

SENSES AND PERCEPTION IN SEVENTEENTH-CENTURY ACADEMIA GUSTAVIANA AND GUSTAVO-CAROLINA

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In a certain respect, the discussions about sense perception are at the center of philosophical change in the seventeenth century. To illustrate this it suffices to look at the *First Meditation* of René Descartes:

Whatever I have up till now accepted as most true I have acquired either from the senses or through the senses. But from time to time I have found that the senses deceive, and it is prudent never to trust completely those who have deceived us even once.¹

What Descartes is suspicious of is foremost any knowledge coming from the sense organs, and thus questioning the validity of sense perception is at the forefront of his thought. Though the meditator does not say this anywhere explicitly, he thus implicitly criticizes the Aristotelian understanding of the world. The Aristotelian understanding is explicated in the beginning of *Metaphysics*:

All men naturally desire knowledge.² An indication of this is our esteem for the senses; for apart from their use we esteem them for their own sake, and most of all the sense of sight. Not only with a view to action, but even when no action is contemplated, we prefer sight, generally speaking, to all the other senses. The reason for this is that of all the senses sight best helps us to know things, and reveals many distinctions.³

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¹ René Descartes, *The philosophical writings of Descartes*, 2, trans. by John Cottingham, Robert Stoothoff, and Dugald Murdoch (Cambridge: Cambridge University Press, 1985), 12 [AT VII 18].

² When considering the translation proposed by Martin Heidegger (*Sein und Zeit*, 171) who renders εἰδέναι as “to see”, the connection between senses and knowledge about the world is even stronger.

³ Aristotle, *Metaphysics*, trans. by Hugh Tredennick, vol. 17–18, Aristotle in 23 volumes (Cambridge, MA: Harvard University Press, 1933), 1.980a. Cf. the Latin translation of Basilios Bessarion: “Omnes homines natura scire desiderant. Signum autem est sensuum

Thus the question about the scope and usefulness of senses becomes one of the main discussion points during the seventeenth century, not only due to Aristotelians and Cartesians but also due to Hobbes' stress on sense perception, Spinoza's understanding of the inadequacy of the senses, and Locke's later reinterpretation of the old concept of *tabula rasa*. Such ambivalence towards sense perception is also present in the seventeenth-century disputations of *Academia Gustaviana* and *Academia Gustavo-Carolina*. As subjects, sense organs and perception are mentioned in eight disputations of varying quality and length (8 to 40 pages).⁴

Table 1. Disputations of *Academia Gustaviana* and *Gustavo-Carolina* dealing with sense organs and perception

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| <p>Schomerus, Petrus [P] – Ulsbeckius (Ulsbeckius), Magnus (Magnus Paulinus) [R] Disputatio inauguralis, de anima sensitiva in genere, et in specie de sensibus exterioribus, quam ... in Regia Gustaviana, quae Dorpati ... est, Academia, ... sub praesidio ... Petri Schomeri ... pro summo in philosophia gradu, ... publicae disquisitioni submittit Magnus Paulinus Ulsbeckius ... ad diem 15. Octob. ... – Dorpati Livonorum, 1634 : J. Pistorius. [20] p. 4°. Grat.: Petrus A. Schomerus, Johannes Raulinius</p> |
| <p>Schomerus, Petrus [P] – Lerbeckius, Ericus [A & R] Disputatio philosophica de sensibus in genere et in specie de externis: quam, ... in Regia Academia Gustaviana, quae Dorpati est ... sub praesidio ... Petri A. Schomeri, ... publicae ... disquisitioni, ad diem [31. Octo]bris, ... submittit Ericus Petri Lerbeckius, ... author et respondens. – Dorpati Livonorum, 1638 : Lit. acad. [16] p. 4°. Grat.: Ericus Matthiae, Johannes E. Stregn.</p> |
| <p>Savonius, Michael [P] – Lerbeckius, Ericus [R] Disputatio philosophica de sensibus internis; quam, ... in Regia Academia Gustaviana, quae Dorpati ... est sub praesidio ... Michaelis Savonii, ... pro magisterii philosophici privilegiis et immunitatibus consequendis, publicae disquisitioni et censurae, ad diem [16] Octob. ... submittit Ericus Petri Lerbeckius, ... – Dorpati Livonorum, 1639 : Typ. acad. [16] p. 4°. Grat.: Laurentius Ludenius, Isacus Sicrenius</p> |

dilectio nam et absque usu propter seipsos amantur prae ceteris autem qui per oculos fit. Non enim ut agamus solum, verum etiam nil acturi, ipsum videre prae omnibus aliis, ut ita dicam eligimus, causa autem est, quod sensuum hic vel maxime nos cognoscere quicquam facit multasque differentias manifestat.” Aristoteles, *Aristotelis Stagiritae Metaphysicorum Libri XIII, Bessarione interprete* (Lugduni [Lyon]: Iuntae, 1579), 3–4.

⁴ These descriptions of disputations rely on the bibliography of Ene-Lille Jaanson, *Tartu Ülikooli trükikoda 1632–1710: ajalugu ja trükiste bibliograafia = Druckerei der Universität Dorpat 1632–1710: Geschichte und Bibliographie der Druckschriften* (Tartu: Tartu Ülikooli Raamatukogu, 2000).

| |
|---|
| <p>Johannes Erici Stregnensis (Stiernstråle) [P] – Uraelius, Faderus [A & R] Disputatio physica de visu, quam ... in Regia Academia Gustaviana, quae Dorpati est ... 21. Octobris, anno 1643. ... publice ... praeside ... Johanne Erici Stregnensi, ... proponit Faderus Arvidi Uraelius, ... author et respondens. – Dorpati Livonorum, 1643 : Typ. acad. [8] p. 4°.</p> |
| <p>Johannes Erici Stregnensis (Stiernstråle) [P] – Emzelius, Laurentius [R] Disputatio physica de sensibus in genere, et de auditu in specie; quam ... in Regia Academia Gustaviana, quae Dorpati ... est ... praeside ... Johanne Erici Stregnensi, ... publicae ventilationi submittit Laurentius Erici Emzelius, ... die [] Aug. ... – Dorpati Livonorum, 1645 : J. Vogelius. [12] p. 4°.</p> |
| <p>Preusius (Preutius, Preuss), Georgius [P] – Halenus (Klingius), Johannes [R] Disputatio psychologica de sensibus; quam, ... in ... Academia Gustaviana, sub praesidio ... Georgii Preusii, ... publico ... examini submittit Johannes Steph. Klingius, auctor et respondens, ad diem [] Junii ... – Dorpati Livonorum, 1655 : J. Vogelius. [16] p. 4°. Grat.: praeses (Georgius Preusius)</p> |
| <p>Sjöberg, Gabriel [P] – Westerman, Andreas [R] Dissertatio philosophica de erroribus sensuum, quam ... in Regia Academia Gustaviano-Carolina Dorpatensi, praeside ... Gabriele Siöberg, ... publico examini subjicere constituit ... Andreas Westerman ... ad diem 18. Junii anni MDCXCII. ... – Dorpati, [1692] : J. Brendeken. [40] p. 4°. Ded.: Nicolaus Gyllenstålpe</p> |
| <p>Dau, Michael [P] – Carstenius, Abrahamus [A & R] Exercitatio physica de sensibus brutorum, quam ... in ... Pernaviensi Academia, sub moderamine ... Michaelis Dau, ... publico examini ... ad d. [] anni M.DC. LXXXIX. ... submittit Abrah. P. Carstenius, ... auctor et respondens. – Pernaviae, [1699] : J. Brendeken. [4], 32, [4] p. 4°. Ded.: Nicolaus Gyllenstålpe Grat.: Gabriel Siöberg, praeses (Michael Dau), Andreas Strandenius, Nicolaus Ursinus, A. Willander, Joh. Martini Uddgreen, Marcus Helsingius</p> |

Though some of these works can be considered medical⁵ or dealing with psychology, the aim of the present essay is to analyze these disputations as reflections of the changes in thinking that took place in the seventeenth century – in other words, philosophically.

As it appears from Table 1, those disputations cover the period beginning from two years after the establishing of the Academia (1634) until its relocation to Pärnu (1699). These works can be divided very broadly into two categories. The first six (from the years 1634–55) deal with Aristotelian physics and the last two (1692 and 1699) take their starting point foremost

⁵ Kaarina Rein, “Andreas Arvidi disputatsioon *De natura et constitutione medicinae* arstiteadusliku mõtte arengu peegeldajana 17. sajandi Tartu ülikoolis”, *Mäetagused*, 39 (2008), 2, 16.

from the theories of Descartes and other Cartesian authors. The disputation of Westerman is a thorough exposition of the Cartesian understanding of perception, and the work of Carstenius (about the senses of the brutes⁶) presents the ideas of Descartes in the forms of theses and antitheses and offering also some critique.

Though the Cartesian turn has often been described as an outcome of the skeptical (Pyrrhonic) attitude towards thinking, and thus resulting from applying methodological doubt to the sciences,⁷ the aim of the present essay is to show how one of the main differences between Cartesian and Aristotelian worldviews arose not from methodological doubt but from differences in understanding sense perception. For this purpose I have examined mainly two of the disputations – those of Magnus Ulfsbeckius and Andreas Westerman – and compared the contrasting philosophical backgrounds that are evident from the exposition of the problem of perception.

The Aristotelian worldview is apparently best presented in the disputation of Magnus Ulfsbeckius *De anima sensitiva in genere, et in specie de sensibus exterioribus* (About the sensitive soul and especially about exterior senses), written under the supervision of Petrus Schomerus. This disputation was presented for an academic degree (*pro gradu*) and it is also the earliest and longest of the *Academia Gustaviana* works on sense perception. Magnus Ulfsbeckius had already matriculated in 1627 in Uppsala, and from 1633 was continuing his studies in Tartu.⁸ It appears also that later works dealing with the same subject used this work as a reference as they contain some sections that are very similar to the work of Ulfsbeckius. This can admittedly also be due to the fact that the authors use similar literature.

⁶ Carstenius brings out the etymology *brutum ex βρωτός*.

⁷ *Tartu Ülikooli ajalugu 1632–1982, I*, ed. by Helmut Piirimäe (Tallinn: Valgus, 1982), 104b; *Descartes ja tema ideede jõudmine Baltimaile 17. sajandil ja 18. sajandi algul: René Descartes'i 400. sünniaastapäevale pühendatud näitus Tartu Ülikooli Raamatukogus, aprill–juuni 1996 = Descartes und der Eingang Seiner Ideen in die Schwedischen Ostseeprovinzen Estland und Livland im 17. und Frühen 18. Jahrhundert: Ausstellung aus Anlass des 400. Jubiläums von René Descartes in der Universitätsbibliothek Tartu von April bis Juni 1996*, ed. by Arvo Tering et. al. (Tartu: Tartu Ülikooli Raamatukogu, 1996), 21.

⁸ *Album academicum der Universität Dorpat (Tartu) 1632–1710*, ed. by Arvo Tering (Tallinn: Valgus, 1984), no. 127 (152).

Table 2. The literature cited by Magnus Ulfsbeckius in his disputation *De anima sensitiva in genere, et in specie de sensibus exterioribus*⁹

| Author | Work cited | Notes |
|------------------------|---|---|
| Aristotle | <i>Aristotelis Physicae auscultationis lib. 8. De Coelo 4. De Gener. et Corruptione 2. Meteorologicorum 4. De Mundo 1. De Anima 3. De Sensu et sensibilibus, lib.1. De Memoria et reminiscentia 1. De Somno et vigilia 1. De Insomniis 1. De Diuinatione per somnum 1. De Iuuentute, senectute, vita et morte 1. De Respiratione 1. De Lo[n]gitudine et breuitate vitae 1</i> | |
| Hieronymus Cardanus | <i>De varietate rerum</i> | † 1576, Italian mathematician, astrologer, alchemist (<i>Tartu Ülikooli ajalugu, I, 211a</i>) |
| Caelius Aurelianus [?] | | fl. 5th century, Roman physician |
| Jacopo Zabarella | <i>De rebus naturalibus libri XXX</i> | † 1589, Italian logician and interpreter of Aristotle (<i>Tartu Ülikooli ajalugu, I, 186</i>) |
| Julius Caesar Scaliger | <i>Exotericarum Exercitationum</i> | † 1558, Italian philosopher (interpreter of Aristotle) and medic (<i>Tartu Ülikooli ajalugu, I, 202, 216a, 237b</i>) |
| Fortunio Liceti | <i>De ortu animae humanae libri tres</i> | † 1657, Italian medical scientist and interpreter of Aristotle, described transmission of characteristics, supporter of abiogenesis |
| Johannes Magirus | <i>Physica peripatetica ex Aristotele, eiusque interpretibus collecta, et in sex libros distincta</i> | † 1596, popular interpreter of Aristotle, pupil of Zabarella, active in the Lutheran University of Marburg (<i>Tartu Ülikooli ajalugu, I, 229b</i>) |
| Benito Pereira | <i>De communibus omnium rerum principii libri quindecim</i> | † 1610, Spanish Jesuit and exegete |

⁹ In tables 2 and 3 there are only authors who are cited by name or by book and can be considered scientific – citations of ancient poets are not represented. If the author cited is also mentioned in *Tartu Ülikooli ajalugu 1632–1982, I, I*, I have indicated the page number and column.

| Author | Work cited | Notes |
|----------------------------------|--|--|
| Johann Scharf | <i>Physica, auctior et correctior; in qua methodo Aristotelica in scholis peripatheticorum usitata proponuntur</i> | † 1660, Lutheran theologian and philosopher, active in Wittenberg |
| Christoph Scheibler | <i>Disputatio psychologica de sensibus exterioribus</i> [?] | † 1653, interpreter of Aristotle and Lutheran theologian, active in Giessen, Marburg and Dortmund |
| Gregor Horst | <i>De Natura Humana Libri duo; Quorum prior de corporis structura, posterior de anima tractat, Ultimo elaborati, Commentariis aucti, figuris[ue] nobis Anatomicis aere incisus exornati. Cum praefatione de Anatomia vitali & mortua pro conciliatione Spagyricorum & Galenicorum plurimum inserviente</i> | † 1636, medical scientist, active in Giessen, tried to unite Paracelsean medicine with Hippocratean (<i>Tartu Ülikooli ajalugu, I, 238a</i>) |
| Aegidius <Romanus> | <i>Expositio in libros De anima Aristotelis cum textu</i> | † 1316, pupil of Thomas Aquinas, active in Paris |
| | <i>Commentaria Collegii Conimbriensis, Societatis Iesu, in tres libros Aristotelis de Anima</i> | Commentary of the works of Aristotle published by the Jesuits of the University of Coimbra (1592). |
| Nicolaus Galenus Regius | <i>De usu partium corporis humani libri XVII</i> | † ca 200, Greek medical scientist and philosopher (<i>Tartu Ülikooli ajalugu, I, 32a, 229b, 232a, 237a, 251b, 252a</i>) |
| Gaius Caesarius Plinius Secundus | <i>C. Plinii Secundi Naturalis historiae opus</i> | † 79, Roman philosopher and officer |
| Armandus <de Bellovisu> | <i>De declaratione difficultium terminorum tam theologialium, quam philosophiae</i> [?] | † 1334[?], Dominican theologian and philosopher |

All *Academia Gustaviana* works dealing with exterior senses, ie. Lerbeckius (*De sensibus in genere et in specie de externis*), Uraelius (*De visu*), Emzelius (*De sensibus in genere, et de auditu in specie*), and Halenus (*De sensibus*), use mostly the same authors as Ulfsbeckius (*De anima sensitiva in genere*). Only Lerbeckius in his *Disputatio philosophica de sensibus internis* uses some authors that are not present in Ulfsbeckius. His disputation, however, concentrates mostly on interior senses (using the tripartite division of *memoria*, *phantasia*, and *sensus communis*). Thus mostly the work of

Ulfsbeckius is considered exemplary regarding the presentation of the Aristotelian worldview about sense perception in *Academia Gustaviana*.

The ideas of Descartes are presented systematically and thoroughly by Andreas Westerman in his disputation, *De erroribus sensuum* (About sense errors) written under Gabriel Sjöberg. This work originates already from the second period of the Academia in Tartu (*Academia Gustavo-Carolina*) and is the longest of the disputations discussed here. He is not credited as the author on the title page, but in the end of the preface he designates himself as A&R (*auctor et respondens*) of the disputation, thus indicating that the text is written by him and not by the presiding professor. Westerman had begun his studies in 1684 in Uppsala and was matriculated into *Academia Gustavo-Carolina* in 1690.¹⁰

Table 3. The literature cited in the disputation of Andreas Westerman *De erroribus sensuum*

| Author | Work cited | Notes |
|--------------------------|--|---|
| Gerardus Joannes Vossius | <i>Etymologicon linguae Latinae</i> | † 1649, Dutch classical philologist and theologian (<i>Tartu Ülikooli ajalugu, I, 202</i>) |
| Christian Becmann | <i>Christiani Becmani Bornensis de originibus latinae linguae; quibus passim alia multa, philologiae propria, pro meliori vocum ac rerum cognitione, inserta</i> | † 1648, German theologian |
| René Descartes | <i>Principia philosophiae</i> | † 1650, French philosopher, dies in Sweden (<i>Tartu Ülikooli ajalugu, I, passim</i>) |
| Antoine Le Grand | <i>Institutio philosophiae secundum principia Renati Descartes</i> | † 1699, French Cartesian philosopher, Franciscan (récollet) |
| Pierre Poiret | <i>Cogitationum rationalium de Deo, Anima, et malo libri quatuor</i> | † 1719, French mystic and Cartesian philosopher, publishes in Holland, biographer of Antoinette Bourignon, with quietist influences |
| Jacques Rohault | <i>Tractatus physicus</i> | † 1672, French philosopher and physicist, popularizer of Cartesianism (<i>Tartu Ülikooli ajalugu, I, 251a</i>) |

¹⁰ *Album academicum der Universität Dorpat*, no. 1193 (309).

| Author | Work cited | Notes |
|---------------------------|--|---|
| Johann Rhegenius Clauberg | <i>Johannis Claubergii physica contracta in qua tota rerum universitas per clara & certa principia succincte & dilucide explicatur</i> | † 1665, German theologian and Cartesian philosopher, active in Duisburg |

The disputations of Ulfsbeckius and Westerman are mentioned a couple of times in the literature,¹¹ but I have been unable to find any at-length studies dealing with the subject of the senses in seventeenth-century Tartu.¹²

*There is nothing in the intellect which was not first in the senses*¹³

The authors discussed here have very different attitudes towards this thesis. Ulfsbeckius understands it as a proposition not needing further proof and first mentions it in his introductory remarks as a basis for his discussion. Westerman, on the other hand, states in the middle of his disputation (thesis XX) that one of his goals is to show that such understanding is not correct, and thus in the last theses (XXV–XXVI) he arrives at the planned conclusions. Such difference mirrors well the opposing philosophical foundations upon which Ulfsbeckius and Westerman build their argumentation. While Ulfsbeckius relies on Aristotle and his commentators, Westerman (using Descartes and his commentators as main authorities) presents a Platonic-Augustinian understanding of the world.

The main argument of Ulfsbeckius is that the sensitive soul (*anima sentiens*) is the form (*έντελέχεια* or *forma*) of a being and it has three distinct faculties. The first he mentions – relying on Jacopo Zabarella – is cognition (*facultas cognoscitiva*), which uses internal and external senses.¹⁴ Though Ulfsbeckius deals in his disputation mainly with external senses (sight, hearing, smell, touch, and taste), there is implicitly also indicated

¹¹ Tartu Ülikooli ajalugu 1632–1982, I, 220, 232; *Descartes ja tema ideede jõudmine Baltimaile*.

¹² However, some of the copies of the disputations I have used carry reading marks in their margins, indicating that someone has studied them not long ago.

¹³ *Nihil est in intellectu quin prius fuerit in sensu*. This quotation has been commonly attributed to Aristotle since medieval times, but actually originates from Thomas Aquinas' *Quaestiones disputatae de veritate* (q 2, a 3, a 18). See also Neal Wood, "Tabula Rasa, Social Environmentalism, and the 'English Paradigm'", *Journal of the History of Ideas*, 53:4 (1992), 651.

¹⁴ Ulfsbeckius mentions also the *facultas appetitiva* and *facultas motrix*. *De anima sensitiva in genere*, sec. I, thes. 6.

the theory of interior senses, which is the main subject of *studiosus* Lerbeckius in his 1639 disputation, *About interior senses*. He deals in his work with common sense (*sensus communis*), fantasy (*phantasia*), and memory (*memoria*). Through five exterior senses and later through three interior senses, we receive all the information about the world and it is brought into the sensitive soul. Thus the sensitive soul is also present in animals and – according to some authors like Gerolamo Cardano – even in plants.¹⁵

On the other hand, according to Cartesian understanding of the soul, there are no possibilities to assign a soul to animals (and certainly not to plants). So within the Cartesian framework, animals and plants are considered automates who respond to external stimuli (*animalia mere automatica*).¹⁶ The Cartesian soul (*res cogitans*), what animals lack and is present only in humans, is similar to the concept of *nous* of Plotinos and to Augustine's understanding of soul. This *ego cogito* or *nous* is the immaterial human soul, which partakes in the immaterial, perfect, and all-encompassing *nous*, which in itself is nothing other than God, through whom and because of whom any truth becomes possible.¹⁷

In other words, while the Aristotelian worldview presents the (human) mind as a *tabula rasa*, initially empty and featureless but upon which something can be written,¹⁸ then the Cartesian view is that all humans are already in possession of eternal truths but the mind is too occupied with external sense data or does simply not pay enough attention to them. Thus one of the main goals of the *Meditations* of Descartes is to draw the mind away from the senses.¹⁹ In light of such observations, it is easily understandable why the senses lead us to error, and only by contemplating through intellect and recognizing only clear and distinct intuitions are we able to gain some true understanding about the world.

Taking such starting points, the authors have very different attitudes towards senses. Ulfsbeckius takes them to be the sources of all knowledge about the world and describes them systematically beginning from the

¹⁵ *De anima sensitiva in genere*, sec. I, thes. 4.

¹⁶ *De sensibus brutorum*, 2.

¹⁷ Menn, *Descartes and Augustine*, 262ff.

¹⁸ "Oportet autem sic sicut in tabula nichil est actu scriptum, quod quidem accidit in intellectu", *Guillelmus de Morbeka reuisor translationis Aristotelis secundum Aquinatis librum – De anima*, liber: 3, cap.: 4 [S. Thomae de Aquino *Opera omnia*, tom. XLV, 1: *Sententia libri de anima*, (Roma: Commissio Leonina, 1984) [A.L. XII.2]]. The later ideas of John Locke about *tabula rasa* are definitely influenced by such Aristotelian understanding. See Wood, "Tabula Rasa", 651ff.

¹⁹ Descartes describes this in his synopsis to the first meditation (*viamque facillimam sternat ad mentem a sensibus abducendam*), AT VII 12.

noblest (seeing) and concluding with the lowest (touch). Westerman, on the other hand, is not interested in the description of the senses but of the various errors they produce, and thus his disputation is in great part an engaging and interesting description of different sense lapses and their reasons.

What makes perception possible?

The decisive differences between the Aristotelian and Cartesian understanding of perception arise from the question of what makes perception possible. According to the medieval Aristotelian theory of perception all things are perceived through their *species*, which reach our sense organs. What the nature of *species* is exactly was the subject of intense debates already in the medieval period. Also, adding to the confusion, later authors (including Westerman) tend to understand *species* in a way that is suitable for them and not always in accord with the Aristotelian concept.

The *species*, as it was understood by many medieval and most early modern Aristotelian authors, can be described as a unit of perception. In the spirit of early modern disputations, which stated that the knowledge or etymology of the word often makes us more aware of the content,²⁰ it is important to see the connection between *species* and visual representation. In a way it is possible to understand it as a synonym of *forma*. This terminological vagueness arose probably from the situation where the Greek words εἶδος and μορφή were translated by different medieval translators of Aristotle without any definite system as either *species* or *forma*.²¹

The word εἶδος is already used by Homer and also Presocratics (Empedocles, Democritus) who applied this word when meaning ‘that which is seen’, ‘appearance’, or ‘shape’.²² Later the word was not so much used to denote outward appearance, but ‘nature’ or ‘constitution.’ Such is also the etymological background of the Latin word ‘species’ – what was used to denote ‘contour’ or ‘appearance’ from as early as by Plautus but at the time of Cicero was already similar in meaning to the Greek ἰδέα.²³

²⁰ “Cognitio quippe verborum multum saepe facit ad notitiam rerum hauriendam”, *De erroribus sensuum*, thes. I.

²¹ Leen Spruit, *Species intelligibilis, 2: from perception to knowledge. Renaissance controversies, later scholasticism, and the elimination of the intelligible species in modern philosophy*, Brill’s studies in intellectual history, 49 (Leiden: Brill, 1995), 101ff.

²² Henry George Liddell, Robert Scott, *An Intermediate Greek-English Lexicon*, εἶδος.

²³ “Hanc illi ἰδέαν appellabant [...] nos recte speciem possumus dicere”, Cicero, *Academica*, I.30. Charlton T. Lewis & Charles Short, *A Latin dictionary* (Oxford: Clarendon Press, 1879), species.

Thus *eidos* became by Aristotle (*De anima*) the soul or form or the complete reality of the body (Aristotle uses the words εἶδος, μορφή, and ἐντελέχεια, which were all understood by Ulfbeckius to be synonyms²⁴). Such an understanding of the soul was enthusiastically adopted when Greek philosophy became once again available to Western authors after nearly half a millennium. The most notable and influential of Latin authors was by far Thomas Aquinas. In spite of some initial resistance to such a theological understanding of the human body and soul²⁵ – ideas that were mostly conveyed through Islamic texts and translations – the Aristotelian philosophical view was nearly universally adopted during the fourteenth century. The fact that Thomas Aquinas was pronounced a saint in 1323 and later *doctor ecclesiae* (1567) was of course an indicator and at the same time propagator of that philosophical attitude. It was deemed common knowledge that a human being is an unseparable unification of soul (*species, forma*) and body. The example that Aristotle uses and Thomas Aquinas comments on is such:

[...] there is no more reason to ask whether soul and body together make one thing than to ask the same about wax and the impression sealed on it, or about any other matter and its form. For, as is shown in the *Metaphysics*, Book VIII, form is directly related to matter as the actuality of matter; once matter actually *is* it is *informed*. [...] Therefore, just as the body gets its being from the soul, as from its form, so too it makes a unity with this soul to which it is immediately related.²⁶

Sense perception in the Aristotelian framework occurs when the actuality of a thing reaches us from the exterior world – through its *species* that

²⁴ *De anim. sens.* sec. 1, thes. 3.

²⁵ See *Nach der Verurteilung von 1277: Philosophie und Theologie an der Universität von Paris im letzten Viertel des 13. Jahrhunderts. Studien und Texte = After the condemnation of 1277: philosophy and theology at the University of Paris in the last quarter of the thirteenth century. Studies and texts*, ed. by Jan Aertsen, Kent Emery & Andreas Speer, *Miscellanea mediaevalia*, 28 (Berlin: De Gruyter, 2000).

²⁶ Aristotle and Thomas Aquinas, *Aristotle's De anima*, trans. by Kenelm Foster and Silvester Humphries, *Rare masterpieces of philosophy and science* (London: Routledge and Kegan Paul, 1959), 172. “Et hoc est quod dicit quod non oportet quaerere si ex anima et corpore fit unum, sicut nec dubitatur circa ceram et figuram, neque omnino circa aliquam materiam et formam, cuius est materia. Ostensum est enim in octavo metaphysicae quod forma per se unitur materiae, sicut actus eius; et idem est materiam uniri formae, quod materiam esse in actu. [...] Et ideo sicut corpus habet esse per animam, sicut per formam, ita et unitur animae immediate, in quantum anima est forma corporis”, Thomas de Aquino, *In Aristotelis libros De anima II et III*, liber: 2, lectio: 1, numerus: 234.

is received by senses and transmitted to the brain by nerves.²⁷ It is important to stress that the intelligible *species* is not to be confused with the platonic idea – *species* is always a representation of a thing and only after the cognoscitive power operates we are brought to some understanding of the object.²⁸ The problematic question is in which way the *species* of a thing reaches us. Here it is reasonable to lay out two different opinions which vary in stress on the operational qualities of the *species*: (1) the *species* is intentional and thus more of a psychological object; (2) the *species* is moving through a medium, mechanistically multiplying itself. It is possible to see the different viewpoints on the ontological status of the *species*. In the first case, human attention is stressed and only through cooperation with the intellect the understanding of the object is achieved – the understanding which is represented by the concept of spiritual *species*.²⁹ The second position sees *species* more as active in itself and stresses that all objects emit its *species* in all directions and imprint the sensitive soul as a stamp imprints its form onto wax. Thus it is also possible to see two perspectives that bring, in one case, the active (psychological) side of the intellect into the foreground and, in the other case, its passive side and stress the mechanistic and perspectivist understanding of the propagation of *species*.³⁰

The most well known and even canonical representative of the first position is considered to be Thomas Aquinas,³¹ while the second position is represented by perspectivists such as Roger Bacon.³² This later perspectivist

²⁷ “Hoc etiam objectum ad sensationem confere ut facultatem ipsam de potentia in actum traducat, imprimendo suam speciem, quae alias spiritalis item intentionalis dicitur”, *De an. sen.* sec. 1, thes. 13. “Cerebrum esse primum sensorium”, *De an. sen.* sec. 1, thes. 20.

²⁸ “Sed beneficio spiritalis speciei Reale objectum repraesentantis, sese in sensorium insinuat, atque potentiam sensitivam, ad actum sentiendi eliciendum exitat”, *De sensibus in genere, et de auditu in specie*, thes. 14.

²⁹ “Quod sensibile in sensorium agat spiritualiter, scilicet emittendo speciem spiritalem”, *De an. sen.* sec. 1, thes. 15.

³⁰ “Nam sensus ad duo potest referri: 1) Quando ad speciem sensibilem referretur, sensus est in *potentia passiva*, quia illae species recipiuntur in sensu & recipere est pati. [...] 2) Quando referretur ad actum sentiendi, est in *potentia activa*, quia illum profert ac producit”, *De an. sen.* sec. 1, thes. 16.

³¹ Leen Spruit, *Species intelligibilis, 1: classical roots and Medieval discussions*, Brill’s studies in intellectual history, 48 (Leiden: Brill, 1994), 156ff.

³² Roger Bacon, *Roger Bacon and the origins of Perspectiva in the Middle Ages: a critical edition and English translation of Bacon’s Perspectiva, with introduction and notes*, ed. & trans. by David Lindberg (Oxford; New York: Clarendon Press; Oxford University Press, 1996), lxxviii ff. David Lindberg, *Theories of vision from al-Kindi to Kepler* (Chicago: University of Chicago Press, 1976), 113–114.

theory is the one that influenced Descartes and upon which his theories of vision and light are a great deal dependent.³³

Still, both positions are in agreement on the issue that sense perception and cognition are essentially connected, if we bear in mind the proposition that “there is nothing in the intellect which was not first in the senses”. Through *species* we receive the properties of things that can be perceived by several senses as is the case with motion, stillness, shape, number, and magnitude,³⁴ or are only specific to some sense as color is to the eye, what ear does not hear, as well as eye does not perceive sound.³⁵ All these perceptions are processed through common sense, which is located in the heart according to Aristotle, or in the brain according to Galenos.³⁶ Ulfbeckius here accepts both positions and says that *secundum radicationem*, or common sense, originates from the heart, but *secundum operationem*, or operationally, from the brain, for it is the brain to which is connected to the nerves from different sense organs.

Westerman presents in his disputation a very different view and states that all perception is just local movement³⁷ and we can abandon qualities and *species* altogether. This can also be viewed as a logical next step of the perspectivistic theory of vision and perception. Thus light is nothing more the movement of small particles of aether, sound is the stroked or percussed air that moves the tympanic membrane, pain is anything that induces vehement motion in our bodies. It can be concluded that sensation takes place when something material agitates our senses, but these material particles do not carry or represent real qualities.³⁸ This is explained by this citation from Descartes:

³³ A. Mark Smith, *Descartes's theory of light and refraction: a discourse on method* (Philadelphia: American Philosophical Society, 1987), 8ff.

³⁴ “Motus, quies, figura, numerus & magnitudo”, *De an. sen.* sec. 1, thes. 18.

³⁵ “Color [...] non enim auditur ab aure, nec sonus videtur ab oculo”, *De an. sen.* sec. 1, thes. 18. Emzelius in his *De auditu*, thes. 13 list here “color, sonus, odor, sapor & qualitates tactiles”.

³⁶ “Organon hoc est vel *Commune* vel *proprium*. De illo variae apud antiquos extiterunt sententiae. Quidam statuunt illud esse *in corde* ut Aristoteles, quidam in *Cerebro* ut Galenus”, *De an. sen.* sec. 1, thes. 20.

³⁷ “Quid ab objectis in organa sensoria agat? Hoc ipsum motum esse locale”, *De. err. sens.* thes. IV.

³⁸ “Nec concipiamus aliud quidquam a sensuum externorum organis ad cerebrum nostrum transire, praeter ejusmodi motum. Si enim descendere velimus ad qualitates sive species vulgo sensibiles dictas, inveniemus omnes per illum clarissime explicari posse. Nam quid est lumen, nisi motus substantiae aetheriae, sive globulorum aetheriorum, ex vehementi agitatione materiae subtilis originem ducens. Quid sonus, nisi ictus & percussus aer, qui tympanum, auditus organum movet. Quid dolor, nisi motus aliquis

And we see that this local motion produces not only sensations of pain and pleasure but also those of light and sound. If someone is struck in the eye, so that the vibration of the blow reaches the retina, this will cause him to see many sparks of flashing light, yet the light is not outside his eye. And if someone puts a finger in his ear he will hear a throbbing hum which comes simply from the movement of air trapped in the ear.³⁹

Westerman comments that when hitting the eye, coarser matter (*viz* air) escapes and finer matter (*viz* light and aether) enters.⁴⁰ Here we can recognize the Cartesian distinction of different types of matter, of which (1) the most subtle one is aether and the light particles that fill the whole room, (2) coarser particles of what different fluids are composed (air is also considered a type of liquid), and finally (3) the bulkiest particles that compose solid bodies. In essence all those particles are the same, with differences occurring only in size.⁴¹ How these particles behave is exemplified by Westerman with a classic description of lightning and thunder:

Thus follows that thunder and lightning happen about the same time, but in spite of that we see lightning before we hear the thunder. Because of the fine aether our sense of sight is first agitated, but the thunder, what originates from the collision of clouds, must pass through the coarser air to be able to bring sound to our ears.⁴²

It follows that our sense organs do not receive any other information from the world besides those particles, which due to their properties do not carry any other information than the direction of their motion (indicating the extension of the object), their size, velocity, and spin. Qualities such as colors, tastes, and smells reach us due to the different motion of the particles, which gain different spin and velocity due to the properties of the

vehementior in membra nostra agens [...] Concludere itaque licet, omnem sensum ex contactu mutuo partium, quae localiter in nobis moventur, fieri”, *De. err. sens. thes. IV*.³⁹ *Principia philosophiae*, 4.198, René Descartes, *The philosophical writings of Descartes. Vol.1*, trans. by John Cottingham, Robert Stoothoff, and Dugald Murdoch (Cambridge: Cambridge University Press, 1985), 284 [AT VIII A 322].

⁴⁰ “Causa vibrationis illius in oculo facile dari potest, quod scilicet expellatur materia crassior, nempe aër, & influat materia subtilis, quae tunicas movet, cujus deinde agitationis mens conscia fit”, *De. err. sens. thes. IV*.

⁴¹ *Le Monde*, 4, Descartes, *The philosophical writings of Descartes*, 1, 85 [AT XI 17].

⁴² “Unde patet tonitru & fulgur eodem fere momento fieri, nihilominus fulgur prius videmus, ob subtilem aethera, qui prius visum nostrum movere, quam fragor ex concursu nubium oriens, crassum aera penetrare, sonumque ad aures nostras derivare queat”, *De. err. sens. thes. XIII*.

surfaces they bounce off. These motions we perceive as tastes, smells, or colors – qualities that as such do not exist outside our cognition.⁴³

Presenting such a mechanistic theory of perception, Westerman also criticizes some understanding of *species*. He maintains that (1) *species* cannot be a body (*corpus*), (2) *species* cannot be an immaterial entity (*spiritus*), and (3) *species* can not be equalled with ideas (*similes esse ideis*).

The first is impossible as it is altogether unclear how such *species* are produced by bodies, how they are emitted, and how our sense organs receive and transfer them to our brains.⁴⁴ Against the possibility that the *species* are similar to Platonic ideas, Westerman argues – quite correctly – that if there were Platonic ideas emitting from bodies then everybody would understand the things in exactly the same way and sense errors would be impossible, which is a completely mistaken position as experience proves more than sufficiently.⁴⁵

It can be also argued that words bring to our mind different things, but those words are not at all similar to the things, situations, and persons they remind us of.⁴⁶ This is of course a (willfully?) mistaken understanding of the *species* theory, but wholly consistent with the Cartesian theory of perception which states that contrary to *species* we are perceiving only the motion of particles that are brought to the pineal gland, the primary link between body and soul.⁴⁷ In the pineal gland, the motion of particles stirs the soul to bring up different ideas.⁴⁸ We see here quite clearly that the material we receive from the outside world is in itself quite poor in information, and only in the interpretation of different motions do we gain some content. According to this it is possible to separate the reception of some basic characteristics of a thing, which is the work of different sense

⁴³ “Constitutum enim qualitates gustabiles in certa dispositione corporis sapidi, secundum magnitudinem, figuram situm, motum et mensuram partium; pro quorum diversitate diversae saporum species exsurgunt”, *De err. sens.* thes. XIII.

⁴⁴ “Videre enim nequimus, quomodo tales imagines ab objectis provenire possunt, aut qua vi objecta illas producant & quomodo tandem organa sensoria illas recipiant & ad cerebrum deferant”, *De. err. sens.* thes. V.

⁴⁵ “Hoc enim si forent, ab uno eodemque objecto semper unius generis species emitti debeant, quas uniformiter omnes perciperent, quod falsum esse, quotidiana experientia, infallibilis illa rerum magistra, satis superque docet”, *De. err. sens.* thes. VI.

⁴⁶ “Vel quamnam convenientiam habent verba, signa illa arbitraria, sive ore prolata, sive scripto consignata fuerint, cum rebus, quas denotant”, *De. err. sens.* thes. VI.

⁴⁷ “Omnes enim nervi, quorum ope mens conscia fit rerum externarum, ad cerebrum sive glandulam, prope fontem spirituum animalium, positam, coeunt, ut fibrae nervorum, in eis undique agere queant”, *De. err. sens.* thes. VII.

⁴⁸ “Nam ea animae nostrae est natura, ut diversi motus locales sufficiant ad diversas in illa ideas excitandas”, *De. err. sens.* thes. VII.

organs, and the perception of it as something, which is purely an act of the mind. In support of such differentiation, it is possible to show that people who have suffered a stroke or otherwise have brain damage may not have the capacity to sense certain body parts anymore and may be unaware of inflicted pain – in other words, perceiving pain is purely a mental act.⁴⁹

Here the author makes an important comment about the trustworthiness of senses – that the senses are never wrong because they receive and transmit information. Error takes place only in the mind, when we make an erroneous decision based on the sense data. This leads also to the understanding that things and the ideas of them are very different, even so that:

It is more reasonable to draw an analogy or comparison between colors and sounds than between corporeal things and their sensible ideas and God.⁵⁰

In this respect we should be suspicious towards sense data – it is very easy to arrive at wrong conclusions relying primarily on perception. This is the reason behind applying methodological doubt to the sciences. This does not mean that true understanding of things outside our mind is impossible, but we ought to be cautious not to let the senses dominate. This is possible due to the fact that our minds are somewhat similar to God's, or as Descartes puts it:

For I readily and freely confess that the idea which we have of the divine intellect, for example, does not differ from that which we have of our own intellect, except in so far as the idea of an infinite number differs from the idea of a number raised to the second or fourth power. And the same applies to the individual attributes of God of which we recognize some trace in ourselves.⁵¹

Foremost, such similarity means that we are in a way participants of the objective reality which is in other words the eternal truth that is proceeding from God.⁵² Descartes does not imply that we have those truths in us

⁴⁹ "Perceptionem sic in cerebro peractam, alius quidam mentis actus sequitur, qui conclusionem fert, res tales esse, quales idea de illis formata, exhibet. Est que hic actus mere mentalis", *De. err. sens.* thes. VII.

⁵⁰ "Analogie sive paritatis fingi potest inter colores & sonos quam inter res corporeas vel earum sensibiles ideas & Deum. P. Poire. Cogit. Rat". The passage is slightly different in Descartes second reply to the second objection [AT VII 136].

⁵¹ René Descartes, *The philosophical writings of Descartes. Vol.2.*, trans. John Cottingham, Robert Stoothoff, and Dugald Murdoch (Cambridge: Cambridge University Press, 1985), 98 [2 reply to the 2 objection] [AT VII 137].

⁵² Menn, *Descartes and Augustine*, 276.

already fully formed, but he insists that as we have the possibility to reach the truth and as the intelligible world (or the ideal world) is the only real one, then all bodily objects are understandable and furthermore existent through ideas.⁵³ To illustrate this, Westerman brings an example from the second meditation of Descartes:

As we are seeing (to use the words of Descartes) somebody passing by in the street below, we are saying that these are humans and yet we do not see beyond hats and cloaks that might cover artificial machines.⁵⁴

He of course adds the famous example about a piece of wax that can change almost all its properties, but intellectually we can be certain that this is still the same piece of wax.⁵⁵ Later Westerman demonstrates thoroughly with different examples that there is much more that we grasp very clearly with the intellect but have only vague or erroneous sense data about the same things – not only due to the fact that our senses are often inadequate to receive the information and are weaker than those of most animals. Furthermore we are able to understand things that are not visible at all or too far away. Thus it follows that we have some access to eternal ideas – the mind penetrates the nature of things, while senses discern only the exterior of things.⁵⁶

Having thus demonstrated what perception is and how it occurs, both authors move on to describe specific senses. For both Ulfbeckius and Westerman, the first sense to be described is seeing, but for very different reasons. Ulfbeckius holds seeing important (like Aristotle) as “in this sense object, organ and the medium between them are clearer than in other senses. It follows that vision is nobler than other senses and thus the first”.⁵⁷

Ulfbeckius briefly discusses whether seeing takes place as extramission (as Platonics) or intromission (as Aristotelians) or as a combined intro- and extramission (as Galenos).⁵⁸ He reaches the conclusion that only the theory

⁵³ Menn, *Descartes and Augustine*, 357–358.

⁵⁴ “Sic cum videamus (ut Cartesii verba faciam mea) ex fenestra aliquem praetereuntem in platea, dicimus hominem praetereire, cum nihil praeter pileos & vestes, sub quibus automa [!] quoddam latere potest, videamus”, *De. err. sens.* thes. XI.

⁵⁵ *De. err. sens.* thes. XI.

⁵⁶ “Illa est, quae intimam rerum essentiam penetrat, cum sensus exteriora saltim delibent”, *De err. sens.* thes. XXV.

⁵⁷ “Quia in hoc sensu objecta, organa & media magis perspicua sunt, quam in reliquis sensibus. Ergo visus ceateris est nobilior, atque praemittitur”, *De an. sen.* sec. 2, thes. 4.

⁵⁸ *De an. sen.* sec. 2, thes. 6. Ulfbeckius does not name here Galenos by name but Lerbeckius in his work (*De sensibus in genere et in specie de externis*, thes. 21) identifies Galenos as the author of such combined theory. Regarding Galenos’s theory see Lindberg, *Theories of vision*, 38.

of intromission is correct. This theory holds that a sense organ, colored object, transparent medium, and light to illuminate the object are necessary for seeing. Having given a short overview of the subjects mentioned, Ulfsbeckius moves on to describe the composition of the eye and nerves and touches also upon the Aristotelian theory of color perception, indicating that color is the visible quality that appears at the very extremes of an object.⁵⁹ Light is needed to actualize the color in the transparent medium, as without it color exists on the extremes of an object only potentially.⁶⁰ Thus a white object is white when it is in full light and not visible when there is no light as the colors are unable to actualize.

Westerman places seeing in his disputation as the first sense under discussion, but for the reason that as there are more things discernible through sight than the other senses, and so through sight we err the most.⁶¹ Westerman is not interested in the ancient theories of vision and is assuming the intromission theory. Also, the composition of the eye is for him of no notable importance. He rather starts off by introducing promptly the Cartesian theory about colors. He denies that colours are somehow existent in light. This is also the case with Aristotelian theory of colors, but the thing that differs from the Aristotelian view is that different colors are mediated to us through the different speeds of the particles that reach us from objects.⁶² The different characteristics of materials cause the particles to spin differently and this is interpreted by us as colors – i.e. colors are ideas that have no real existence outside the intellectual sphere.

To corroborate such a conclusion, Westerman draws attention – with a well-known example from Rohault – to the fact that when a sense organ is somehow injured it may very well be that this injury alters our sense perception:

However I would not doubt to affirm that just as it often happens that the same food at the same time raises quite different tastes in two different persons, similarly it can be that two men have very different sensations when looking at the same object; in such things I am the more convinced because I have an singular personal experience of it. For it

⁵⁹ “Color sit qualitas appares in extrema superficie corporis terminati”, *De an. sen.* sec. 2, thes. 12.

⁶⁰ Arist. *De anima*, 2.7.

⁶¹ “Cum enim plura objecta oculus subjiciantur, quam reliquis sensibus, igitur hic variis, prae reliquis, est obnoxius erroribus”, *De err. sens.* thes. XII.

⁶² According to Cartesian theory, light is a “movement or action, very rapid and very lively, which passes toward our eyes through the medium of the air and other transparent bodies”. Smith, *Descartes’s theory of light and refraction*, 13.

happened once that my right eye was weakened and injured, by looking for more than twelve hours through a telescope (ope conspicilliorum Batavicornum) at a naval battle that was going on a mile and a half away; I now find my vision so affected that when I look at yellow objects with my right eye, they do not appear to me as they used to, nor as they now appear when I observe them with the left. And what is remarkable is that I do not notice the same variation in all colors I deliberate, but only in some, such as green, for example, which appears close to blue when I observe it with the right eye. This experience of mine makes me believe that there are perhaps some men who are born with, and retain all their life, the disposition that I currently have in one of my eyes and that there perhaps are others who have the disposition that I enjoy in the other.⁶³

It would be possible to interpret this example differently and find no support for the idea that colors are something other than sensible qualities. Even the supporters of the Aristotelian theory of vision would agree that when a sense organ is injured the perception is altered. This similarity is also reflected in the concluding remarks of thesis XII of Westerman's disputation: "because of differences in sense organs, objects and the medium between them erroneous perceptions about color oftentimes happen".⁶⁴ This reflects very closely the conditions that must be met for correct vision by Ulfsbeckius (see above). Sense errors were not an unknown subject for those who favored the *species* theory, and thus we find the greater part of the examples presented by Westerman already presented by Roger Bacon,

⁶³ "Id tamen asserere non dubitabo, ut saepe contingit eundem cibum eodem tempore in duobus diversis hominibus, varios sapes referre; ita quoque fieri posse, ut duo homines valde dissentiant circa iudicium de eodem visus objecto: Eoque magis rei securus sum, quod de re mihi constet per experientiam omnino singularem: cum enim aliquando mihi contigisset, ut a diuturno conspectu, ultra duodecim horas protracto, ope conspicilliorum Batavicornum, pugnae navalis, procul a me sesquimiliaris spatio commissae, oculus dexter fatigatus et & offensus fuisset, eo jam in statu visum meum constitutum deprehendo, ut si *flava* objecta conspiciam oculo dextro, non ut ante, talia mihi appareant, nec qualia oculo sinistro repraesentantur. Et quod mirum est, non eandem varietatem in omnibus coloribus a me animadverti, sed solum in quibusdam, ut, exempli gratia, in viridi, qui mihi accedere videtur ad caeruleum, si intueor oculo dextro. Experientia ea facit ut credam, quosdam homines nasci ea dispositione perenni praeditos, quae nunc oculorum meorum uni infixae est, ac forte aliis adesse eadem, quae alteri meo oculo inest", Jacques Rohault, *Tractatus physicus* (Amsterdam: Apud Johannem Pauli, 1691), 1.27.6, 178. See also Jacques Rohault, *Rohault's system of natural philosophy, illustrated with Dr. Samuel Clarke's notes taken mostly out of Sir Isaac Newton's Philosophy*, I (London: James & Knapton, 1735), 197.

⁶⁴ "Hinc est, quod pro frequenti tam organorum, quam objectorum & medii varietate, erroneae de coloribus ferri soleant conclusiones", *De err. sens.* thes. XII.

Peter of Limoges, or Claudius Coelestinus.⁶⁵ Thus it can be argued that the main difference between the Cartesian and Aristotelian understanding of colors can be understood as the difference between the physical and psychological understanding of seeing.

Moving on from colors, Westerman discusses more illusions and errors and also different natural phenomena. Mostly he does this in order to present the Cartesian worldview, but sometimes also to add other explanations that have very little to do with Cartesian philosophy. One of the most interesting ones is of course the so-called moon illusion. Here Westerman presents the physiological explanation for such an event, relying on Johannes Claubergius. He states that the illusion happens when the moon or the sun are close to the horizon, and other objects like trees or hills are being also in the line of sight. Due to the proximity of other objects, our pupil contracts itself and thus the sun seems larger.⁶⁶ This explanation derives a bit from the Cartesian explanation, for Descartes explained the moon illusion as our mind interpreting the distance and calculating the size of the object, ie. psychologically. Already in the thirteenth century the moon illusion was usually explained in this way (the main source of this being Alhacen), and in the seventeenth century it was also the most common explanation. Popular but incorrect explanations of the illusion included refraction of the atmosphere and also atmospheric haze, which makes the objects fainter and thus interpreted as larger and further away.⁶⁷

Westerman also discusses the stars and argues against the already very outdated Ptolemaian worldview that it would be erroneous to think that sky is somehow similar to a painted vault. Visible stars can be even greater than the sun and seem small only due to their vast remoteness. Their different brightness that is discussed already by ancient authors is explained by their different distances from us.⁶⁸

Some described errors no doubt also derive from Westerman's own experience and observations, like the fact that Estonian and Finnish people

⁶⁵ Bacon, *Perspectiva*; Meelis Friedenthal, *Tallinna Linnaarhiivi Tractatus moralis de Oculo*, Dissertationes theologiae Universitatis Tartuensis 13 (Tartu: Tartu Ülikooli Kirjastus, 2008); Claudius Coelestinus, *De his que mundo mirabiliter eveniunt: ubi de sensuum erroribus et potentiis anime, ac de influentiis caelorum* (Paris: Apud Simonem Colinaeum, 1542).

⁶⁶ "Corpora namque quo viciniora nobis sunt, eo magis coarctatur pupilla oculi", *De err. sens. thes. XIV*

⁶⁷ Frances Egan, "The moon illusion", *Philosophy of Science*, 65:4 (December 1998), 604–623.

⁶⁸ *De err. sens. thes. XV*.

are somehow more capable of enduring the heat of a sauna,⁶⁹ or the fact that some people are unable to remain in a room with a cat. The last one is very likely a description of an allergy towards cats, and Westerman thinks that the probable culprit for such an intolerance is the smell of the cat. The reason for such a reaction is that people have been unknowingly injured by a cat when they were infants or a cat perhaps injured the mother when she was pregnant.⁷⁰

Concluding remarks

The disputations originating from the *Academia Gustaviana* and *Academia Gustavo-Carolina* dealing with the sense organs and perception label their subject matter in different ways. In three cases it is deemed a philosophical subject (*disputatio philosophica*), in three cases the subject area of physics (*disputatio physica*), and in one case a subject of psychology (*disputatio psychologica*). Nowhere in their prefaces or text do the authors give any explanations for such categorizing and indeed seem to use those words almost synonymously. This is somewhat departing from the Aristotelian philosophical tradition where the soul was usually considered within the area of physics.⁷¹ We can only speculate here that the choice of wording in naming the disputation could be influenced by the area of expertise of the presiding professor. In the cases of labeling the disputation *physica*, the presiding professor is in two cases of physics (Erici Stregensis) and in one case of eloquence and poesy (Dau). Professors of philosophy (Savonius, Sjöberg) and of astronomy and physics (Schomerus) were presiding over philosophical disputations. The one psychological disputation was presided over by the second professor of theology who was also professor of physics and arithmetics. This assumption that presiding professors influenced the choice of labeling the disputation is not corroborated by the fact that the only other disputation in Tartu during the seventeenth century described a psychological (*Disputatio psychologica de anima in genere* by

⁶⁹ “Sic balnea sufficienti non gaudere calore dicit Fenno vel Livonus, quae alius nationis homo vix ingredi potest”, *De err. sens.* thes. XXIV.

⁷⁰ “Quidam effluvia et odores de fele exeuntes optime tolerant, quos tamen alii ut pessimum quodvis fugiunt, adeo ut in eadem cum fele domo manere nequeant. Hanc autem aversionem inscius quis vel in utero matris, vel in ipsa infantia contraxit, cum aut mater tempore gestationis aut ipse in cunis a fele laesus fuerit, quae idea cerebro tunc impressa continuo manet”, *De err. sens.* thes. XXIII.

⁷¹ Daniel Garber and Michael Ayers, *Cambridge history of 17th-century philosophy* (Cambridge University Press, 2003), 956.

Nicolaus Prytz, 1634) is presided by a professor of philosophy. When looking at other disputations dealing with the subject of the soul, it appears that even under the same professor the disputation could be called either physical or philosophical.

Despite the differences of the titles, the disputations of the *Academia Gustaviana* period are remarkably similar and deal with the senses according to the Aristotelian tradition. There is little or no controversy and most of the problems (e.g., the question of understanding the intelligible *species*) are glossed over. Regardless of that, it is evident that the authors are sufficiently well acquainted with the subject of the senses and perception within the Aristotelian framework. Still, mostly textbook literature and rather general treatments are used and some of the contemporary and more scholarly treatments of the subject of sense perception and anatomy of the sense organs are absent.⁷² As the last work from the period of *Academia Gustaviana* dealt with in this essay is from 1655, it is not very surprising that the new Cartesian ideas had not yet arrived to Tartu. It was still only ten years after the publication of Descartes' *Principia philosophiae* and five years after the author had died in Stockholm.

The works from the second period of the Academia in Tartu (*Academia Gustavo-Carolina*) are quite different in character. Both authors (Westerman and Carstenius) were very well acquainted with the Cartesian worldview, and presented it systematically and polemically against the ideas of the Aristotelian tradition. In these disputations we can see no traces of a fierce opposition to "modern" Cartesian philosophy that was common in the middle of the century in other universities, e.g., in Uppsala.

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⁷² E.g. Alhacen, Johannes Kepler, Felix Platter, Hieronymus Fabricius are nowhere mentioned in connection with senses.

KOKKUVÕTE: *Tajukäsitlused 17. sajandi Academia Gustaviana's ja Gustavo-Carolina's*

Mitmes mõttes on meeltetajud 17. sajandil toimunud filosoofilise pöörde keskmes. Selle otsustamiseks piisab, kui vaadelda Descartes'i esimest meditatsiooni – mida Descartes ei taha seal enam usaldada, on teadmised, mis on saadud mitte mõistuse abil, vaid meeleliselt. Kuigi mediteerija ei ütle seda kusagil otse välja, on siinkohal tegemist eelkõige rünnakuga aristotelismi vastu. Selline erinevus meeltetajudes suhtumisel on jälgitav ka 17. sajandi Tartu ülikooli disputatsioonides. Artiklis käsitletud kaheksa disputatsiooni katavad perioodi alates kaks aastat pärast ülikooli asutamist (1634) kuni selle Tartust Pärnusse üleviimiseni (1699). Väga laias laastus saab need tööd jagada kaheks. Esimesed kuus (aastatest 1634–55) tegelevad aristotelesliku füüsikaga ja viimased kaks (aastatest 1692 ja 1699) võtavad arvesse ka Descartes'i ja teiste moodsamate autorite teooriaid. Kuigi kartesiaanlikku pööret on Eesti kontekstis käsitletud teatavas mõttes skeptitsismi (pürnonismi) väljendusena ning metodoloogilise kahtluse esiplaanile seadjana, siis on siinse töö eesmärgiks näidata, kuidas otsustav erinevus eelnevast aristoteleslikust traditsioonist tuleneb mitte niivõrd metodoloogilisest kahtlusest, kui võrd augustiinlik-platoonilise maailmavaate süstemaatilise taasesitamisest.

Kõige põhjalikumaks aristotelesliku maailmapildi esitajaks on oma ülesehituse süstemaatilise ja allikate kasutamise poolest Magnus Ulfsbeckius disputatsioon *Disputatio inauguralis, de anima sensitiva in genere, et in specie de sensibus exterioribus* (Aistivast hingest üldiselt ja välismeeltest eriti, 1634). Descartes'i ideid esitab põhjalikult ja üsna süstemaatiliselt Andreas Westerman oma dissertatsioonis *Dissertatio philosophica de erroribus sensuum* (Meelepetetest), mis pärineb *Academia Gustavo-Carolina* perioodist (1692).

Mõlemal autoril on töid kirjutades olnud oluliseks alguspunktiks erinev arusaam juba Aristotelesle omistatud teesist, et midagi pole olemas vaimus enne, kui see on meelte poolt tajutud. Ulfsbeckius tajub seda tõestamist mittevajava väitena ning toob selle juba sissejuhatuses välja kui aluse, millele tuginedes edasine töö on kirjutatud. Westerman seevastu seab oma töö keskel eesmärgiks näidata, et nimetatud arusaam ei pea paika ning viimastes teesides jõuabki kokkuvõtlikult planeeritud järeldusele. Selline seisukohtade erinevus peegeldab erinevaid filosoofilisi taustu, millele Ulfsbeckius ja Westerman tuginevad. Kui Ulfsbeckius toetub Aristotelesle ja tema kommentaatoritele, siis Westermani seisukohad on koos Descartes'i

ja tema kommentaatoritega pigem uusplatoonlik-augustinuslikud. Ehk teisisõnu, kui aristoteleslik maailmapilt esitab (inim)vaimu kui *tabula rasat*, millele saab potentsiaalselt kirjutada, aga mis on algselt täiesti tühi, siis kartesiaanlik maailmapilt eeldab, et inimesel on olemas kõik tõesed kaasa-sündinud moel, ta lihtsalt ei pööra nendele piisavalt tähelepanu või on liigselt hõivatud meelteandmetega. Niiviisi meeltetajusid käsitledes on ilmne, et need viivad meid enamasti lihtsalt eksiteele ja vaid vaimus kontempleerides ning vaid neid asjaolusid tunnistades, mida me mõistame selgelt ja täpselt, on võimalik saada tõest informatsiooni maailma kohta. Selliselt tegelevadki käsitletavat autorid meelttega väga erinevalt. Ulfsbeckiuse disputatsioon võtab ette ja kirjeldab neid süstemaatiliselt kui kõigi teadmiste allikaid, alustades kõige üllamast (nägemisest) ja lõpetades kõige madalamaga, mis on omane nii inimestele kui ka taimedele (kompimismeel e. taktilsus). Westerman aga suhtub kõigisse meelteandmetesse kahtlusega ning nii ongi tema disputatsioon suures osas erinevate meeletetete kohati vägagi põnev ja lõbustav kirjeldus.