Visions

On the occasion of the 100th Preprint in the Max Planck Institute for the History of Science series we offer three brief, speculative reflections on the splendid allegorical painting "Vision" by Jan Breughel the Elder and Pieter Paul Rubens. These are essays in the root sense of the word: tentative, exploratory attempts to survey the depth and breadth of a subject, rather than detailed monographs or sharply formulated arguments. We write as historians of science, not as historians of art, and although our interests in botany, scientific instruments, and natural history collections in early modern Europe inform these essays, our aim was not simply to analyze this or that detail of the painting from these specialist standpoints. We also wanted to experiment with a form of thinking and writing that was deliberatively associative, deliberately disresepectful of disciplinary boundaries, and deliberately open-ended. We hope that these essays capture something of the experimental, open-minded spirit of our young Institute.

About the painting: "Vision" (65 X 109 cm, 1617) is one of a series of five allegorical paintings on "The Five Senses" executed by Jan Brueghel the Elder and Pieter Paul Rubens. All five paintings are now part of the permanent collection of the Museo del Prado, Madrid ("Vision": cat.nr. 1.394). Further information in: Matías Díaz Padrón, *El Siglo de Rubens en el Museo del Prado. Catálogo Razonado de Pintura Flamenca del Siglo XVII* (Madrid: Museo del Prado, 1995).

A Thousand Flowers
Hans-Jörg Rheinberger.. *3*

Visions: The Disorder of Things and the Unity of Art and Nature
Lorraine Daston *17*

Rettung aus Sehnot
Jürgen Renn.. *25*

A Thousand Flowers

Hans-Jörg Rheinberger

The Allegory of Vision is part of the Prado cycle on the five senses jointly painted by Jan Brueghel the Elder and Peter Paul Rubens. Art historian Justus Müller Hofstede postulates that the cycle owes its basic allegorical structure and emblematic design to Rubens.[1] It is nonetheless thanks to Brueghel's subversion of that structure and design from which the painting appears to me to derive its enigmatic, even magical character. In any case, Müller Hofstede could, in 1984, still claim that despite considerable attention,[2] "the painting has neither been exhaustively analyzed nor satisfactorily interpreted up to this day."[3] Continued efforts notwithstanding,[4] I have a few new additional observations to offer. Yet the following remarks are deliberately pointillistic, and do not even remotely aim at a systematic and exhaustive analysis or a satisfactory interpretation of Brueghel and Rubens's painting.

Duplication, Mirroring, and Identity - Individualization, Contrast, and Difference

One of the paradoxes of the painting is the following: One the one hand, there is no nature in this highly stylized princely cabinet full of naturalia and artificialia of all sorts; no natural 'order' or functional connection is to be detected among them. On the other hand, there is "al wat ter werelt is" painted "naert leven":

> "Wat belanct de Vyf sinnen, hebbe die met lust onder handen om alles naert leven te doen,
> als ooc het subject playsant is om al wat ter werelt is daer in te connen maken."[5]

1 Justus Müller Hofstede, 'Non Saturatur Oculus Visu' - Zur "Allegorie des Gesichts" von Peter Paul Rubens und Jan Brueghel d.Ä., in H. Vekeman und J. Müller Hofstede, Wort und Bild in der niederländischen Kunst und Literatur des 16. und 17. Jahrhunderts. Erfstadt 1984, pp. 243-288.

2 See, e.g., Matías Díaz Padrón, Pedro Pablo Rubens. Madrid 1977-1978; Klaus Ertz, Jan Brueghel der Ältere (1568-1625). Die Gemälde mit kritischem Oeuvrekatalog. DuMont, Köln 1979, pp.328-362.

3 Müller Hofstede 1984, p. 243.

4 See Matías Díaz Padrón y Mercedes Royo-Villanova, David Teniers, Jan Brueghel y los gabinetes de pinturas. Madrid, Museo del Prado 1992, pp. 112-125, and bibliography therein.

Usually, but wrongly, this sentence is attributed to Brueghel de Velours.[6] It is actually from his son Jan II who continued to produce allegories of the five senses for an international, even overseas clientele and which, as he reports, a thousand people came to see in his atelier.[7] But the father's work is perfectly captured in the utterance, potentially everything being worthy of attention and depiction. On the occasion of a flower painting for his friend and customer Cardinal Federico Borromeo in Milan a decade earlier -- "una Massa de vario fiori" as he called it in his broken Italian --, the elder Jan Brueghel had even traveled to the gardens of the Archduke Albrecht VII in Brussels, "per ritrare alcuni fiori del natural, che non si troue in Anuersa."[8] The Archduke had a predilection for rare flowers.[9] Two years later, Brueghel wrote to Borromeo's agent Ercole Bianchi about "un quadret de fiori, qualo io retroue con discomede alli giardini: simili fiori son trop in e‘ stimi per auer in casa."[10] And on another occasion, he explained to Bianchi: "Gli fiori besoigni fare alle prima, sensa desseigni o boitssaturo: tutti fiori uengeno in quatra mesi, et sense inuencioni besoigni giungere in seime con gran discretcion."[11] From an analysis of Brueghel's letters to Cardinal Borromeo and of the flower pieces themselves, B. Brenninkmeyer-De Rooij convincingly argues that Brueghel must have painted at least some of his rare flowers directly into the bouquet, in the order in which they blossomed during a four month season. This may also explain the fact that the different flowers, perfectly recognizable in their form, are not drawn to size with respect to each other. Brueghel may even have painted to some extent in the open air of the garden, which was quite exceptional at that time.[12] Brueghel's flower bouquets exhibit the same encyclopedic spirit as do the courtly gardens, those "open air equivalents to the Kunst- and Wunderkammer."[13] And they exhibit the same encyclopedic amassment as does our cabinet painting: they are collections, "Massas", that do not have an identifiable overall cohesion in terms of, e.g., season or habitat, let alone system. They follow the criteria of rarity, particular beauty, and relational aesthetic fit.

All things in this cabinet painting are rendered as individualized items: flowers, animals, instru-

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5 Jan Brueghel the Younger to the art dealer Chrisostomo van Immerseel in Sevilla, September 2, 1631. J. Denucé, Briefe und Dokumente in Bezug auf Jan Breugel I und II. Quellen zur Geschichte der flämischen Kunst. De Sikkel, Antwerpen 1934, p. 71.

6 See, e.g., Christian Klemm, Weltdeutung - Allegorien und Symbole in Stilleben. In Gerhard Langemeyer und Hans-Albert Peters, Stilleben in Europa. Aschendorff, Münster 1979, pp. 140-218, on p. 169; Ute Kleinmann in Pieter Breughel der Jüngere - Jan Brueghel der Ältere. Flämische Malerei um 1600. Tradition und Fortschritt. Kulturstiftung Ruhr Essen, Luca Verlag, Lingen 1997, p. 314.

7 Denucé 1934, documents 32, 33, 39, 41, 42, 45, and 83, especially p. 83.

8 Giovanni Crivelli, Giovanni Brueghel, pittor fiammingo o sue lettere e quadretti esistenti presso l'Ambrosiana. Milano 1868, p. 63.

9 Ertz 1979, p. 254 sq.

10 Crivelli 1868, p. 110.

11 Crivelli 1868, p. 168.

12 B. Renninkmeyer-De Rooij, Zeldzame bloemen, 'Fatta tutti del natturel' door Jan Brueghel I. Oud Holland 104 (1990), 218-248.

13 Norbert Schneider, Vom Klostergarten zur Tulpenmanie. Hinweise zur materiellen Vorgeschichte des Blumenstillebens. In Gerhard Langemeyer und Hans-Albert Peters (eds.), Stilleben in Europa. Aschendorf, Münster 1979, pp. 294-313, p. 302.

ments, sculptures, busts, pictures. Therefore, the identification of the pictures in the picture, for instance, poses no insurmountable problem. Peter Paul Rubens and Jan Brueghel himself are present, of course, alone and with coproductions. Tizian, Mancini, Raffael, Snyders, van Balen, and Pieter Brueghel the Elder are likely to be identified as further painters in the gallery.[14] The dominance of Flanders and Italy is overwhelming. Both Brueghel and Rubens had spent a few years in Italy as young painters. The pictures in the picture present the different genres that the painters of the Antwerp St. Lucas guild had to offer at the beginning of the seventeenth century: biblical history, saints, and mythology on the counter-reformational side; historical painting, portraits, marine painting, landscape, hunting, still life on the secular. They too present the different types of usage of the art of painting: altar pieces and devotional pictures on the one hand; chimney pieces, supraportas, and cabinet paintings of different sizes on the other. Many of them, such as Rubens's Bacchanal, can be retraced to the collection of the Archduke.

In a marvelously variegated and multiple way, this Allegory of Vision is about duplication, mirroring, and identity; individualization, contrast, and difference. Vision is not exposed in the translucent immediacy of presenting a reality to the eye; it is on the contrary registered in an explosive multidimensionality of re-presentations, in which nonetheless everything is and remains "naert leven." This picture is about the endless game of representation. No detail is exempt from the game. Consider the Madonna in a Flower Garland that has long been taken for a replica of the garland painting which is part of the Louvre collection. Minutiae in the construction of the garland tell that it is not. For instance, a parrot-like bird is present and part of the upper left of the Louvre Garland. Instead, in our Allegory, a parrot colored in red and blue sits on the top left of the picture -- but to the right of the painting --, thus enforcing its material presence as a piece of art, an image, and emblematically, as an imitation for which the parrot stands. Ironically, the parrot also mirrors, in the color of his feathers, the color of Maria's clothes. It is assumed today that it is the copy of a Madonna that has been lost and that was painted for Albrecht VII of Austria, the Governor General of the Southern Netherlands.[15] As the portrait to the left of the painting, the two-headed Austrian eagle of the lustre, and other details indicate, the Allegory is dedicated to Albrecht VII and his wife Isabella Clara Eugenia.[16]

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14 Díaz Padrón and Royo-Villanova 1992, pp. 112-125.

15 Ute Kleinmann, Blumen, Kränze und Girlanden: Zur Entstehung und Gestaltung eines Antwerpener Bildtypus. In Pieter Breughel der Jüngere - Jan Brueghel der Ältere. Flämische Malerei um 1600. Tradition und Fortschritt. Kulturstiftung Ruhr Essen, Luca Verlag, Lingen 1997, pp. 54-66.

16 Ertz 1979.

Now, where do we stand with respect to representation, duplication, and mirroring? The Allegory of Vision is a co-production of Rubens and Brueghel. The most prominent picture in the picture is doubtlessly the Madonna in a Flower Garland to the right.[17] In this case, Brueghel obviously broke the chain of mirrors and painted Rubens's madonna himself. The weight of the piece is enforced by the 'visionary' triangle constituted by the telescope pointing to the oculum in the upper right of the gallery, from where rays of light enter the cabinet and cut the upper left edge of the madonna portrait. As a game with light, it is an element of the intricate network of the Allegory. The garland madonna itself is a depiction of another co-production of Rubens and Brueghel, first duplication. The madonna, in turn, itself consists of a picture in a picture: another duplication. The painting of the madonna with the child in the center oval medaillon has a dark border around it, from which the flower wreath seems to be detached, even to step out from the surface. The garland thus introduces yet another layer of duplicity and thereby enforces the presence of the madonna as an image. This tends to make the garland into something like a 'living' entourage of a painted figure. This impression is stressed by the individual character of the different flowers which are easily recognizable in kind and species. They are not at all idealized flowers, although they are part of a deliberately artificial arrangement. Its composition principle is a succession of amassed large flowers interspersed with and surrounded by small florescences. In order to undo this effect of realism, a bird is sitting on the outer frame and thus gives back to the construction as a whole its identity as a picture. Tellingly, the bird, surrounded by the interior of the constkamer, has its head oriented into the direction of the arc that opens to the gardens of the Archduke's Palace in Brussels in the upper left,[18] where the motif of the bird is taken up by a couple of peacocks near a fountain. But as if mirroring had no end in both directions, to the outside as well as to the inside, the garland of the outer part of the picture is repeated as a flower corona in the inner picture - another crown-like garland which an angel deposits on Maria's head.

The Allegory of Vision is a self-representation of the art of painting in which, in contrast to the famous -- and somewhat later -- Velázquez (Las Meninas) and Vermeer (De Schilderkunst) renderings among so many others, especially the gallery pictures of David Teniers de Jonge, the painter is not integrated as a figure into the picture. The painters are instead present with prominent works of their ateliers. At the place where we would expect the painter standing or sitting before his easel, we find, in the center of the foreground -- an ape. Just like the parrot, the ape too can be taken as an emblem of imitation in the deceptive mode of this activity. This motif is doubled, mirrored, represented in the representation, an emblem in the emblem, by the ape wearing eyeglasses. Eyeglasses, in the emblematic tradition, stand for deception and not, as we

17 For the origins of this genre, see David Freedberg, The origins and rise of the Flemish Madonnas in Flower Garlands. Münchener Jahrbuch der Bildenden Kunst 32 (1981), 115-150.

18 Padrón 1977-78, p. 122.

today might be inclined to assume, for clear and distinct vision.[19] And the ape is glaring, in the midst of the interior of a royal Wunderkammer, at a picture that displays and discloses, in the innermost of the ensemble, the endless bright horizon of the sea, itself an allegory of vision par excellence, with its ships that bring -- guided by a lighthouse, an 'eye' of the sea -- so many of these beautiful things to Antwerp that are rendered in the painting. This is all a game with identity and difference, as Foucault has described it for the classic age and distinguished it from the epistemic mode of the Renaissance game of similarities.[20] In order to topple the scene, not only does the ape wear a pair of glasses, he holds another pair in his left hand and thus perfects the display of a simulation of simulation. He sees nothing through the glasses he is wearing. That is, after all, the essence of being an ape in common perception and reception: surprisingly similar to a human -- his image, so to speak -- and yet, it's all simulated. As we have seen, the beautifully colored parrot on the top left of the flower garland madonna is involved in a similar game of deconstruction.

Equally center stage and in the front of the picture, immediately to the right of the ape, the picture-in-the-picture motif itself is taken apart. On a chair, two black-framed paintings are displayed, one slightly overlapping the other. The upper, bigger one pointing to the foreground contains a flower drawing painted in the manner of a coloured botanical illustration such as the ones that left the Antwerp ateliers of the Plantin-Moretus Press around 1600. The lower one, vague and blurred, almost receding into invisibility, is another madonna with child. Here we have the two elements of the garland painting separated, and the painter leaves no doubt as to which one of them he judges to be the more important one. We might even be inclined to assume that the eyes of the little dog beneath the chair in a sense take up the difference: its left eye, that under the madonna, appears to be smaller than the right one under the flower. Here we have another aspect of the allegory: sharp, botanically motivated observation supersedes indefinite, religious vision.[21]

Flowers and Gardens

This little botanical painting in the gallery makes us aware of the fact that there is a scientific background to the Fluwelen Brueghel's flower painting. Brenninkmeyer-De Rooij has argued that the white lilies which show up in the right upper quarter of the flower garland of the Louvre Madonna - and in our flower garland as well - are not the traditional 'madonna lilies' but repre-

19 Arthur Henkel und Albrecht Schöne (eds.), Emblemata. Handbuch zur Sinnbildkunst des XVI. und XVII. Jahhunderts. J. B. Metzler, 1967/1996, pp. 1424-1425.
20 Michel Foucault, Les mots et les choses. Gallimard, Paris 1966.
21 This interpretation stands in direct opposition to the religious and philosophical overtones that Ertz sees at work in the Allegory. Ertz 1979, pp. 343-348.

sent Lilium hemerocallis, which Brueghel may have painted after Rembert Dodoens's Stirpium historiae pemptades sex, first printed with Plantin in Antwerp 1583.[22]

Botany had achieved prominence in the Southern Netherlands during the sixteenth century. Herbal tradition gradually was left behind, the first taxonomies were undertaken, and the first regional 'floras' made their appearance. Under the influence of new exotic plants brought from the Indies and the Americas, botanists started to realize not only that they had barely begun to recognize the full scope of vegetal forms all over the world, but that there were regional characteristics of floral composition in Europe as well. Rembertus Dodoens from Malines (1517-1585), Carolus Clusius from Atrecht (1526-1609), and Mathias Lobelius from Lille (1538-1616) all contributed to the expansion of botanical knowledge throughout the century in Flanders. If it is safe to assume that about 1000 plants were known to the European botanists at the beginning of the sixteenth century, by the end of the century the number had risen to about 6000. In addition to his floristic studies in many parts of Europe, Clusius, who had been at the Court of the Habsburgs in Vienna under Maximilian II and Rudolph II between 1573 and 1588, ended up laying out the botanical garden in Leiden in 1593.[23] He especially also contributed to the knowledge of exotic plants by drawing on the herbals of the Spaniard Nicolás Monardes as well as of the Portuguese Garcia ab Orto and Christophorus a Costa. The majority of their works were printed in the Officina Plantiniana in Antwerp. Christopher Plantin, who was active as a publisher and printer from 1555 to 1589,[24] produced no less than twenty botanical works in this period. Among them are six by Dodoens, three by Clusius, three by Lobelius, one by a Costa, three by Monardes, and another three by ab Orto.[25] After Plantin's death, the related Moretus and Raphelengius families took over and continued to produce new botanical books and reissues of old ones over the next half century in Antwerp as well as in Leiden.

But the scientific concern is only one element in the rise of the artistic interest in flowers. The others are foreign floristic trade and domestic horticulture, the two cornerstones of a growing botanical commerce and hallmarks of Flanders at that time. In his Plantarum seu stirpium historia, one of Plantin's editions from 1576, Lobelius writes:

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22 Brenninkmeyer-De Rooij 1990, p. 234.

23 It had been officially founded in 1590. Leslie Tjon Sie Fat, Clusius' garden: A reconstruction. In: Leslie Tjon Sie Fat and Erik de Jong (eds.), The Authentic Garden. Clusius Foundation, Leiden 1991, pp. 3-12. Clusius was aided by the pharmacist Dirck Outgaertsz. Cluyt (ca. 1540-1598). J. Kuijlen, C. S. Oldenburger-Ebbers, and D. O. Wijnands, Paradisus Batavus. Bibliografie van plantencatalogi van onderwijstuinen, particuliere tuinen en kwekerscollecties in the Noordelijke en Zuidelijke Nederlanden (1550-1839). Pudoc, Wageningen 1983, p. 10.

24 Elly Cockx-Indestege en Francine de Nave (red.), Christoffel Plantijn en de exacte westenschappen in zijn tijd. Gemeentekrediet, Brussel 1989.

25 L. Voet, Christopher Plantin as a promoter of the science of botany. In: F. de Nave and D. Imhof (eds.), Botany in the Low Countries (end of the 15th century - ca. 1650). The Plantin-Moretus Museum and the Stedelijk Prentenkabinet Publication No. 27. Snoeck-Ducaju & Zoon, Antwerp 1993, pp. 39-45.

> "This entire, considerable and prominent region of Belgium (long ago known to the world as Flanders or Low Germany) is indeed the most famous warehouse in the whole of Europe. The most extraordinary and desirable of goods from across the globe are imported here in abundance over land and sea, and all the treasures of Europe, Asia and Africa are brought together here. The land is rich in brilliant talents, excellent in every art and science. Although the Northern climate is less suited to cultivating many plants because of its harsh cold, long winters, persistent lashing storms and other (additional) ravages, the zest for work, the precision and persistent care with which the inhabitants preserve the fragile plants from these conditions is nevertheless so great, that nowhere in the world can a plant be found which is not grown here under new techniques, and outstandingly cultivated by the unremitting labour and unflagging toil of an outstanding and distinguished people who spare no expense to this end. For this very reason, and not mistakenly, I would offer the first prize for developments in botany, the most important science befitting the greatest scholars, to the Belgians. For in this area alone one encounters more species and varieties of plants, shurbs and trees than can be found in ancient Greece, wide Spain, Germany, England, France and refined Italy, or any other neighbouring country or region."[26]

Lobelius then goes on and mentions a few major gardens: that of the prince of Chimay, Karel van Bossu, viscount of Brussels; Gilbert d'Oignies, bishop of Tournai; and Cornelius Gemma and Jan Viringius, professors of the University of Louvain. To these we may add the gardens of Charles de Saint-Omer, Heer van Drenouter, Moerkerk and Moerbeek, of Gérard van Veltwijck from Brussels, of Jean de Brancion,[27] and the famous garden of the pharmacist Pieter van Coudenberghe (ca. 1520-ca. 1594) from Antwerp, who created one of the oldest private gardens in 1548 where he cultivated up to 600 species, many of them exotic.[28] During the winter, he kept his exotic plants in special shelters. They soon developed into what became known as orangeries.[29] Nobody, if wealthy enough, appears to have been excluded from the pleasures of gardening in sixteenth-century Flanders. Private gardens belonged not solely to aristocrats, but also to clergymen, university professors, pharmacists, and other wealthy citizens. If we add the botanical gardens of universities such as Leiden, we are not surprised to learn that the demand of amateur collectors and professionals greatly contributed to a flourishing trade of commercial gardeners. They especially expanded their business from the end of the sixteenth century throughout the seventeenth century and produced an unprecedented wealth of new varieties and hybrids of garden plants. The oldest known book entirely devoted to garden models, Johannes Vredeman de Vries's Hortorum viridariorumque elegantes, dates from 1583 and was, of course, also printed in Antwerp.[30] Thus we get a glimpse of the cultural entourage in which

26 Mathias Lobelius, Plantarum seu stirpium historia. C. Plantin, Antwerp 1576, preface. Quoted in: F. de Nave, From auxiliary science to independent discipline: Botany in the Southern Netherlands during the 16th century. In: Botany in the Low Countries (end of the 15th century - ca. 1650). The Plantin-Moretus Museum and the Stedelijk Prentenkabinet Publication No. 27. Snoeck-Ducaju & Zoon, Antwerp 1993, pp. 11-18.

27 Kuijlen, Oldenburger-Ebbers, and Wijnands 1983, p. 31.

28 A catalogue of Coudenberghe's garden was first printed in Conrad Gesner, De Hortis Germaniae, Strassburg 1561. See also L. J. Vandewiele, The garden of Pieter van Coudenberghe. In F. de Neve and D. Imhof 1993, pp. 23-31.

29 Erwin B. W. van den Muijzenberg, A History of Greenhouses. Institute for Agricultural Engineering, Wageningen 1980.

30 The complete title is: Hortorum viridariorumque elegantes & multiplicis formae, ad architectonicae artis normam affabre delineatae.

flower painting reached a new climax and early mastership with Jan Brueghel the Elder in Antwerp at the beginning of the seventeenth century. The development of a culture of ornamental garden plants toward the end of the sixteenth century was a main incentive for the flower still-life.

Until 1550, roses, lilies, irises, peonies, columbine, stocks, and carnations dominated the gardens of Flanders and Holland as well as those of other European countries. They were a heritage of medieval gardening, with a few of them even going back to Roman times. A few others, such as Dianthus caryophyllus, had made their way from Arabic gardens through Spain and France to Northern Europe.[31] From a close inspection of contemporary herbals and flower books, Sam Segal has concluded that between 1500 and 1550, about ten new species appear to have been introduced to the region of Flanders, whereas between 1550 and 1600, the number explosively grew to more than hundred, and between 1600 and 1615, another 120 were added.[32] It is interesting to note that in Italy the numbers are about the same during the sixteenth century: about fifteen exotic species introduced before 1550, and more than a hundred from 1550 to 1600. But in contrast to Flanders and Holland, only eleven new species were added between 1600 and 1615.[33] This period of European, predominantly North European gardening was "probably the most exciting of the whole history of gardenig."[34] It also saw a tremendous spread of books with flower engravings intended for amateur and commercial rather than for scientific use. Among them we find Pierre Vallet's Le Jardin du Roy Tres Chrestien Henry IV (1608), Emanuel Sweerts's Florilegium (1612), Johan Theodor de Brij's Florilegium Novum (1612-1614), pharmacist Basilius Besler's Hortus Eystettensis with the plants from the garden of the prince bishop of Eichstädt, Johann Conrad Baron of Gemmingen (1613), and Crispijn de Passe's Hortus Floridus (1614).[35] They responded to the growing needs of wealthy citizens who established private gardens even in the back of their town houses, for example between the Keizersgracht and the Herengracht in Amsterdam.[36] Emanuel Sweerts is very explicit in this respect. On the front page, he announces:

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31 André Lawalrée, Peinture et botanique. In: Tableaux de fleurs du XVIIe siècle. Peinture et botanique. Musées Royaux des Beaux-Arts de Belgique 1989, pp. 25-30; W. T. Stearn, Les fleurs et l'art, une affinité élective. In: Sabine van Sprang (dir.), L'empire de flore. Histoire et représentation des fleurs en Europe du XVIe au XIXe siècle. La Renaissance du Livre, Bruxelles 1996, pp. 15-25.

32 Sam Segal, Flowers and Nature. Netherlandish Flower Painting of Four Centuries, Amstelveen 1990, Introduction, p. 42.

33 P. A. Saccardo, Cronologia della flora Italiana, ossia repertorio sistematico delle piú antiche date ed autori del rinvenimento delle piante (Fanerogame e Pteridofite) indigene, naturalizzate e avventizie d'Italia e della introduzione di quelle esotiche piú comunemente coltivate fra noi. Tipografia del Seminario, Padova 1909.

34 Stearn 1996, p. 19.

35 Kuijlen, Oldenburger-Ebbers, and Wijnands 1983.

36 C. Swan, Les fleurs comme curiosa. In: Sabine van Sprang (dir.), L'empire de flore. Histoire et représentation des fleurs en Europe du XVIe au XIXe siècle. La Renaissance du Livre, Bruxelles 1996, pp. 86-100.

> "So iemand waer die lust heeft van dese boecken ofte bloemen die daerinne begrepen staan te coopen dye kome inder Messtyt vor het Raethauys opten Roemer inden laden van desen auteur Manuel Sweerts: Na de Messe tot Amsterdam by Paulus Aertssen van Ravesteyn Boeckdrucker sall een jeder goet bescheyt doen."[37]

New imports declined after this surge for the rest of the seventeenth century. Instead, however, selecting new varieties and breeding new hybrids became a dominant preoccupation of the gardeners. A new wave of imports, this time from South Africa, followed later between 1690 and 1760.[38]

With a few exceptions, such as Tagetes patula and Tagetes minuta, the garden flowers -- in contrast to vegetables such as maize, bean, potato, tomato, and tobacco -- did not yet come from the Middle and South Americas. Most of the newly imported garden flowers in the second half of the sixteenth century came from Eastern and Southern Europe and from Asia Minor, notably from Turkey, where the garden culture was more developed at that time than in Europe.[39] The Turks had conquered Constantinople in 1453 and besieged Vienna in 1529 without success. Thereafter, diplomatic relations between the Habsburg empire and Turkey became important. Among the new imports, to quote only those which can be found in the bouquets and garlands of the Fluwelen Brueghel, were Adonis vernalis, Anemone coronaria, Antirrhinum majus, several campanulas, Fritillaria imperialis, Fritillaria meleagris, Hyacinthus orientalis, Jasminum officinale, Lychnis chalcedonica, Muscari botryoides, Ranunculus asiaticus, Syringa vulgaris, and most importantly, Tulipa spec.[40] The Belgian Ogier Ghiselin de Busbecq (1522-1591), ambassador of the Habsburg emperor Ferdinand I to Sultan Suleyman II in Istanbul between 1554 and 1562, is said to have played a decisive role in bringing the tulip to Western Europe. As far as we know, it grew in the garden of Heinrich Hewart in Augsburg in 1559, where it was described and depicted for the first time in 1561 by Conrad Gesner. In Brussels and in Antwerp, it made its appearance between 1560 and 1562, and it soon spread around Flanders and North Holland. In Flanders, Dodoens described it for the first time in 1568, and in 1581, Lobelius, in his Kruydtboeck, listed no less than 47 types. The Florilegium of Emanuel Sweerts, published in 1612, offered already around hundred varieties of the new garden star. Around 1635, at the outset of the famous Tulipomania,[41] the first tulip books exclusively devoted to this flower appeared, and in the middle of the Golden century, around 1000 names of varieties were circulat-

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37 Emanuel Sweerts, Florilegium, Vol. I. Frankfort aan de Main 1612.
38 Segal 1990, p. 42.
39 D. Onno Wijnands, Commercium botanicum: The diffusion of plants in the 16th century; and Nevzat Ilhan, The culture of gardens and flowers in the Ottoman empire. In: Leslie Tjon Sie Fat and Erik de Jong (eds.), The Authentic Garden. Clusius Foundation, Leiden 1991, pp. pp. 75-84 and 131-138.
40 Tableaux de fleurs du XVIIe siècle. Peinture et botanique. Musées Royaux des Beaux-Arts de Belgique 1989.
41 N. W. Posthumus, The tulip mania in Holland in the years 1636 and 1637. Journal of Economic and Business History 1 (1929), 434-466; E. H. Krelage, Bloemenspeculatie in Nederland - De Tulpomanie van 1636-'37 en de Hyacintenhandel 1720-'36. P. N. van Kampen & Zoon N. V., Amsterdam 1942; E. H. Krelage, De pamfletten van den tulpenwindhandel 1636-1637. M. Nijhoff, 's-Gravenhage 1942.

ing.[42] They might have corresponded to about 500 different varieties.[43]

42 Sam Segal, The Tulp in de Gouden Eeuw. In Michiel Roding and Sam Segal, De Tulp en de kunst. Verhaal van een symbool. Waanders, Zwolle, pp. 74-113.
43 Kuijlen, Oldenburger-Ebbers, and Wijnands 1983, p. 52.

All of the above mentioned flowers or garden varieties thereof figure prominently in Brueghel de Velours's flower paintings, especially in his bouquets. Our floral wreath and the little bouquet of cut flowers on the gallery painting are somewhat less exuberant in this respect. Besides roses, anemonae, snowdrops, syringe, and a variety of narcissi, about half a dozen of varieties of tulips can be identified in a blue porcelain vase. The latter reappears in a central position on the corresponding Allegory of Smell of the Prado cycle. In contrast to the thick flower package of the garland to the lower right, the cut flowers to the upper left of the painting form a rather loose assortment. And whereas in the thick package of the wreath the flower heads are the most important elements of composition, in the vase, each flower stands on its own and is shown in its characteristic habitus. Quite unusually, the roses include even a bud, and one of the anemonae is withering. The individual flowers are drawn in approximately correct proportions, and they are mostly spring flowers. From the position of the little flower vase on a chest of drawers, it is only one more step, so it seems, to the flowers growing in the garden on which the cabinet opens - the diagonal clearly pointing from inside to outside. What a contrast to Jan I Brueghel's overstuffed early bouquets such as the Large Flower Bouquet from Vienna![44] And what a contrast to the tight package of the garland! Although all its flowers are identifiable in principle,[45] the garland forms an impossible ensemble. As in Brueghel's large bouquets, the flowers in the wreath are not drawn to their respective size, they span the seasons, and they are a mixture of wild and garden plants. But this is not the whole play of identity and difference in the flower part of the picture. For behind the flower bouquet, to the uppermost left, we encounter a wall tapestry that responds to the madonna in a very intricate way. First, it too contains a flower garland around it. In contrast to the madonna picture, however, the tapestry flowers appear stereotyped and perform the proper function of a frame. Thus they display nothing of the prominence of the garland to the right, which almost seems to protrude from the plane, and from which single flowers such as the Fritillaria meleagris to the left and right even lapse into the madonna painting. In the upper left, this function is taken over by the vase with the cut flowers, which partially overlaps the frame of the carpet, and which partially even protrudes into the open air and the twigs of a tree behind the cabinet. The tapestry, as a counterweight to the religious motif of Maria and Child, essentially displays a landscape. But like the wreathed madonna, the landscape of the tapestry presents itself again as a kind of picture in a picture. For the trees and branches that form a garland-like foreground surrounded by the flower frame open the view onto the landscape in the middle ground, which again opens itself to a mountainous horizon.

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44 Museum of Art History Vienna, Gallery of Paintings, Inv. Nr. 570.

45 So far, I have been able to identify Allium sp., Anemone coronaria, Anemone hepatica, Anemone hortensis, Aquilegia vulgaris, Borago officinalis, Convallaria majalis (fruits), Dianthus caryophyllus, Fritillaria meleagris, Gentiana, Hyacinthus orientalis, Iris sp., Jasminum officinale, Leucojum vernum, Lilium bulbiferum, Lychnis chalcedonica, Narcissus sp., Nigella damascena , Primula sp., Ranunculus sp., Rosa sp. (also buds), Scilla sp., Syringa vulgaris, Tulipa sp., Viburnum opulus, Vinca, Viola tricolor.

Representation

This picture is a game with representation. The constkamer which is depicted is, to begin with, in itself a prime instance of representation. The constkamer, in turn, is represented as a gallery picture. In this gallery, there is a picture that is again a representation of a representation, and so on. Differences and identities all over again. References, not similarities, referential displacements into the depth of the space as well as across its surface. Although there is clearly an allegorical impact, indeed, the whole picture is part of an allegorical cycle, there is no prescription here, no heavy load of moral tales to tell about seduction and other vices of the visual sense. But there is no narration either. In a sense, this picture has no plot, although it is able to tell innumerable different stories. Whereever we start, we are led onto another itinerary. If there is an epistemological message to this composition, it is this: There is endless raffinesse in description, "alles naert leven," and potentially everything, "al wat ter werelt is," is worth being described. Like the contemporary Sinnepoppen,[46] it gives rise to potentially endless connections, to numerous stories, all of them being worth of being pursued in their own right, be they religious as in the case of the madonna, or pagan as in the case of the Rubens' Bacchanal leaning to its lower left edge, a contrast which is taken up by the pagan Venus who is contemplating Christ healing a blind man presented to her by Amor. The painting lives from these contrasts, but there is no totalizing center, no overall prescription, no dominating narrative. There is a potentially endless unfolding of vision instead, without a privileged view but, to speak with Svetlana Alpers, with a overwhelming "microscopic taste for displaying multiple surfaces."[47]

In Un cabinet d'amateur, Georges Perec tells us the story of a remarkable exhibition in Pittsburgh, "conçu pour le seul plaisir, et le seul frisson, du faire-semblant," as he tells his reader in the last sentence of the novel.[48] The story revolves around a cabinet painting of the young painter Heinrich Kürz, who appears to have drawn the ultimate consequence from Brueghel's composition principle:

> "Et c'est là qu'ils auront une merveilleuse surprise: car le peintre a mis son tableau dans le tableau, et le collectionneur assis dans son cabinet voit sur le mur du fond, dans l'axe de son regard, le tableau qui le représente en train de regarder sa collection de tableaux, et tous ces tableaux à nouveau reproduits, et ainsi de suite sans rien perdre de leur précision dans la première, dans la seconde, dans la troisième réflexion, jusqu'à n'être plus sur la toile que d'infimes traces de pinceaux: Un cabinet d'amateur n'est pas seulement la représentation anecdotique d'un musée particulier; par le jeu de ces reflets successifs, par le charme quasi magique qu'opèrent ces répétitions de plus en plus minuscules, c'est une oeuvre qui bascule

46 Roemer Visscher, Sinnepoppen. 1614.
47 Svetlana Alpers, The Art of Describing. Dutch Art in the Seventeenth Century. Penguin Books, London 1989, p. 90.
48 Georges Perec, Un cabinet d'amateur. Histoire d'un tableau. Editions Balland, 1979 et 1989, p. 125. I thank Peter Geimer for having drawn my attention to this book.

dans un univers proprement onirique où son pouvoir de séduction s'amplifie jusqu'à l'infini, et où la précision exacerbée de la matière picturale, loin d'être sa propre fin, débouche tout à coup sur la Spiritualité vertigineuse de l'Eternel Retour."[49]

49 Perec 1989, pp. 22-23.

Lorraine Daston

Copiousness: the first impression of the painting[1] is of overflowing fullness, of much too much to look at, of vision surfeited. This response was common among vistors to early modern Kunst- and Wunderkammern, who often travelled from city to city, guidebook in hand, to gape in astonishment at the wonders of art and nature displayed in floor-to-ceiling abundance. When the French royal counselor Balthasar Monconys for example visited the Dresden collection of Elector August of Saxony in November 1663, he valiantly tried to list the contents of each room of the collection, but soon lapsed into summaries: "La 3. chambre est pleine de Tableaux, mais il n'y en a de bons, que d'*Albert* de *Lucas*, & un deluge de *Rubens*...La 4. est toute pleine de divers instruments de Mathematique, & d'une petite orgue toute de verre de Barcelona, tous les tüiaux, & la porte du cabinet...[La 7. automates] il y a une infinité d'oiseaux, & d'autres choses, qui

1 Jan Brueghel and Pieter Paul Rubens, *Vision* (1617), Museo del Prado, Inv. Nr. 1394.

chantent, remüent, & marchent...".[2] Such lists began as an attempt to focus the viewer's attention and to individualize the objects piled high in cabinets and vitrines, but they eventually lumped all except the most singular objects together, finally trailing off in an endless etcetera. The sheer quantity and variety of the objects, as well as the custom of arranging them cheek-and-jowl by one another, reduced the curious to a state of blurry-eyed exhaustion. Vision was first stimulated, and then overwhelmed. It is perhaps in wry commentary on this well-known aspect of early modern (and for that matter modern) tourism that the winged genius in the foreground of the Brueghel/Rubens painting shows a Venus figure, herself an allusion to the desire to see and possess[3], a small painting of Jesus healing the blind man (John 9: 1-12).

Was there an order hidden beneath the clutter the paintings, coins, gems, flowers, instruments, seashells, sculptures, books, tapestries, and drawings in the Breughel/Rubens Kunstkammer, or in the other early modern collections so eagerly sought out by travelers like Michel de Montaigne, Monconys, John Evelyn, John Locke, Felix Platter, and others? In order to answer this question, some further differentiations are necessary within the broad class of collections variously known as cabinets of curiosities, repositories, studioli, galleries, thesauri, and Schatz-, Kunst- Raritäten- and Wunderkammern.[4] Although the painting is of an imaginary Kunstkammer[5], peopled (so to speak) by allegorical figures, the collection is easily identifiable by type: it is a princely cabinet, depicted in a palatial setting and filled with precious objects. Princely collections like those of the Medici in Florence, Archduke Ferdinand II in Ambras, Emperor Rudolf II in Prague, Elector August in Dresden, King Frederick III in Copenhagen or Czar Peter I in St. Petersburg traced their ancestry directly back to the medieval Schatzkammern, and featured precious metals, jewels, and expensive craftmanship and artworks by recognized masters such as Dürer and Rubens. Even with the category of princely collections, emphases might differ according to individual tastes: August was a passionate collector of artisanal tools and machines; Rudolf II assembled a superb collection of paintings; Peter I favored human monsters, live as well as stuffed.[6] In contrast to the princely penchant for expensive artificialia, the col-

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2 Balthasar Monconys, *Voyages de M. de Monconys*, 4 vols. (Paris: Chez Pierre Delaulne, 1695), vol. 3, pp. 103-107.

3 Krzysztof Pomian, *Collectors and Curiosities: Paris and Venice, 1500-1800*, trans. E. Wiles-Portier (Cambridge: Polity, 1990).

4 On the early modern terminology of collections, see C. F. Neickelius, *Museographia, oder Einleitung zum rechten Begriff und nützlicher Anlegung der Museorum oder Raritäten-Kammern* (Leipzig/Breslau: Michael Hubert, 1727), pp. 2-3; Johann Daniel Major, *Unvorgreiffliches Bedencken von Kunst- und Naturalien-Kammern insgemein* [1674], reprinted in D. Michael Bernhard Valentini, *Museum Museorum, oder Vollständige Schau-Bühne aller Materialien und Specereÿen nebst deren natürlichen Beschreibung, Selection, Nutzen und Gebrauch* (Frankfurt a. M.: Johann D. Zunner, 1704), pp. 4-11; Paula Findlen, "The Museum: Its Classical Etymology and Renaissance Genealogy," *Journal of the History of Collections* 1(1989): 59-78.

5 Gisela Luther, "Stilleben als Bilder der Sammelleidenschaft," in Gerhard Langemeyer and Hans-Albert Peters, eds., *Stilleben In Europa* (Münster: Aschendorff, 1979), pp. 88-128, esp. pp. 121- 126. A number of the painting in this imaginary Kunstkammer can however be identified: S. Speth-Holterhoff, *Les Peintres flamands de cabinets d'amateurs au XVIIe siècle* (Brussels: Elsevier, 1957), pp. 53-55.

lections of physicians and apothecaries concentrated on naturalia: rarities like unicorn horns and quinine bark from South America were also pharmaceuticals; moreover, naturalia could usually be purchased far more cheaply than highly finished works of craftmanship or art.[7] Nevertheless, almost all collections, princely and scholarly, contained some mix of artificialia and naturalia, albeit in very different proportions and forms. In princely collections the nautilus shells, coral branches, and ostrich eggs that were staple naturalia of all collections were often elaborately worked in gold or encrusted in gems in order to increase their value and make them worthy of display, just as paintings might be set off in elaborate frames.[8] Hence even the naturalia became to some extent artificialia.

The Kunstkammer in the Breughel/Rubens painting follows this general pattern: artificialia dominate naturalia both numerically and visually. Paintings--especially the oversized rendition of a madonna encircled by a flower wreath, also by Breughel and Rubens and now belonging to the Louvre, that holds the eye at the far right side of the painting--command pride of place, followed by the shelves of sculpture in the upper center. This is a Kunstkammer in the narrow sense of the term. The naturalia are to be found in nooks and crannies: the vase of flowers next to the armillary sphere on top of the inlaid cabinet at the upper left; the basket of shells tucked between two paintings at the lower right; the gems (all sumptuously set) scattered before Venus and on top of the tapestry-covered table to her left; next to them the alabaster and agate goblet, possibly with a nautilus shell base, worked in gold; the parrot, two monkeys, and three dogs arranged among the paintings.[9]

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6 Joachim Menzhausen,"Elector Augustus' Kunstkammer: An Analysis of the Inventory of 1587," in Oliver Impey and Arthur MacGregor, eds., *The Origins of Museums: The Cabinets of Curiosities in Sixteenth- and Seventeenth-Century Europe* (Oxford: Clarendon Press, 1985), pp. 69-75, on p. 71; Thomas Da Costa Kaufmann, *The School of Prague: Painting at the Court of Rudolf II* (Chicago/London: University of Chicago Press, 1988); Oleg Neverov, "'His Majesty's Cabinet' and Peter I's Kunstkammer," in Impey and MacGregor, *Origins*, pp. 54-61, on p. 60.

7 For two such medical/naturalist collections, see Ferrante Imperato, *Dell'historia naturale* (Naples, Costantino Vitale, 1599) and Olaus Worm, *Museum Wormianum seu Historia rara rariorum* (Leiden: Elsevier, 1655) : both books depict the authors' collections in their frontespieces. On the relationship between medical simples and collecting see Paula Findlen, *Possessing Nature: Museums, Collecting, and Scientific Culture in Early Modern Italy* (Berkeley: University of California Press, 1994), pp. 248-256; on the early modern markets for naturalia and exotica see Antoine Schnapper, *Le Géant, la licorne et la tulipe: Collections et collectionneurs dans la France du XVIIe siècle* (Paris: Flammarion, 1988), pp. 219-223.

8 The figure of a nautilus cup with a coral branch base Southern German, belonged to the collection of Kurfürst August von Sachsen (early 17th century), today to the Staatliche Kunstsammlung Dresden, Grünes Gewölbe.

There are also instruments at least partially associated by 1617 with the study of nature--the two telescopes, the globe, the astrolabe and compass, the armillary sphere--as well as with architecture and engineering, but contemporaries would have unhesitatingly classed these among the artificialia, especially because the exemplars in the painting exhibit fine workmanship. (On the same grounds, one might have queried the classification of the gems and agates as naturalia: although their natural provenance is indisputable, they have been transformed by skilled artisans into ornaments.)

To return to the question of a hidden order: is there a common term that unites these diverse objects? With very few exceptions (perhaps the rather ordinary-looking brown dog scampering about in the sunlit gallery in the upper right of the painting?) all of the objects are ostentatiously costly, at least to the early seventeenth-century eye. We immediately recognize the high price tag on the strands of pearls, the antique busts, the artistic masterworks, the fancy instruments, and even the exotic animals; we are however less conscious of how valuable certain flowers and shells appeared to early modern Europeans. Although the bouquet of spring flowers in the blue porcelain vase (itself an expensive piece of exotica in 1617) is not as sumptuous as the garland of blossoms Breughel painted around Rubens' madonna, tulips and narcissi counted as luxury items even before the Dutch tulip craze of 1637, during which single bulbs could fetch 4000 guilders or more (approximately ten times the annual salary of a Leiden master carpenter at the time).These astronomical prices were admittedly anomalous, and none of the tulips in Breughel's bouquet seem to be of the especially coveted (and correspondingly expensive) white-flamed-with-red variety; nonetheless, such a massing of flowers still represented a considerable monetary investment--wealth here flaunted, since cut flowers of course fade more quickly than those left in the garden.[10] Shells in general did not compete in price with the most expensive flowering bulbs, but

9 Princely collections were often combined with a menagerie of exotic animals: in Dresden for example the dazed tourist exited from the chambers of filled with ostrich eggs and coconut shells, paintings, automata, petrified wood, instruments, etc. to the adjoining menagerie, which boasted bears (one white), lions, tigers, and two monkeys. Monconys, *Voyages*, p. 108.

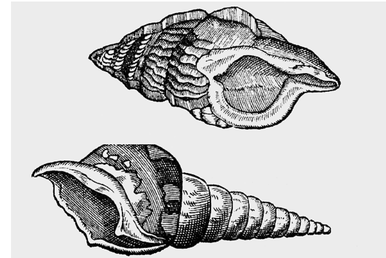
10 On the prices and economic meanings of flowers in seventeenth-century Dutch flower paintings see Paul Taylor, *Dutch Flower Painting* (New Haven/London: Yale University Press, 1995), pp. 2-16. The striped tulips were the result of a virus, and hence could not always be counted upon to breed true, increasing their rarety and value. Jan Breughel the Elder did include some of these striped tulips in other flower paintings, e.g. his *Flower Piece*, Coll. Thurkow, The Hague (also with a blue porcelain vase, apparently of Chinese origin).

there was also a brisk Dutch market for exotic varieties (mostly from the Indian Ocean), which supplied collectors throughout Western Europe in the seventeenth century.[11] Parrots and monkeys both carried emblematic meanings of imitation in the contexts of paintings like this one ("art the ape of nature")[12], but parrots additionally figured as costly presents in the Low Countries during the sixteenth and early seventeenth centuries. When Albrecht Dürer for example toured the Netherlands in 1520, among the many lavish gifts he and his wife received--sugar cane, a gold ring, porcelain, feathers from Calcutta--was a parrot.[13]

But there was a further feature, beyond costliness, that would have connected the naturalia in the Breughel/Rubens Kunstkammer for an early seventeenth-century spectator. Seashells, flowers, gemstones, and brightly colored bird feathers belonged to the category of the *lusus naturae*, or sport of nature. This was a notion ultimately traceable back to Pliny's *Historia naturalis*, but whose referents and significance expanded markedly in Renaissance natural history.[14] Pliny had remarked, specifically in connection with the variety of flowers, gems, and seashells, on nature's aesthetic bounty in these realms:

> "Ut nihil instituto operi desit, gemmae supersunt et in artum coacta rerum naturae maiestas, multis nulla parte mirabilior. tantum tribuunt varietati, coloribus, materiae, decori, violare etiam signis, quae causa gemmarum est, quasdam nefas ducentes, aliquas vero extra pretia ulla taxationemque humanarum opum arbitrantes, ut plerisque ad summam absolutumque naturae rerum contemplationem satis sit una aliqua gemma."[15]

These sentiments were often echoed by early modern naturalists who wrote not only on minerals but also about flowers and shells. The French surgeon Ambroise Paré for example exclaimed over the variety of seashells: "Il se trouve en la mer de si estranges et diverses sortes de coquilles, que l'on peut dire que la Nature, chambriere du grand Dieu, se joue en la fabrication d'icelles...".[16] The English naturalist Robert Plot, writing about the figured stones found in some Oxfordshire quarries, explained that it was "the wisdom and goodness of



11 For example, Philipp Hainhofer, the Augsburg purveyor of curiosities to several princely collections, bought shells for his clients at Dutch markets: Hans-Olof Böstrom, "Philipp Hainhofer and Gustavus Adolphus' Kunstschrank in Uppsala," in Impey and MacGregor, *Origins*, pp. 90-101, on p. 92.

12 For an emblematic interpretation of this painting and others, see Matthias Winner, *Die Quellen der Pictura-Allegorien in gemalten Bildergallerien des 17. Jahrhunderts zu Antwerpen* (Diss. Köln, 1957). On interpretations of Breughel's floral cartouches like that around the Rubens madonna, see David Freedberg, "The Origin and Rise of the Flemish Madonnas in Flower Garlands," *Münchner Jahrbuch* 32(1981): 115-135.

13 Jane Campbell Hutchison, *Albrecht Dürer: A Biography* (Princeton: Princeton University Press, 1990), p. 139. Dürer's celebrated aquarelle of the wing of a blue roller (Vienna, Albertina, 1512) bears witness to his own artistic fascination with the colors and textures of bird feathers.

14 Paula Findlen, "Jokes of Nature and Jokes of Knowledge: The Playfulness of Scientific Discourse in Early Modern Europe," *Renaissance Quarterly* 43(1990); 292-331.

15 Pliny, *Historia naturalis*, XXXVII.1.

16 Ambroise Paré, *Des Monstres et prodiges* [1573], ed. Jean Céard (Geneva: Droz, 1971), p. 102. The woodcut figure of shells appears on p. 117.

the *Supreme Nature*, by the *School-men* called *Naturans*, that governs and directs the *Natura naturata* here below, to beautifie the World with these varieties; which I take to be the end of such productions as well as most *Flowers*, such as *Tulips, Anemones, &c.* of which we know as little use as of *formed stones*."[17]

These personifications of a playful nature diverged from Aristotelian comparisons of nature's products to those of a human artisan. Naturalists in the Aristotelian tradition had never tired of pointing out how the most ordinary objects of nature, especially organic nature, were highly various and ingeniously constructed. But these diverse organic forms differed from the *lusus naturae* in serving equally diverse functions, which Aristotelians identified as the final causes of organisms and their parts. Nature's skill consisted in matching form to function with elegant economy: "nature does nothing in vain," as the scholastic maxim put it. In contrast, the naturalia of the Kunst- und Wunderkammer were admired for their excess of ornament, indifferent to function. What was the use so many different shapes and colors of flowers, shells, and gemstones? It was precisely this pointless variety and studied uselessness that linked luxury and ornamentation to play: all flaunted the workaday utility of ordinary objects, both natural and artificial. In seventeenth-century usage, the word "curiosity" could be used as the antonym of "utility", as when Bernard de Fontenelle, writing about the activities of the Académie Royale des Sciences in Paris, admitted that some parts of mathematics and physics (as opposed to history) "were only curious" rather than "useful".[18] This was one of the senses in which the objects of the princely Kunstkammer qualified as "curiosities": not only were trompe l'oeil paintings, nautilus shells turned into gold-handled pitchers, cutlery with handles of branching coral, delicate nested polyhedra of turned ivory, and other Kunstkammer items "curiosities" in the sense of being finely wrought (returning to the root sense of *cura*, or "care"); they were also "curious" in flaunting utility.[19] Extravagant of labor and materials, Kunstkammer objects were *objets de luxe*. Hence the personification of nature in the context of Kunstkammer

17 Robert Plot, *The Natural History of Oxfordshire* (Oxford: Theater, 1677), p. 121.

18 Bernard de Fontenelle, *Histoire du renouvellement de l'Académie Royale des Sciences en M.DC.XCIX et les éloges historiques* (Amsterdam: Pierre de Coup, 1709), p. 16; on the shift from "curiosité" to "utilité" as a motivation for Académie research, see Christian Licoppe, *La Formation de la pratique scientifique: Le Discours de l'expérience en France et en Angleterre (1630-1820)* (Paris: Editions la Découverte, 1996), pp. 88-126.

19 The figure shows Georg Haintz, *Stilleben mit Kunstkammerschrank*. Kopenhagen, Statens Museum for Kunst.

naturalia like tulips and exotic seashells was as virtuoso artisan, who more resembled the goldsmith, ivory-turner, or painter of flower pictures than Aristotle's humble shipwright.[20] Like the virtuoso artisan--like Breughel himself perhaps[21]--the nature of Kunstkammer naturalia played with form and matter in defiance of function.

The aesthetic of the Kunstkammer left its mark on early modern natural history and natural philosophy. In the specific case of tulips and seashells, seventeenth-century classifications fixed upon the dazzling appearances of these objects, and preserved their varieties. Linnaeus rebuked his predecessor in botanical taxonomy, Joseph de Tournefort, for having unnecessarily multiplied species by being too attentive to variable appearances: "Tournefort enumerates 93 Tulips (where there is only one) and 63 Hyacinths (where there are but two), and others have often been no less extravagant."[22] But Linnaeus himself was content simply to latinize the seventeenth-century names of shells coined according to their resemblances to everything from leopards to papal tiaras to snakeheads; Georges Cuvier was still complaining in 1790 about the state of the shell collection of the one-time Cabinet du Roi when it became part of the Muséum d'Histoire Naturelle during the French Revolution.[23] More generally, early modern naturalists showed a pronounced taste for *lusus naturae*, as the contents of the first scientific journals like the *Philosophical Transactions of the Royal Society of London*, the *Histoire et Mémoires de l'Académie Royale des Sciences*, and the *Acta eruditorum* amply testify.[24]

Let us return to the dazed onlooker of Brueghel's and Ruben's imaginary Kunstkammer. Wonders of art and nature are strewn about in studied profusion; even the more tidily hung paintings in the barrel-vaulted gallery to the upper right stretch from floor to ceiling; the lap-dog crouched under the telescope between Venus and the Cupid-like genius can barely move without stumbling over a pouch of coins or a volume of cosmography. The eye of the spectator flickers restlessly from object to object: wherever attention rests for a moment--on the red-and-blue feathered wings of the parrot (or those of the putto-genius), on the painting of the savage hunting scene above the sculptures, on the handsome bronze astrolabe at Venus' feet--it is almost immediately distracted to some other shiny, bright-colored surface. This splintering of attention mimicks the stupefied wonder evoked by the cabinets of curiosities themselves. This is the dumbstruck wonder that douses rather than ignites intense inquiry; in this sense, the cabinets of

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20 Aristotle, *Physics*, II.8, 199b26-30.

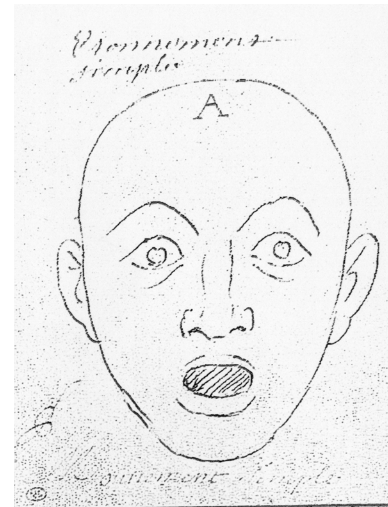
21 Simon Schama notes that seventeenth-century Dutch (and one assumes also Flemish) artworks, especially landscapes and flower paintings, were treated as commodities, and their makers as skilled artisans: Schama, *The Embarrassment of Riches. An Interpretation of Dutch Culture in the Golden Age* (Bekeley: University of California Press, 1988), p. 318.

22 Carl von Linnaeus, *The Critica Botanica 0f Linnaeus* [1737], trans. Sir Arthur Hort, rev. Miss M.L. Green, with an Introduction by Sir Arthur W. Hill (London: Ray Society, 1938), Aphorism 259, p. 122.

23 Schnapper, *Le Géant*, pp. 74-75.

24 Lorraine Daston and Katharine Park, *Wonders and the Order of Nature, 1150-1750* (New York: Zone Books, 1998), pp. 215-254.

curiosity, by their very prolixity, killed curiosity. Both Francis Bacon and René Descartes were therefore disapproving of the wonder that exhausts vision and fragments the faculties. Bacon described wonder as "broken knowledge" and disdained the aimless trials of empiricists who "ever breaketh off in wondering and not in knowing."[25] Although Descartes deemed wonder the first of the passions, and essential for the acquisition of new knowledge, he was equally critical of excessive wonder or astonishment (*estonnement*) which froze the whole body and mind.[26] Yet both Bacon and Descartes owed a secret debt to the artificialia and naturalia of the Kunst- und Wunderkammer. Each insisted that the ancient distinction between art and nature was false, that nature and art differed only in their efficient causes (as Bacon put it)[27] or in the fineness of their mechanisms (Descartes)[28], not in their ontological essences. And each appealed to examples--*lusus naturae*, automata--made visible and concrete to themselves and their readers in the Kunst- and Wunderkammer objects that deliberately blurred the boundary between art and nature. Although the myriad varieties of tulips and shells that so delighted seventeenth-century viewers of Brueghel's and Rubens' Kunstkammer have disappeared from scientific taxonomy, the vision of art and nature unified endures.



25 Francis Bacon, "Valerius Terminus, or The Interpretation of Nature," in *Lord Bacon's Works*, ed. Basil Montagu, 16 vols. (London: William Pickering, 1825-34), vol. 3, p. 246.

26 René Descartes, *Passions de l'âme*, Art. 73, in *Oeuvres de Descartes*, ed. Charles Adam and Paul Tannery, 12 vols. (Paris: Léopold Cerf, 1897-1910), vol. 11, p. 118.The figure is taken from Charles Le Brun, who based his lectures to the Académie de Peinture in Paris in 1668 on Descartes' *Passions de l'âme*: Musée de Louvre, Paris, G.M. 6465.

27 Bacon, "Description of the Intellectual Globe," in *Works*, vol. 15, p. 153-154.

28 Descartes, *Principes de la philosophie* [Latin 1644, French 1647],, Art. 203, in *Oeuvres*, vol. 9, pp. 302-303.