

# Philosophies of Blindness and Visual Impairment from the Middle Ages Through to the Enlightenment

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# Introduction

- Part of an examination of the evolution of knowledge on blindness and visual impairment in Western epistemology from antiquity through to recent theories
- Shown in comparison to experiences of learning and visual culture
- This presentation has two aims:
  - To link a middle-era of epistemology on blindness with antiquity and current theorisation
  - To show the effects of epistemology on the enlightenment's "education for the blind"
- Epistemological model (Hayhoe 2016) divided into intellectual epistemes, and meta-trends within these epistemes
- The epistemes are:
  - The middle ages episteme
  - The enlightenment episteme

# Three Parts to the Presentation

- The first part examines the notion of blindness and visual impairment in the middle ages (to include the renaissance) a period when the first elements of modern science were developed, and an embryonic science of optics was related to the study of vision
- The second part examines the study of blindness during the enlightenment, which launched a new empirical study of vision and saw blindness and visual impairment in relation to the mind and consciousness
- The third part of the chapter concludes and summarizes this middle point of the Western epistemology of blindness and visual impairment

# The Middle Ages Episteme

Optics and Empiricism, and Blindness of Intellect

# Meta-Trend 1: Optics as Quasi-Empirical Study

- Greek influence on our understanding of blindness and visual impairment
- Euclid's Optics developed an understanding of "rules" of geometry, points, lines and objects (later known as Plato's Objects (Artmann 2012))
- Vision could be used empirically to measure the distance from earth to the planets
- Ibn Al-Haitham born in what is now Iraq around 965 ACE and died around 1040 ACE in Egypt, hypothesised optics as biological (Unal and Elciogla 2009)

"If the body facing ... a colour is in a dark place, then nothing will appear on it on account of its darkness and the darkness of the form cast upon it. But if the body facing this colour is in an illuminated place and there is light on it from something other than that form, and if this body is coloured, then its colour will dominate over that form and will appear to the eye rather than the form. The form, acting like a shadow, will only reduce its colour and the eye will not discern this reduction." (Al-Haytham 1989, P. 95)

# Roger Bacon: Optical Science

- Al-Haitham's work translated into Latin and became known as *Opticae Thesaurus*, Al-Haitham re-named, Alhazen
- Middle period of colonisation of Southern Europe by Islamic Arabs with Jewish scribes influenced Roger Bacon (Heer 1963)
- Bacon attempted to rationalise the senses and interpret human knowledge and wisdom
- Thought vision was the only empirical form of measurement
- Bacon's work influences the Polish philosopher Witelo (*Opthamology*) and it is said Leonardo da Vinci

“[A] blind man can have no experience worthy of the name concerning [natural science and experimentation] ... Hearing causes us to believe because we believe our teachers, but we cannot try out what we learn except through vision. If, moreover, we should adduce taste and touch and smell, we assume a knowledge belonging to beasts.” (Bacon 1962, P. 419)

# Da Vinci on Blindness: Vision, Blindness and Body

- 300 years after Bacon, da Vinci theorized that human senses control and guide the soul (Keele 1983)
- His treatise, *How the Five Senses are the Ministers of the Soul*, imagined a soul set in the same region as the “*seat of judgment*” (1955)
- da Vinci presented consciousness as a mixture of separate senses mixing spiritual and scientific, soul, muscle and tendon, as well as the brain / mind
  - Termed the “common sense”

“So therefore the articulation of the bones obeys the nerve, and the nerve the muscle, and the muscle the tendon, and the tendon the common sense, and the common sense is the seat of the soul, and the memory is its monitor, and its faculty of receiving impressions serves as its standard of reference. How the sense waits on the soul, and not the soul on the sense, and how where the sense that should minister to the soul is lacking, the soul in such a life lacks conception of the function of this sense, as is seen in the case of a mute or one born blind.” (da Vinci 1955, pp. 110-111)

# Meta-Trend 2: Blindness as Intellectual Concept and Mind

- Thomas Aquinas, (Colish 1975) in Summa Theologica around the 1260s developed the concept of spiritual blindness
- His question, “Whether Every Human Action Is Good, or Are There Evil Actions?” he draws analogies between the good – light – and sin / evil – darkness

“[While] so far as he is lacking in goodness, and is said to be evil: thus a blind man is possessed of goodness inasmuch as he lives; and of evil, inasmuch as he lacks sight.” (Aquinas 1923, P. 694)

“Therefore blindness, of its very nature, is directed to the damnation of those who are blinded; for which reason it is accounted an effect of reprobation. But, through God's mercy, temporary blindness is directed medicinally to the spiritual welfare of those who are blinded. This mercy, however, is not vouchsafed to all those who are blinded, but only to the predestinated, to whom "all things work together unto good" (Rom. 8:28) ... Therefore, as regards some, blindness is directed to their healing; but as regards others, to their damnation [according to Augustine].” (Aquinas 2006, P. 636)



# John Calvin: Blindness of Mind

- Not exclusively a Protestant concept, but “blindness of mind” or the “blind / blinded mind” important to John Calvin
- saw blindness of mind as an incapacity to “see” the truth of God, and led to damnation
- Two forms : the elect who opened themselves to the will of God, and the reprobate, who remained “blind of mind”

“[None] are truly illuminated with faith, and none granted the spirit of regeneration, except for those whom God elects. But it is necessary that the reprobate remain in their blindness or be deprived of such portion of faith as is in them.” (Calvin 1954, P. 179)

- In his Catcheism, Calvin reinforces the struggle between God and Satan

## “NATURAL MAN

We acknowledge man by nature to be blind, darkened in understanding, and full of corruption and perversity of heart, so that of himself he has no power to be able to comprehend the true knowledge of God as is proper, nor to apply himself to good works. But on the contrary, if he is left by God to what he is by nature, he is only able to live in ignorance and to be abandoned to all iniquity.” (Calvin 1954, P. 28)

# The Enlightenment Episteme

Empiricism, Touch and Perception as Learnt

# Meta-Trend 1: Empiricism, Proximity and Vision

- In 1620 Francis Bacon theorized that what were regarded as lesser senses had the advantage of detecting potentially scientific data beyond the horizon
- Doubted the supremacy of sight and to a lesser extent sound as the ultimate two senses, and suggested the remaining three senses were able to measure natural objects
- Humans had the potential to feel heat or burning sensations caused by flames and others setting fires far away

Objects further away sight provided more reliable sensory data, but weight or mass could not be measured accurately via sight

“Sight, for instance, is not easily effective in contact, but requires a medium and distance; although I remember having heard from a person deserving of credit, that in being cured of a cataract (which was done by putting a small silver needle within the first coat of the eye, to remove the thin pellicle of the cataract, and force it into a corner of the eye), he had distinctly seen the needle moving across the pupil ...” (Bacon 1902, P. 103).

# Renes Descartes: Light Like Blind Man's Cane

- In *Discourse on Method*, 1637, Rene Descartes focussed on empirical problem solving
- As one of three appendices, Dioptrics discussed the physical nature of light as analogous to a material object

“[Just] as our blind man can feel the bodies around him not only through the action of these bodies when they move against his stick, but also through the action of his hand when they do nothing but resist the stick, so ... objects of sight can be perceived not only by means of the action in them which is directed towards our eyes, but also by the action in our eyes ...”

(Descartes 1988, P. 59)

- Treatise on Light argued it was conceivable for there to be a difference in what humans see and what is actually in the physical world

“Of all our senses, touch is the one considered least deceptive and the most secure; so if I show you that even touch leads us to conceive many ideas which do not resemble in any way the objects that produce them, I believe you should not find it strange when I say that the same holds for sight. Now everyone knows that the ideas of tickling and pain which are formed in our thought when bodies from outside touch us bear no resemblance at all to these.”

(Descartes 1998, P. 5)

# Meta-Trend 2: Perception as Learnt Knowledge

- Second edition of his Essay Concerning Human Understanding, 1690, Locke hypothesized knowing was not innate
  - hypothetical scenario followed by a question in a letter to Locke by William Molyneux:
    - Imagine immediately after a born blind man gained sight, and was shown a cube and a globe ontop of a table that was beyond his reach, could he recognise the globe as a globe and the cube as a cube purely by his newly acquired sight?
  - Locke suggested two distinct forms of knowledge and understanding in answer:
    - knowledge that leads to a simple form of understanding (K1)
    - knowledge that leads to a deeper understanding (K2)
- “[When] his sight is cleared, he will certainly assent to this proposition, “That the sun is lucid, or that saffron is yellow.” [K1] And therefore, if such an assent upon hearing cannot prove the ideas innate, it can much less the propositions made up of those ideas [K2]. If they have any innate ideas, I would be glad to be told what, and how many, they are.” (Locke 1999, P. 78)

# Cheselden: The Empirical Testing of Molyneux's Question

- Surgeon Cheselden (1728) developed a surgical technique to remove congenital cataracts
  - The first procedure on a 13-year-old boy with congenital cataracts in both eyes, cataracts removed a year apart
  - Boy was able to recognise light, but not conceptualise the shape of objects
  - Immediately after the surgery, the boy was unable to identify objects until learning by touch and sight [K2]
  - Inability to recognise objects and conceptualise space beyond his immediate environment [K2]
  - After the second cataract was removed, the boy was less confused by his new vision
- “A Year after first Seeing, being carried upon Epsom Downs and observing a large Prospect, he was exceedingly delighted with it, and call'd it a new Kind of Seeing. And now being lately couch'd of his other Eye [having the second cataract removed], he says, that Objects at first appear'd large to this Eye, but not so large as they did at first to the other; and looking upon the same Object with both Eyes, he thought it look'd about twice as large as with the first couch'd Eye only, but not Double, that we can any Ways discover.” (Cheselden 1728, P. 450)

LETTRE

SUR

LES AVEUGLES,

A L'USAGE

DE CEUX QUI VOYENT.

*Possunt, nec posse videntur.*

Virg.

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A LONDRES.

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M. DCC. XLIX.

# Diderot – Letter on the Blind (1749)

- Denis Diderot's Letter on the Blind for the Use of Those Who Can See, 1749, Diderot agreed with Locke's thesis that knowing was learnt
- He disagreed that sight was the most important sense, proposing that touch and hearing were as important in developing K2
- Two cases were particularly important to Diderot in illustrating this capacity
- Cited Nicholas Sanderson, blind Lucasian Professor of Mathematics at Cambridge University, and a man born blind that Diderot observed in Puiseaux, with a family and a middle-class career

“This blind man, we said, values himself as much as, and perhaps more than, we who see. Why then, if the brute reasons (and it is scarce to be doubted), why on weighing its advantages over man as better known to it than those of man over it, should it not make a similar inference ? ... We have such a strong desire to exaggerate our qualities, and make little of our defects, that it would seem man's part to write a treatise on force, and animals' on reason.” (Diderot 1916, P. 76)



Conclusion

- The main evolution of the Western epistemology of blindness and visual impairment was the development of an embryonic Western empiricism, the need of science to understand vision as its instrument, and the understanding of blindness and visual impairment as disability
  - There are four observations that can be made about the development of this epistemological process after antiquity that changed the way that these historical epistemes conceptualized blindness and visual impairment
1. Linking the development of an embryonic development of Western science and a greater need to understand vision and blindness
  2. The lack of linear progression in the Western conceptualization of vision, and by extension blindness and visual impairment;
  3. What can be called the “rise and fall” of the role of Christianity in the Western conceptualization of blindness and visual impairment
  4. The evolution of the psychological difference between no sight and minimal sight from birth to older age

# References and Select Bibliography

- Al-Haytham, I. (A. I. Sabra, Trans.). (1989) *The Optics of Ibn Al-Haytham*. London, UK: The Warburg Institute, University of London.
- Alhazen, Risner, F., Gherardo, & Witelo. (1572). *Opticae thesaurus*. Basel, Switzerland: Per Episcopios.
- Aquinas, T. (Trans. Fathers of the English Dominican Province). (2006). *Summa Theologica, Part I-II (Pars Prima Secundae)*. Chapel Hill, NC: Project Gutenberg.
- Aquinas, T. (Trans. Sullivan, D. J.). (1923). *The Summa Theologica of Thomas Aquinas*. Chicago, IL: Encyclopaedia Britannica Inc.
- Artmann, B. (2012). *Euclid: The creation of mathematics*. New York, NY: Springer.
- Bacon, F. (1902). *Novum Organum, or True Suggestions for the Interpretation of Nature*. New York, NY: P.F. Collier & Son. <https://www.gutenberg.org>.
- Bacon, R. (R. B. Burke, Ed.). (1928). *Opus Majus, Volumes 1 and 2*. Philadelphia, PA: University of Pennsylvania Press.
- Bacon, R. (R. Belle Burke Trans). (1962). *The Opus Majus, Volume II*. New York, NY: Russell and Russell, Inc.
- Berkeley, G. (1709). *An Essay Towards a New Theory of Vision*. Dublin, ROI: Trinity College, Dublin (originally Printed by Aaron Rhames, at the Back of Dick's Coffee House, for Jeremy Pepyat Bookseller in Skinner-Row. <https://www.maths.tcd.ie/~dwilkins/Berkeley/Vision/1732B/Vision.pdf>).

- Calvin, J. (Reid, J. K. S.). (1954). Calvin: Theological treatises. London, UK: SCM Press.
- Cheselden, W. (1728). An Account of Some Observations Made by a Young Gentleman, who was Born Blind, or Lost his Sight so Early, That he had no Remembrance of Ever Having Seen, and Was Couch'd Between 13 and 14 Years of Age. *Philosophical Transactions of the Royal Society*, 35, pp. 447–450.
- Colish, M. L. (1975). St. Thomas Aquinas in Historical Perspective: The Modern Period. *Church History*, 44(4), 433–449. <https://doi.org/10.2307/3163823>.
- Da Vinci, L. (MasCurdy, E., Trans.). (1955). *The Notebooks of Leonardo da Vinci*. New York: George Braziller.
- Davidson, M. W. (2014). Pioneers in Optics: René Descartes and Jan Albertus Magnus. *Microscopy Today*, November 2014, pp. 48-49.
- Descartes R. (1998). *The Treatise on Light*. In (Gaukroger S, ed.) *Descartes: The World and Other Writings*. Cambridge, UK: Cambridge Texts in the History of Philosophy. Cambridge, UK: Cambridge University Press (pp. 3-75).
- Descartes, R. (1988). *Descartes: Selected Philosophical Writings*. Cambridge, UK: Cambridge University Press.

- Diderot, D. (Jourdain, M. Trans.). (1916). Diderot's Early Philosophical Works. Chicago, IL: The Open Court Publishing Company.
- Ferretti, G., & Glenney, B. (Eds.). (2020). Molyneux's Question and the History of Philosophy. Abingdon, UK: Routledge.
- Grzybowski A, & Witczak W. (2008). From Lens to Retina: The historical survey on the search of the receptive part of the eye. *Klinika Oczna / Acta Ophthalmologica Polonica*, 110(10), pp.405-9.
- Hume, D. (2011). *An Enquiry Concerning Human Understanding*.  
<https://www.gutenberg.org/files/9662/9662-h/9662-h.htm#section1>.
- Jaeger W. (1986). Johannes Keplers Bedeutung für die Ophthalmologische Optik [Johannes Kepler's Contributions to Ophthalmologic Optics]. *Klinische Monatsblätter für Augenheilkunde*, 188(2), pp. 163–166.  
<https://doi.org/10.1055/s-2008-1050605>
- Keele, K. D.. (1983). *Leonardo Da Vinci's Elements of the Science of Man*. New York, NY: Academic Press.
- Kelso C. J. (2003). *Witelonis perspectivae Liber Quartus Book IV of Witelo's Perspectiva: A critical edition and English translation with introduction notes and commentary*. Columbus, MS: University of Missouri.

- Kepler, J (1604) *Ad Vitellionem Paralipomena, Quibus Astronomiae Pars Optica Traditur*. Frankfurt, Germany: Claudium Marnium and Haeredes Joannis Aubrii [Reserve 520]
- Locke, J. (1999). *Essay Concerning Human Understanding*. Philadelphia, PA: Pennsylvania State University.
- Rabin, Sheila J. (2010) *Oxford Bibliographies: Johannes Kepler*. Oxford, UK: Oxford University Press. Accessed: 08/03/2016 <https://doi.org/10.1093/obo/9780195399301-0047>.
- Smith, A.M. (2002). *The Science of Optics to the Time of Kepler*, In *Encyclopaedia of the History of Science*. Pittsburgh, PA: Carnegie Mellon University. <https://doi.org/10.34758/9482-n985>.
- Spellman, W. M. (1997). *John Locke*. Hampshire, UK: Macmillan.
- Unal N, and Elcioglu O. (2009). *Anatomy of the Eye From the View of Ibn Al-Haytham (965-1039), The Founder of Modern Optics*. *Saudi Medical Journal*, 30(3), pp. 323-328.
- Zubairy, M.S. (2016). *A Very Brief History of Light*, In Al-Amri, M., El-Gomati, M., Zubairy, M. (eds) *Optics in Our Time*. Basingstoke, UK: Springer Nature. [https://doi.org/10.1007/978-3-319-31903-2\\_1](https://doi.org/10.1007/978-3-319-31903-2_1).