, 434-61.

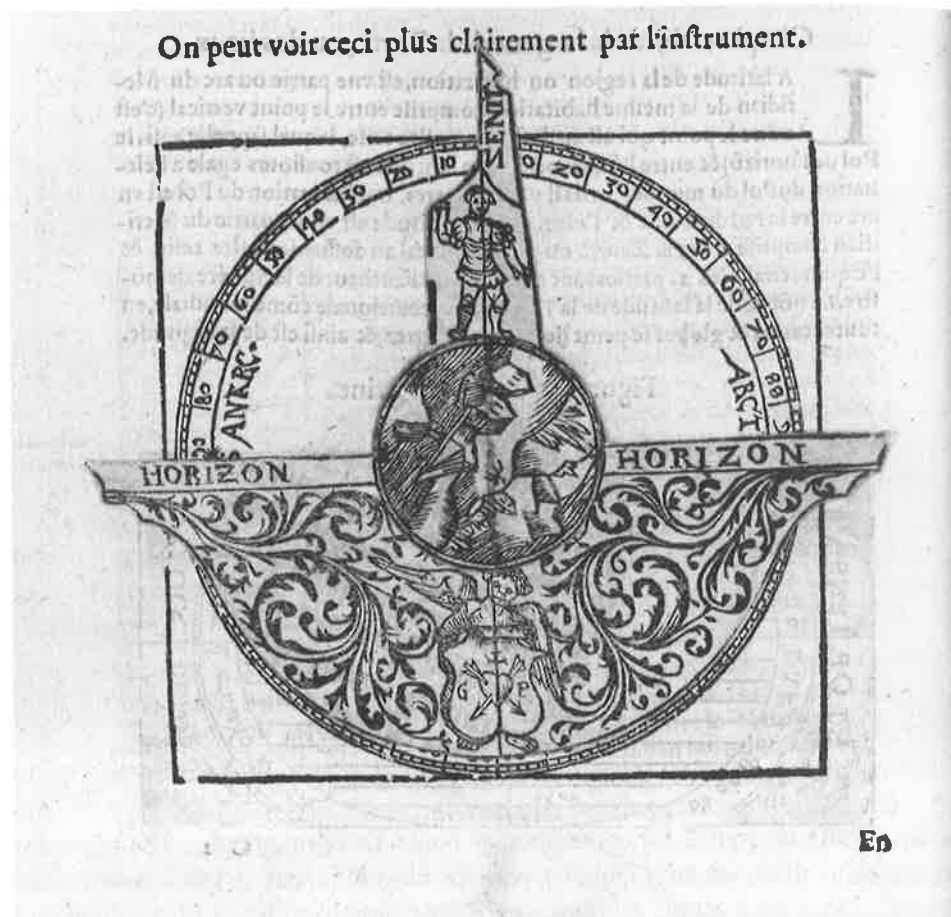


Figure 7: Petrus Apianus and Gemma Frisius, *Cosmographie ou description des quatre parties du monde* (Antwerp: I. Bellere, 1581), p. 20. (Ghent University Library, BIB.182B13)

lections in early seventeenth-century Antwerp.⁴² In 1619 Marcus Voitier, a priest, owned a collection which is remarkable by the almost complete absence of paintings and *naturalia*.⁴³ He possessed eyeglasses, compasses, several kinds of mathematical instruments, and an important collection of mathematical books, which included works of Daniel Speckle, Regiomontanus, Oronce Finé, Sebastian Mün-

⁴² However, this is not to say that ownership of books was widespread in Antwerp in this period. Ria Fabri has calculated that only 6.6% of inventories of Antwerp houses in which one or more objects of art were displayed listed one or more books. See Fabri, "Diversche boeken," 9-27. Then again, Rockox's library illustrates that ownership of a considerable number of objects other than paintings in a collection went together with a library on issues of natural knowledge.

⁴³ Duverger, *Antwerpse kunstinventarissen*, vol. 2, 49-54.



Figure 8: Frans II Francken, *Cabinet of a Collector*, c. 1612-16. (Munich, Bayerische Staatsgemäldesammlungen)

ster, Peter Apian and Giovanni Paolo Gallucci. In 1625 Gillis de Kimpe, a notary, had an important collection of prints and paintings, *exotica*, sea shells, corals, a turtle and other *naturalia*, a telescope and a sundial, and a library of 405 books of all sizes and in diverse languages.⁴⁴ The fact that a collector possessed a library with books on issues of mathematical and natural knowledge, related to the instruments and other objects in his collection suggests that the owner wished to understand the objects, and that mathematical instruments were perhaps manipulated in his collection.⁴⁵

Thus, it seems that collectors in early seventeenth-century Antwerp eagerly sought after luxury goods (paintings, mathematical instruments, globes and glass-

⁴⁴ The books are not listed: "405 boecken soo cleyn als groot van verscheyden taelen." *Ibid.*, vol. 2, 399-415, 399.

⁴⁵ We see similar patterns of collecting objects and books on the making and use of these objects, and displaying them together, in the *Kunstammer* in Dresden. There, evidence is strong that instruments were manipulated, even by the Electors. See Dupré and Korey, "Inside the Kunstammer," 405-20.

work, etc.), but not only for the purpose of displaying wealth. They were also interested in the luxury goods as objects of knowledge. Just as wealthy merchants in the period took lessons in drawing from artists to develop a good eye to judge paintings, collectors were also interested in acquiring the bodies of knowledge – mathematical, natural, alchemical, medical – that would allow them to understand and judge other objects in their collections.⁴⁶ This consumption of knowledge was a vehicle of social cohesion and mobility. Antwerp's wealthy merchants aspired to acquire aristocratic status, and in case they failed in this attempt, at least to imitate aristocratic ways of life. In 1584 Ximenez requested a correspondent to send him seeds of some New World flowers cultivated in the garden of the Escorial, the palace of the Spanish King Philip II.⁴⁷ Likewise, Ximenez's laboratory must have been modelled after the ducal *fonderia* of the Medici situated inside the Palazzo Vecchio, and later Palazzo Pitti, which functioned as a chemical and pharmaceutical laboratory, a forge and an arsenal for several generations at the Medici court.⁴⁸ In Florence, the alchemically interested Don Antonio de' Medici was the patron of Ximenez's friend Neri.

Court collections, then, functioned as ideal images of the collections of a wealthy merchant like Ximenez in early seventeenth-century Antwerp. Pictures of collections fulfilled a similar role. The pictures of collections were more faithful to the type of collections found in contemporary Antwerp, but their ambition was nevertheless not representational. Elizabeth Honig has argued that "the gallery picture did not represent the collection of which it was a part; rather, it served as the image of an ideal to which both the collection itself, and the activities that took place in the real 'const-camer', could be compared."⁴⁹ What the paintings of collections tell us about the actual collections is that they were places where friendship was celebrated. They were not unlike that other collection, Ortelius' *album amicorum*, reflecting his network gathered through trade and learning, a celebration of friendship (i.e. civility and learning), "intended as a bastion against time and trouble, an attempt to salvage a sense of stability and civility in a period of social and cultural disintegration."⁵⁰

A contemporary description of the collection of a family member of Ortelius illustrates this well. The biography of the Antwerp merchant Emanuel van Me-

⁴⁶ For merchants learning how to draw, see Goldgar, *Tulipmania*, 120-21; Marr, *Between Raphael and Galileo*, Chapter 3.

⁴⁷ Pohl, *Die Portugiesen*, 331.

⁴⁸ Butters, *The Triumph of Vulcan*; Devlieger, *Benedetto Varchi*, 203-9.

⁴⁹ Honig, *Painting and the Market*, 203.

⁵⁰ Harris, "The Practice of Community," 315. See also Harris, "Het *Album Amicorum*," 117-35.

teren by his friend Simeon Ruytinck, pastor of the Dutch nation in London, in an appendix to a posthumous edition of his *Historie der Nederlanscher . . . Oorlogen en Geschiedenissen* (1623), portrayed his collection as a place of friendship and conversation. Van Meteren fled Antwerp because of the war and settled in London, where he became Consul of the Netherlandish traders. He was the nephew of Abraham Ortelius, and counted among his friends – all of whom signed his *album amicorum* – the painters Joris Hoefnagel and Lucas d'Heere, the merchant-humanist Johan Radermacher, and the learned men William Camden, Carolus Clusius, Iacobus Colius Ortelianus and Justus Lipsius, among many others.⁵¹ In his biography we read that during his illness, preceding his death in London in 1612, merchants and "other good friends in great numbers" still came to visit him, and that on those occasions, Van Meteren "thanked them for their entertaining conversation in the past." Moreover, "he also wanted to see for once his medals, foreign coins, shells and other rarities, with which he sometimes (after his ordinary labour) used to entertain, although he said that such was nothing but vanity [. . .]."⁵²

In this connection, and especially with regard to the paintings in the collections, it has been noted that the *liefhebber* had to demonstrate his ability to talk about art to be allowed to participate in the community of connoisseurs – an observation that, I would argue, should be extended to the other types of objects, such as the *naturalia* (as is evident in the description of Van Meteren's collection just cited), the *exotica*, and the mathematical and optical instruments.⁵³ Appropriately, the latter objects are prominently displayed in the *Linder Gallery Interior*, recently discussed by Michael John Gorman and Alexander Marr.⁵⁴ The painting celebrated the shared – i.e., mathematical – knowledge on which the community of *liefhebbers* was built. If the pictures of collections are the ideal to which the

⁵¹ *Album Amicorum Emanuelis de Meteren Mercatoris Antverpiani* [Oxford, Bodleian Library, MS Douce 68]. For the perhaps least well-known friend in this company, Johan Radermacher, see Bostoën, *Bonis in bonum*.

⁵² "[. . .] durende sijn sieckte, soo nam hy seer vriendelick oorlof aende coopliden ende andere goede vrienden, dien hem in grooten ghetale quamen besoecken, ende bedacktese voor haer voorgaende vermaeckelicke conversatie, hy wilde oock noch eens besien sijn medaillen, vrende munten, schelpen en andere selsaemheden, daer in dat hij hem somtijds (na sijnen ordinaren arbeydt) plagh te vermaecken, doch seyde dat sulcks al maer ydelheit en was [. . .]." Van Meteren, *Historie*, cited from the appendix: "Het leven ende sterven van eerweerdigen, vroomen ende vermaerden, Emanuel van Meteren: Kortelijck beschreven door sijnen ghetrouwen vriendt Simeon Ruytinck."

⁵³ Honig, "The Beholder," 280.

⁵⁴ See Gorman and Marr, "Other see it yet otherwise"; Marr, *Between Raphael and Galileo*, Chapter 6.

actual collections aspired, then collectors in early seventeenth-century Antwerp did not aim to display wealth by acquiring luxury goods, but instead by acquiring luxury goods to argue for the high value to be placed on knowledge – knowledge on which the making of the luxury goods, as much as decisions about their acquisitions, depended.

Thus, for the merchant-collectors in Antwerp knowledge, as embodied in luxury goods, was a vehicle of friendship and social mobility. We should note, though, that pictures of collections show that there also was a religious angle to collecting objects of knowledge in early seventeenth-century Antwerp. In Rubens' and Brueghel, Jan I's *The Sense of Sight* (Figure 2) mathematical instruments, visual aids and a telescope figure prominently as objects of mathematical and optical knowledge. The painting argues, however, that this knowledge was to be put in the service of *pietas*. From the monkey with eyeglasses and the telescope the beholder's gaze is drawn to a depiction of the Madonna and a painting showing the healing of the blind. According to Justus Müller Hofstede, Brueghel, Jan I and Rubens show here different stages of vision, from terrestrial vision to the contemplation of divine truth.⁵⁵ More explicit religious references to the iconoclastic movement of 1566, when Calvinists cleansed most of the churches in the Netherlands of their images, are found in other pictures of collections. In several of these paintings knowledge is contrasted to ignorance, personified by iconoclastic donkeys, which smash and destroy paintings, mathematical instruments and other collectables carrying knowledge (see Figure 8).⁵⁶ Yet again, the paintings of collections argue for the high value that is to be placed on knowledge. By making use of references to the iconoclastic movement the pictures emphasize that this knowledge is to be acquired through familiarity with objects.

Art Cabinets, Glass and Optical Knowledge

The fashionable art cabinets produced in Antwerp in the first half of the seventeenth century carried a similar message about the high value of knowledge (see Figures 9 and 10). Their production arose in the same economic context as that of the pictures of collections. After the blockade of the Scheldt manufactures and merchants re-oriented the Antwerp economy towards the export of luxury goods. Cabinetmakers, too, began targeting a wealthier buying public. The art cabinets produced in Antwerp were exported, especially to the Iberian Peninsula, through



Figure 9: Art cabinet, mid-17th century [160 cm x 110 cm x 47 cm]. (Antwerp, Museum Rockox, KBC Bank NV, Erwin Donvil, inv. 77.144)

the networks of the art firms of such families as Forchondt and Musson.⁵⁷ Collectors bought these cabinets to display small statues and crucifixes, shells and other *naturalia*, clocks and astrolabes.⁵⁸

If not exported, art cabinets were available for sale in local shops of art dealers, such as that of Cornelis de Wael, a merchant of ebony and mirrors, appropriately

⁵⁵ Hofstede, "Non Saturatur Oculus Visu," 243-89.

⁵⁶ Härting, "Doctrina et pietas," 123-128. For the donkey as a symbol of ignorance, see Weber, "Poetenhafer," 87-89.

⁵⁷ Fabri, *De 17de-eeuwse Antwerpse kunstkast*, 161-70.

⁵⁸ *Ibid.*, 184-88.



Figure 10: Art cabinet, ca. 1650 [160 cm x 108 cm x 49.5 cm]. (Amsterdam, Rijksmuseum, BK-NM-4789)

named *den Veneetsen Spiegel* (or ‘The Venetian Mirror’), whose shop was located at the Steenhouwersvest in Antwerp.⁵⁹ Ebony and mirrors, indeed, were the two most important materials from which Antwerp art cabinets were made. Like other luxury industries, the manufacture and trade of ebony cabinets in Antwerp depended on the importation of foreign skills and entrepreneurs. The place of origin of the Antwerp ebony cabinet was likely Augsburg, which had a reputation as the cradle of the southern German art cabinet.⁶⁰ In fact, the first ebony workers to set up in Antwerp were German. Nevertheless, like the pictures of collections, a genre

⁵⁹ *Ibid.*, 163.

⁶⁰ De Munck, “Construction and Reproduction,” 94-95. Perhaps most famous were the cabinets assembled by the Augsburg art dealer Philipp Hainhofer, on which see Hauschke, “Scientific Instruments,” 49-55. See also Letocha, “The Augsburg Art Cabinet,” 9-13.

invented in Antwerp, the Antwerp art cabinets were products of local invention. Antwerp art cabinets had a *perspectieffe* or perspective (Figure 11), made of *façon de Venise* mirror glass, a design feature that differentiated them from art cabinets produced elsewhere. Thus, Antwerp ebony cabinetmakers re-used a luxury good of Italian origin (*crystallo* glass) in combination with a luxury cabinet of southern German origin to invent a new luxury good – an art cabinet with perspective – that argued that high value was to be placed on knowledge.⁶¹

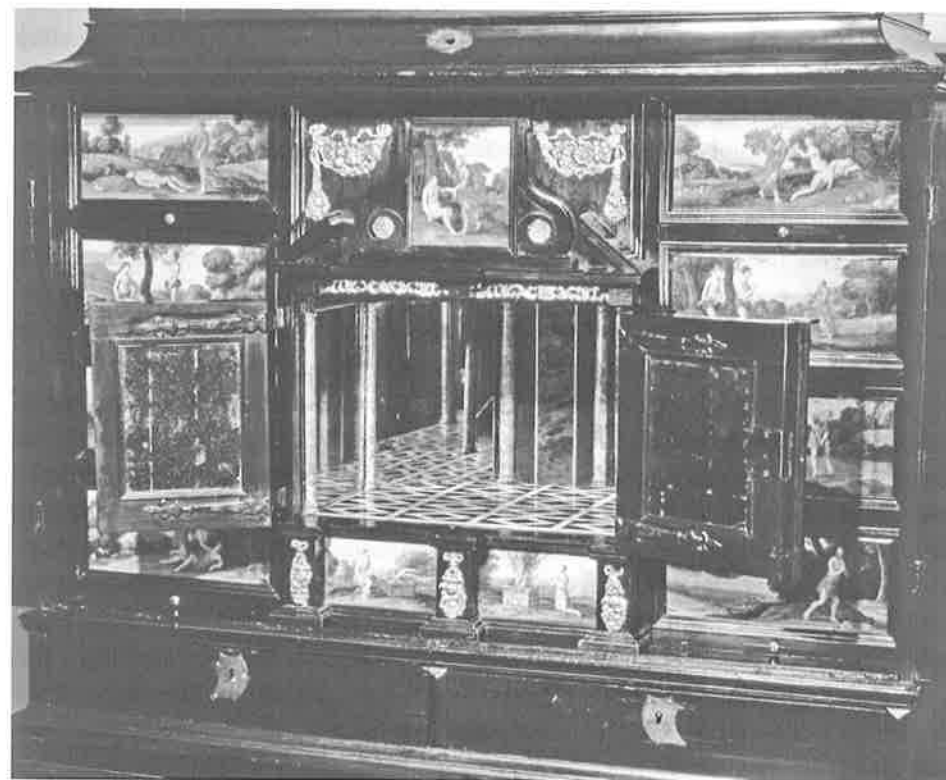


Figure 11: Art cabinet, ca. 1650 [160 cm x 108 cm x 49.5 cm]. (Amsterdam, Rijksmuseum, BK-NM-4789, detail: perspective)

The most important category of craftsmen working on the Antwerp art cabinets was that of the carpenters specialized in working with ebony.⁶² Ebony workers belonged to the carpenters’ guild or to the Guild of Saint Luke (to which the

⁶¹ Likewise, the art cabinets re-used (borrowed) existing designs and paintings of Rubens, and from the workshop of Frans II Francken. See Fabri, *De 17de-eeuwse Antwerpse kunstkast. Kunsthistorische aspecten*, 14-80.

⁶² *Ibid.*, 112-44.

mirror-makers also belonged), and these two guilds competed about who was allowed to work on the art cabinets.⁶³ But the ebony workers were by no means the only craftsmen to work on art cabinets. In contrast to the high-level collaboration on Antwerp paintings of collections, such as that between Brueghel, Jan I and Rubens (a collaboration which made these paintings attractive to an audience willing to show off its expertise in recognizing the different hands in a painting), the Antwerp art cabinets were a collaborative effort of lower level artists and craftsmen.⁶⁴ In addition to cabinetmakers, embroiderers, carvers, painters, mirror-makers, inlayers, etc. were also involved. They were brought together by wealthy art dealers as those of the Forchondt and Musson families, who contracted them for the making of the cabinet. For example, on several occasions the Forchondt family hired Michiel Coignet, son of the mathematician and instrument-maker with the same name, to do the painting for some of their cabinets.⁶⁵ The dealers, sometimes in communication with the client if the piece was commissioned, not the makers of the cabinet or the free masters were responsible for the design of the cabinets.

The role of these merchant-entrepreneurs was to design the cabinet and to bring the different craftsmen together in an efficient network to realize the cabinet design, not to work on the cabinets with their own hands; the importance of the art dealer lay indeed elsewhere. As it became increasingly more difficult for customers to assess the quality of such a complex luxury good as the Antwerp cabinet, the role of the art dealer was comparable to that of the connoisseur in painting. On the one hand, the art dealer was important because of his knowledge of the taste of his clients. On the other, the reputation of the art dealer was increasingly important in determining the value of luxury goods. The value of an art cabinet was not just determined by the use of exotic timbers, ivory, silver, tortoiseshell, *façon de Venise* glass and other materials, but also by the name of the art dealer and his knowledge of networks of craftsmen, that is, his judgment on the quality of their work. As Bert de Munck has recently shown, the product's quality was not so much the outcome of the apprenticeship system; instead, the apprenticeship system was the representation and legitimization of that quality.⁶⁶ When cabinets became more luxurious and 'artistic' from the turn of the century, the importance of the apprenticeship for the transfer of skills and technical knowl-

edge waned. The symbolic properties of apprenticeship became more important: apprenticeships legitimized the producers of the art cabinet, and as such, they became a mark of the quality of the cabinet. While at the level of the producers the transfer of knowledge became less important, knowledge was central to the art dealers' and his clients' determination of the value of an art cabinet. In line with their role as merchant-*kenner*s they produced a specific type of art cabinet that, like pictures of collections, emphasized the value of knowledge.⁶⁷

This claim for the high value of knowledge largely depended on the art cabinet's 'perspective' (Figure 11). This perspective was a catoptrical construction in which three, four, five, six or seven plane mirrors were aligned as to form a small mirror cabinet.⁶⁸ This was the basic construction pattern, on which multiple variations, with several combinations of reflective and painted surfaces existed. The invention of the perspective, like that of the making of the *crystallo* mirrors from which it was made, might be due to Italian import in Antwerp. A certain Venetian, Baptista Redor, applied for a patent for a "very nice and new invention of a cabinet of mirrors, most excellent and very pleasant to see," but it is unclear whether this is directly connected to the perspectives in the art cabinets.⁶⁹ In any case, as already mentioned, the perspective differentiated the Antwerp art cabinets from those made elsewhere.

What did one see in these perspectives?⁷⁰ In some cases the mirror reflections revealed a painting (whether or not anamorphically produced) that remained otherwise invisible for the viewer; in other cases, the player of such an optical game was expected to introduce an object (for example, a coin or a statuette) in the perspective to enjoy the multiple reflections in the mirrors. The depth effects created by these multiple reflections were enhanced by columns and chequered floors with which the perspectives were sometimes decorated. It should be evident that these games were highly interactive – not unlike paper instruments in books, they involved the active participation of the user – and, therefore, the owner of such an art cabinet (or the visitors to his house or collection) had to have optical knowledge to play these games. One of the most likely sources of this type of knowledge is Giovanni Battista della Porta's *Magia naturalis*, of which the first edition was published in four books in 1558, and in which the catoptrical constructions and

⁶⁷ For this notion of merchant-*kenner*, see De Marchi and Van Miegroet, "Art, Value, and Market Practices," 451-64. On the role of art dealers more generally, see Montias, "Art Dealers," 244-56.

⁶⁸ Fabri, "Experiment en doctrina," 241-61; Fabri, "Perspectiefjes in het spel," 109-17.

⁶⁹ On 13 April 1575 Redor applies for a patent for "fort belle et nouvelle invention d' un cabinet de miroirs, fort excellent, triumpant et tres plaisant a veoir, demonstrent ung tresor de grant nombre de joyaux chose jamais usee nij veue." Cited in Fabri, *De 17de-eeuwse Antwerpse kunstkast*, 77.

⁷⁰ *Ibid.*, 72-85.

⁶³ De Munck, "Construction and Reproduction," 87-89.

⁶⁴ For collaborative practices in Antwerp painting, see Honig, *Painting and the Market*, 177-89. Honig connects elite collaboration to friendship in Honig, "Paradise Regained," 271-300.

⁶⁵ For Michiel II Coignet, see Meskens, *Familia Universalis*, 147-51.

⁶⁶ De Munck, "Construction and Reproduction."

effects used in the perspectives were discussed. It was translated into several languages, including Dutch, as published by Plantin in 1566.

In *Magia naturalis* della Porta discussed, for example, the so-called *theatrical mirror*, in which mirrors were aligned along the circumference of a circle, or also a combination of plane mirrors revealing a hidden statuette, both catoptrical systems at the basis of the design of the perspectives of the art cabinets.⁷¹ Della Porta specified that *crystallo* mirrors were necessary to obtain these optical effects, for example in his description of the so-called *polytaton*. The *polytaton* consisted of two *crystallo* mirrors, combined in such way “that like a book they can be opened and closed, and so that the angles can be varied, like one uses to make them in Venice.”⁷² Della Porta did not invent these mirror combinations to obtain the effects of multiple images changing sizes and places; he was explicit that he took the designs from Ptolemy. In fact, in these sections della Porta paraphrased the *Catoptrics*, now attributed to Hero of Alexandria, but first printed together with Sacrobosco’s *Sphere* in Venice in 1518, and then known as Ptolemy’s *De*

⁷¹ “The wise ancients found a way to make a mirror out of plane surfaces in which, if one holds one thing [in front of it], many equal images are seen, as one may notice in the writings of Ptolemy. This mirror was made in the following way: On a plane table or other location where you would like to place such a mirror, one shall make half a circle and divide this in equal parts by as many points as the number of images. Draw the cords and cut off the little strips. Then place perpendicularly on [the cords] plane mirrors of equal breadth and height next to each other [...] Therefore this mirror is called in Latin *Theatralis*” / “De wijze ouders hebben ghevonden de maniere om een spiegel te maken van effen superficien / voor dewelcke houdende een dinghen / veel ghelijcke dinghen ghesien werden / ghelijckmen uit den schriften van ptolomeus mercke mach: dewelcke aldus gemaect wert. Op een effen tafel oft andere plaetse daer ghy sulcke spiegel stellen wilt / salmen maken een halve cirkel en desen ghelijck deelen met punten na het getal vande figuren / trect daer onder de coorden ende snijt de reepkens af: daerna so recht daer op effen spiegels vande selfde breedde en hoochde gelijc tegen malcander gestelt / [...] Daerom wordt dese spiegel in latijn ghegheeten *Theatralis*.” Porta, *Magia*, 267-68.

⁷² “One also makes a mirror called *polytaton*, that is, to see many things, because by opening or closing with only one finger one sees more than twenty figures or images in it. You shall make this mirror in the following way: One shall place two crystal mirrors on a feet [...] so that like a book they can be opened and closed, and so that the angles can be varied, like one uses to make them in Venice” / “Men maect oock eenen spiegel *polytaton* ghenaeft / dat is te segghen / om veel dinghen te sien: want metten open doen oft sluyten van alleene een vingher / so sietmen daer in meer dan twintich figuren oft beelden. Desen spiegel sult ghy aldus maken. Men sal op een voet over eynde stellen twee stralen oft crystalline spiegels [...] so datse ghelijc eenen boec meugen open ende toeghedaen werden / ende dat de hoecken divers comen / gelijcmen te Venegen pleecht te maken.” Porta, *Magia*, 268-69.

speculis.⁷³ Thus, the Antwerp art cabinets, with their *perspectieffes* of mirror glass, embodied Hero’s catoptrical knowledge.

However, these art cabinets did not only transmit a body of optical knowledge. They also exported Hero’s rhetoric on the value of ‘mechanical’ knowledge. Hero’s descriptions of catoptrical systems underscored the epistemic superiority of the mathematician, who understood the underlying optical foundations, over the unknowing audience, who only experienced the optical effects.⁷⁴ The message that these art cabinets embodied was, in a similar vein, that their users (as they are knowledgeable of optics) will not be deceived, only the ignorant. The Antwerp art dealers who commissioned and exported art cabinets thus traded in Hero’s wonders creating an intellectual and social boundary between the effects and the mechanism that produced it and between those who understood the causes and those who were deceived. The perspective of the Antwerp art cabinet thus allowed collectors to share the knowledge on which their community was built, but also to exclude the ignorant from this community. Moreover, it should also be noted that the art cabinets show that wonder – but then not so much as a disinterested passion remote from the spheres of commerce – had its place in a mercantile culture of collecting characterizing the city of Antwerp. That Antwerp art dealers traded in Hero’s wonders shows that attempts to oppose the world of wonder to that of commerce in the Netherlands would be misguided.⁷⁵ Like the pictures of collections, the wonderful Antwerp art cabinets carried a message about the high value of knowledge.

Conclusion

While Antwerp was already an important centre of luxury industries in the sixteenth century, the newly invented luxury goods, in the manufacture and trade of which art dealers and craftsmen specialized after the blockade of the Scheldt in

⁷³ Sacrobosco, *Sphera*, 250v-52v: “Ptolemeus De Speculis.” For the history of the transmission of the manuscript, its publication history, and a recent edition of the text, see Jones, “Pseudo-Ptolemy *De Speculis*,” 145-186. For the Renaissance reception of Hero’s works, see Marr, “Understanding *automata*,” 209-14. Marie Boas discusses how della Porta’s catoptrical devices are copied from Hero in “Hero’s *Pneumatica*,” 38-48.

⁷⁴ Tybjerg, “Wonder-making,” 443-66.

⁷⁵ Cook opposes his views connecting commerce and Early Modern science to those which give pride of place to wonder, however, defined – following the work of Lorraine Daston – as a passion characterized by disinterestedness. See Cook, *Matters of Exchange*, 45. For the re-introduction of commerce in to the history of the marvellous and wondrous, see Alexander Marr’s introduction to Marr and Evans, *Curiosity and Wonder*, 1-20.

the early seventeenth century, carried a message about the material culture produced and consumed in the city. The manufacture of luxury goods, such as *façon de Venise* glass, depended upon the transfer of skills and technical knowledge to the city of Antwerp, mostly by immigration. The consumers of these luxury goods did not necessarily appropriate the bodies of knowledge on which the production of the luxury goods was based. However, as I have argued in this essay, in early seventeenth-century Antwerp a culture of collecting thrived in which merchant-collectors not only consumed objects as commodities to display wealth, but also as objects of knowledge. The Portuguese merchant-banker Ximenez is presumably unique in developing, together with his Florentine friend Neri, an interest in the manufacture of luxury glass, but other Antwerp collectors (and Ximenez) developed similar interests in the bodies of knowledge on which the making and use of other objects in their collections were based. This culture of collecting supported the building of a community based on shared knowledge. Material objects did not only belong to networks of trade; they were also vehicles of the circulation of friendship, and they were so, because collectors in Antwerp recognized them as objects of knowledge.

The newly invented luxury goods – the pictures of collections and the art cabinets – allowed Antwerp craftsmen, artists and art dealers to export the message that the material objects in which they traded were objects of knowledge, however not to all without discrimination or distinction, but only to those friends who desired membership of their community. They re-packaged a luxury good such as *façon de Venise* glass to produce a new type of luxury good which carried a message about the high value of knowledge. But which type of knowledge did they value? Was it the kind of knowledge acquired through acquaintance with objects (*naturalia* and *materia medica*) found in collections in the Dutch Republic? Surely, the knowledge about which the pictures of collections valued included connoisseurship – that of paintings and other man-made art objects though – as Elizabeth Honig has argued. Nevertheless, the knowledge on which the perspectives in Antwerp art cabinets were based was mathematical, and those cabinets (as well as some pictures of collections – those most prominently displaying mathematical objects) underscored the high value of mathematical knowledge. However, even mathematical knowledge, according to the message carried by these luxury goods, was preferably acquired through bodily engagement with material objects (mathematical instruments) – though not exclusively: the libraries of early seventeenth-century collectors in Antwerp and della Porta's *Magia* on the perspectives show that the acquisition of mathematical knowledge was assisted by the reading of texts.

While the differences between the culture of collecting in the Dutch Republic and the Spanish Netherlands should not be exaggerated – indeed, as I have argued, some of these differences do not reflect the available but still incompletely explored evidence of the inventories of collections – there are good reasons to add to the growing scepticism about the continuities between the south and the north in the spheres of economy, technology and science, briefly reviewed in the introduction to this essay, some supplementary caution as regards north-south continuities between the cultures of collecting. That the VOC conquered the world seas, bringing Asian and New World objects to collections in the Dutch Republic, while Antwerp, after the blockade of the Scheldt, specialized in luxury industries did make a difference, but perhaps less to the objects that were collected than to the reflection on Antwerp's material culture and how it connected to issues of knowledge. The emphasis on luxury goods, mathematical objects and wonder made Antwerp's knowledge economy significantly different from the portrayal of that in the seventeenth-century Dutch Republic in accounts connecting science and commerce in the United Provinces. The newly invented luxury goods that Antwerp produced – pictures of collections and art cabinets – not only placed high value on knowledge nor did they solely emphasize the role of objects in knowledge acquisition and consumption. They also commented on the limits of objects to function as carriers of knowledge. While in practice the acquisition of mathematical knowledge was assisted by the reading of texts, those luxury goods which embodied the high value of knowledge highlighted that only knowledgeable *friends* were able to recognize material objects as objects of knowledge. *

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