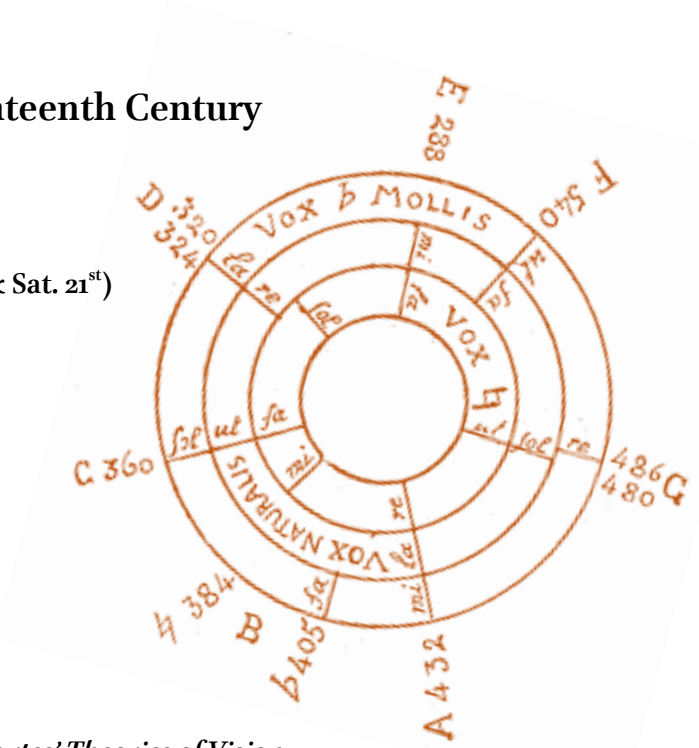
Cartesian Images
Picturing Natural Philosophy in the Seventeenth Century

19-21 March 2020, KU Leuven
Institute of Philosophy, Kardinaal Mercierplein 2
Kardinaal Mercierzaal (Thu. 19th) & Raadzaal (Fri. 20th & Sat. 21st)
Organisers: Mattia Mantovani & Davide Cellamare



Book of Abstracts

Delphine Bellis (Université Paul Valéry, Montpellier)
The Status of the Retinal Picture for Gassendi's and Descartes' Theories of Vision

Kepler's discovery of the function played by the retinal picture constituted a challenge for theories of vision at the beginning of the 17th century. In this talk, I will compare Descartes' and Gassendi's interpretations of the role of the retinal picture for vision. Whereas Descartes seemed to have no problem integrating Kepler's results in his *Dioptrique*, this was quite different for Gassendi. In 1634-1635, he conducted, together with Peiresc, several anatomical experiments in order to better understand the eye's structure and the function of each of its parts. Peiresc and Gassendi explored several possibilities to account for the way vision could occur on the basis of the retinal picture (one of which being that the choroid behind the retina served as a concave mirror that would reflect the picture toward the centre of the eye and put it upright). The formation of two different pictures in both eyes was also a problem for Gassendi in order to account for binocular vision: how is it that we see one object and not two? How to explain the perception of one unified field of vision? Even if these questions were already addressed by ancient optics, it became all the more acute in that light rays substituted for visual rays and that the prominent bodily dimension represented by the retinal picture replaced the Scholastic visible or intentional *species*. I will follow how Descartes and Gassendi elaborated their solution and compare it to Mersenne's. My hypothesis about this intense reflection and divergence of both authors on the topic is that the discovery of the two inversed and reversed retinal pictures constituted a threat to Gassendi's empiricist theory of knowledge, which wasn't the case for Descartes'.

Susanna Berger (University of South California)
On Minim Visual Culture in the Generations around Descartes

This paper uncovers some of the paradoxical forms in which Italian and French artists, philosophers, scientists, and practitioners of the generations around Descartes first theorized visual expertise. On the one hand, this period was characterized by a rise of naturalism, empiricism, and a commitment

to using visual representations in the transmission of knowledge among networks of viewers who trusted what they saw. On the other hand, this moment was characterized by scepticism and deceit, a mistrust of the visual and visual experience, as well as an enjoyment of playful images that were unstable. My paper will explore the co-existence of these disparate strands and their relationship to one another in Minim visual culture. I shall argue that the period that saw the rise of thought-out, carefully articulated, and shared practices of observation and representation was also the era of mystic visions and philosophical, religious, and artistic questioning of the limits of visual experience. It is precisely the multivalent nature of vision that helped to propagate the investment in visual expertise at this time in Minim circles.

Annie Bitbol-Hespériès (Paris)
Descartes' Writings and the Use of Anatomical Images dealing with Medical Issues: Contextualization, Innovation and Reception

My talk will comprise three parts:
I) I will recall the crucial use of texts containing anatomical engravings in the writing of the part devoted to the study of Man in the *Le Monde*, as well as the key importance of attending dissections and performing dissections, mainly of hearts and brains. This is all the more important since Descartes' medical knowledge was based on the best illustrated textbooks of his time : "Vesalius and the others", Fabricius of Aquapendente , Caspar Bauhin.
II) This anatomical knowledge is linked with reliable medical evidence based upon observation in Descartes' first published book: *Le Discours de la méthode* together with *La Dioptrique*. From the *Discourse* onwards, Harvey's demonstration of the circulation of the blood played an important role in Descartes' investigations on the "Nature of Man". I will also mention the striking contrast between the care given to the images in *La Dioptrique* and the poor quality of Descartes' drawings.
III) I will address the considerable gap in the treatment of anatomical illustrations in the posthumous publications of *L'Homme*, that is between the Latin translation of 1662 and the French Parisian edition of 1664. Why such a discrepancy? How can we understand it? What about the accurate representation of the parts of the human body in these illustrations set in context? What is their role in the new medical knowledge? What are their links with philosophical and scientific implications? I will conclude by emphasizing the significant influence of these anatomical images.

Maria Conforti (University of Rome)
Illustrating Nerves: Images and Theories after Descartes

The brain and the nerves became the object of more or less accurate illustrations and representations by the second half of the 17^{th} century, following Descartes' works. My sources will be treatises – by Thomas Willis, 1664 and 1667; by Ijsbrand Diemerbroeck, 1672; by Raymond de Vieussens, 1684 – but also the articles and *mémoires* in European learned journals and other printed documents, as anatomical fugitive sheets and illustrations for the instruction of surgeons.

Mihnea Dobre (ICUB-Humanities, Bucharest)
Depicting Cartesian Cosmology in the Seventeenth Century

In 1664 two of Descartes's unpublished manuscripts have been printed in Paris. One was the *Traité de la Lumiere*, a fictional account of the world, which included Descartes's early cosmological views. The other one was *L'Homme*, a treatise depicting the structure of the human body in mechanical terms. Both publications abounded in illustrations. However, the case of the *L'Homme* is more famous, due to Claude Clerselier's comments in the preface. Another edition of the treatise was produced two years earlier in the Netherlands. Florent Schuyl had published a Latin version, which was lavishly illustrated with realistically anatomical representations. In his preface to the French edition of the text, Clerselier argued in favour of his own edition, which include a different set of illustrations, commissioned to two medicine professors. The case is noteworthy, since Clerselier argues for an epistemic role of the illustrations. Less noticeable is a brief remark of Clerselier regarding the publication of the other tract, the *Traité de la Lumiere*, which was perceived by him as printed too quickly. Such strategy would allegedly hinder the inclusion of better illustrations, a correction that was supposedly made by Clerselier himself in the edition of *Le Monde* (1677), when the two treatises were printed together.
The paper will examine the context of the publication of these two treatises and especially the role of the illustrations in supporting Descartes's cosmology. Beside comparing the illustrations of the 1664 and the 1677 editions of the *Traité de la Lumiere*, I argue that at Descartes's death in 1650, his public cosmology was the one of the *Principia philosophiæ*. In the 1650s and the 1660s, as his correspondence and unpublished papers were printed, his cosmology received a much broader reception, including alternative readings that were only sketched by Descartes's himself. In the paper, I examine how the variety of Cartesian cosmologies benefitted from the newly published illustrations in Descartes's treatises.

Sietske Fransen (Bibliotheca Hertziana - Max Planck Institute for Art History, Rome)
Between Seeing and Thinking: The Art of Depicting Microscopic Observations

This paper will trace the impact of Descartes's "clear and distinct ideas" and its impact on the depiction of microscopic observation. As has been argued previously by scholars of seventeenth-century microscopy, Descartes's particles could be deduced clearly and distinctly by the mind, but were not meant to be observed. However, not everyone realised this. Several decades after Descartes's death, Antoni van Leeuwenhoek, for example, followed Descartes's illustrations as visual guidelines, which lead Leeuwenhoek to contradict the philosopher's theories about form and shape. This example will show how images can be perceived and misinterpreted when taken as observations instead of abstract depictions of the mind's eye.

However, what will form the core of this paper, is how the understanding of images as scientific instruments and as part of the scientific persuasion changed in this period. The drawing of microscopic observations in the seventeenth century will be used as the epitome of combining sense and ratio in any illustration. While the eye observed, the hand had to draw the perceived, something that had not yet seen before, nor had it been defined. Descartes's visual strategies in depicting the abstract thus received another function, one that was eagerly taken on by Leeuwenhoek while he tried to design a method of depicting that what he understood to have seen.

Gary Hatfield (University of Pennsylvania)
L'Homme / De Homine: *Images as Interpretations*

Manuscript versions of *L'Homme* came to the respective editors with only a few extant diagrams. But the text specified a plethora of figures, explicitly referred to as having numerical and alphabetical labels to details within each image. Clerselier and Schuyl each had drawings made, and indeed Clerselier received two sets of drawings, from Gutschoven and La Forge, from which he most often used those of Gutschoven. Schuyl's drawings were mainly printed as etchings, Clerselier's were all wood cuts.
Because the drawings had to be produced solely from the text and the figural prompts, their makers were forced into a situation of hypothesizing or guessing what Descartes had in mind, or indeed, as Clerselier reports of La Forge, of rationally reconstructing the drawing that should accompany the text in order to best make sense of it.
In working without figures provided by Descartes, the illustrators were forced to make interpretive choices. These choices show us how the mechanisms specified by Descartes can be thought to have worked. These figural interpretations allow us to see what construals are consistent with Descartes' text, and they may draw our attention to points that are left implicit or unstated by the text. Of course, a picture being worth many words, images are bound to show things not explicitly called for in the text. But in the case of Descartes' intricate account of distance perception, I find that comparison of Gutschoven's images with Schuyl's brings out an important interpretive possibility that Gutschoven chose to emphasize, concerning the relations among various "cues" for distance: the accommodation of the lens and the convergence of the eyes. The text can be read so that these two are yoked together, although Descartes doesn't say so in so many words. Gutschoven's decision to render a binocular system even when the text uses the singular form of the noun "eye" (*l'oeil*) makes the unity of the mechanisms for distance perception explicit. An aspect of this reading is then confirmed in La Forge's commentary on any earlier textual description of distance perception, which we must consider as an independent confirmation, taking Clerselier at his word that La Forge sent in his images and commentary independently of Gutschoven.

Christoph Lüthy (Radboud University, Nijmegen)
The Paradox of Figured Particles from Descartes to De Raey

Descartes' natural philosophy as proposed in the *Essays* and the *Principia* was widely regarded as Democritean, despite his explicit anti-atomism. This reputation had much to do with his illustrations, which depicted a micro-world populated by rigid geometrical formlets. The status of these little shaped particles is ambivalent within his own philosophy, and led to interesting discussions between Descartes and his correspondents, on the one hand, and to divergent iconographical developments among Cartesians, on the other. This lecture will (1) sketch the relation between figuration and atomism in general; (2) mention three specific tensions surrounding the figured particles Descartes proposed (viz. their origin, number and derivation); and (3) discuss the iconographical aftermath, with a particular focus on a few case studies.

Gideon Manning (Claremont Graduate University)
***False Images Do Not Lie*: *Mechanism and Medicine in Descartes'* Treatise on Man**

Illustrations and paper technologies contributed to and enhanced the study of anatomy during the sixteenth century, not least by providing more accurate representations of the human body and allowing for the dissemination of consistent images. This paper documents a moment in anatomical illustration involving the disputes over Rene Descartes' posthumously published *Treatise on Man* (1662/1664), a work with its own convoluted paper trail involving multiple manuscripts, a Latin translation published prior to the original French, and three sets of illustrations made by three different physicians: one set for the Latin edition and two others for the French edition. Focusing on these illustrations and the grammar of anatomical illustrations, they appear to model how the visible movements of the body might be caused, with little apparent attention to accurately describing the parts of the body. In the medical terminology of the period, these illustrations are about *actio*—action or operation—and were conceived as an answer to the question of how the body might operate and not necessarily how it actually does operate. In this way, the illustrations provide an alternative to traditional anatomical illustrations focused on both *historia* and *actio* together, i.e., on how the body is actually structured and, given this structure, can be known to operate. Building on these claims, this paper concludes by reading the illustrations of the *Treatise* as pointing the way toward a possible interpretation of Descartes' mechanism and teleological commitments.

Mattia Mantovani (KU Leuven)
Spirits or Clocks? Visualization Strategies of the Human Body among Cartesians

Some ten years after Descartes' death, Florent Schuyl, Louis de La Forge and Gerard van Gutschoven prepared three different sets of illustrations for the posthumous edition of his *Traité de l'Homme*. Schuyl's appeared in his own Latin translation of the work (*De homine*, Leiden 1662). La Forge's and Van Gutschoven's were both used by Clerselier – with a preference for the latter – for the Paris edition of 1664. The three were working with slightly dissimilar manuscripts, and differed in medical and philosophical formation, as well as in visual culture and intents. Accordingly, the images they provided highlighted some quite different aspects of Descartes' account of human physiology. In my talk, I'll consider the import and implications of these alternative visualization strategies, and their legacy.

The Latin and the French edition had indeed largely complementary circulations; so did their images. As for van Gutschoven's, in particular, I shall examine a series of engravings made in the 1670-1680s to be found in the lecture notes of the students of Leuven University, where van Gutschoven had taught from 1646 to his death in 1668. For its part, Schuyl's illustrations guided – among the other things – the blueprints for a "human circulatory statue" published by Salomon Reisel on the 1680 issue of the *Miscellanea Curiosa... sive Ephemeridum medico-physicarum Germanicarum Curiosarum*, the first medical journal of the time.

I'll show that the separate circulation of van Gutschoven's and Schuyl's images brought to light some lurking tensions of Descartes' account, and urged these competing principles of Descartes' doctrine to drift apart, thereby leading to the emergence of a French-optical and a Latin-medical-styled depiction of the human body among his followers.

Carla Rita Palmerino (Radboud University, Nijmegen)

"Ils se trompaient d'ailleurs tous deux": Galileo's and Descartes' Representations of Ebb and Flow

In June 1640, Descartes wrote to Mersenne that his own explanation of the tides had nothing in common with Galileo's. De Waard commented drily: "Ils se trompaient d'ailleurs tous deux", as they both failed to identify lunar attraction as the real cause of the tides. While Galileo believed that ebb and flow were the effects of the double motion of the Earth, Descartes maintained they were brought about by the circulating vortex of subtle matter. As I wish to show in this lecture, Galileo and Descartes were also wrong as they both tried to conceal some important discrepancies between their proposed explanation and the known phenomena. However, the engravings that they employed to illustrate their respective theories contained visual clues that helped their contemporaries spot these very discrepancies and to criticize them.

Isabelle Pantin (IHMC – Ecole normale supérieure, Paris)

Is the 'Philosophical Image' an Invention of the Cartesian Literature?

In the sixteenth century, the 'scientific' books, almost in all disciplines, were lavishly illustrated. The technique in use facilitated the proliferation of images: woodcut blocks were easy to insert in the lay-out, and their cost was relatively moderate. A great deal of ingenuity was spent in trying to adapt the rich expressive capacities of the language of images to the different purposes of 'scientific' texts: pedagogy, documentation, *demonstratio* (in the rhetorical meaning), reasoning, and the conveying of a gamut of feelings, from pious admiration and awe to the pleasures of curiosity. During the next century, an evolution occurred. The technique of copper engraving, more costly and necessitating more complex operations, gained ground over woodcutting, and, in all domains, the use of images became more selective. In natural philosophy, notably, it seems that discrimination increased between the different types of images (in relation to different functions). The distinction between descriptive images (corresponding to natural history) and proper 'philosophical images' (a kind of embodied philosophical arguments) emerged more or less clearly. The Cartesian images, in *La Dioptrique*, *Les Météores*, and perhaps even more in the *Principia philosophiæ* appear as the exemplar of these 'philosophical images'. In some ways, Descartes could be viewed as their inventor, if one considers their deep affinities with the complex blend of observation, geometrical reasoning and fiction that characterises his discourse. This idea will be put to test through a contextualising and comparative approach.

Geert Vanpaemel (KU Leuven)

How to Walk under Water: Scientific Illustrations in Leuven Student Notebooks during the Cartesian Revolution

One of the distinguishing features of Leuven student lecture notes are the series of engravings that embellish the text. These engravings can be found in extant notebooks from about 1660 until the end of the eighteenth century. Some of them are emblematic, others have a scientific content. For some of them it is possible to trace the exact origin of the image, for others it is fairly straightforward to understand the purpose of the image in support of the lectures. But still, many questions remain. The engravings were made and sold by several Leuven printers, but were they also responsible for the choice of images and the explanatory text? Which topics were selected for visual illustration, and how did this have an impact on the teaching practices in the classroom? In the lecture I will

consider the hypothesis that the Leuven engravings may have been produced fairly independently from the philosophy curriculum. As the engravings represent a clearly 'modern' approach to natural philosophy, often even unequivocally Cartesian, at a time when the philosophy curriculum was still straddling between Aristotelian and Cartesian doctrines, this may suggest that the printers should be considered as independent sources of knowledge available to students in the university town.