

# Values, Norms and Ideologies in Early Modern Inquiry: An Introduction

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Early modern epistemic discourses were heated by an intense competition of various ideals of intellectual activity, not exclusively in the field of epistemic values, but also in those of artistic, moral, and religious ideals; and not merely theoretically, but also with respect to actual practice. How to produce knowledge, how to understand what had been produced, and questions concerning useful and legitimate ways of applying the knowledge thus gained were central issues.

Knowledge-making practices have always been accompanied by answers to such questions that one could aptly call *ideologies*: that is, more or less explicit ways of making sense of these practices, justifying their relevance, and circumscribing the sphere of legitimate inquiry and applications. Since ancient times, natural inquiry had been driven by the need to make the world intelligible. The standards of *intelligibility*, however, were under constant revision in the early modern period, and consequently knowledge claims underwent a process of continuous re-evaluation. The Baconian ideology of knowledge production put an increased emphasis on the *usefulness* of knowledge alongside its moral *goodness*.<sup>1</sup> These values—intelligibility and usefulness—bring to the fore the relations of abstract ideas (e.g., of methodologies and ontologies) and concrete practices (e.g., of producing and using knowledge). Knowledge produced in various ways was also put to non-Baconian, artistic, and ideological uses too. In these contexts, ideas had a pragmatic significance beyond their literal meaning.

Historical research in previous decades has done a great deal to explore the social and political context of early modern natural and moral inquiries. It has revealed in many ways how theories were embedded in contexts of

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1 On intelligibility and usefulness as ideologies of modern science see e.g. Dear P., *The Intelligibility of Nature: How Science Makes Sense of the World* (Chicago: 2006). On the moral character of natural philosophy see e.g. Gaukroger S., “The Persona of the Natural Philosopher in the early to mid Seventeenth Century”, in Condren C. – Gaukroger S. – Hunter I. (eds.), *The Philosopher in Early Modern Europe: The Nature of a Contested Identity* (Cambridge: 2006) 17–34, and more recently Corneanu S., *Regimens of the Mind: Boyle, Locke, and the Early Modern Cultura Animi Tradition* (Chicago: 2011).

non-epistemic values, and reconstructed on several planes their non-epistemic content and pragmatic relevance. As a result, we have ingenious and revealing narratives about theories put forward in epistemic contexts as attempting to reach certain social goals and bearing on ideological conflicts. At the same time, the epistemic content of inquiry has been frequently relegated to a secondary role.

Particularly since Simon Schaffer and Steven Shapin's *Leviathan and the Air-Pump* (1985),<sup>2</sup> which exposed the political and religious commitments and purposes underlying the debate between Robert Boyle and Thomas Hobbes on the experimental method and the existence of a vacuum, we have become accustomed to studies which attribute epistemological stances and debates to clashes of political and theological ideologies. The worth of such studies, revealing the ways in which texts apparently organized with an eye on epistemic values and virtues did in fact serve social and political aims and motivations, is not here in question. The present volume suggests that with an awareness of this context, it is now worth turning back to questions of the epistemic content itself.

The contributors to the present collection were invited to explore how certain non-epistemic values had been turned into epistemic ones, how they had an effect on epistemic content, and eventually how they became ideologies of knowledge playing various roles in inquiry and application throughout early modern Europe. These ideological conflicts reflected the fact that the list and hierarchy of the various values attached to knowledge-making practices were also unstable, and were coupled with a similar instability in how the proper methods of inquiry were conceived, and how their results could be turned into practice. By the end of the period, as Peter Dear has argued, the Baconian ideology of instrumental utility emerged at the top of this hierarchy; it is still the dominant one today.<sup>3</sup> But this outcome was not inevitable, and early modern inquiry was not homogeneous: it was a gradual process at the end of which instrumentality proved to be triumphant. And although this ideology is dominant in modern science, its eventual triumph was preceded by a clash of diverse ideologies also present in Bacon, among the members of the Royal Society, and indeed, throughout the scholarly communities of Europe.

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2 Schaffer S. – Shapin S., *Leviathan and the Air-Pump: Hobbes, Boyle and the Experimental Life* (Princeton, NJ: 1985). On its afterlife and impact see idem, “Up for Air: *Leviathan and the Air-Pump* a Generation on” in the new edition (Princeton, NJ: 2011) xi–l.

3 Dear P., “What is the History of Science the History of? Early Modern Roots of the Ideology of Modern Science”, *Isis* 96 (2005) 390–406.

Competing values profoundly influenced the understanding of the knowledge that had been produced, and the ways in which boundaries between legitimate and forbidden ways of applying theoretical knowledge were drawn. If one thought, for example, that the task of natural philosophy was to explain the material world in terms of purely mechanical processes, because that is how inert matter should work, then one would naturally respond to the question of whether Newton's natural philosophy was correct by responding that only his mathematics was accurate, and nothing else—as did Huyghens in a widely cited letter responding to an enquiry from Locke.<sup>4</sup> Clearly, it is not instrumentality that motivates Huyghens's response in this case: he was not satisfied with empirical adequacy necessary for the manipulation of the natural world, because his primary aspiration was to be found elsewhere, namely in intelligibility by his own standards.

Nothing illustrates the strength of this way of making sense of the world better than the fact that even Newton himself tried to explain his theory by the standards of Cartesian mechanism—that is, standards corresponding to Huyghens's preference. And upon realizing that it was impossible he decided, as Imre Lakatos aptly put it, to change the standards instead.<sup>5</sup> By doing so, Newton took on ideological work: he would revise the standards of intelligibility and the standards by which epistemic value is judged. A crucial monument of this ideological work is his “Fourth Rule for the Study of Natural Philosophy”,<sup>6</sup> which effectively proclaims that metaphysical reasoning must not be allowed to force us to reject inductive evidence. This is part of what Eric Schliesser has termed as ‘Newton's challenge to philosophy’, an epistemically relevant ideological change indeed.<sup>7</sup>

Gradual transformation in the ideologies of inquiry can be explored in moral philosophy as well, including what many early modern philosophers called ‘the science of man’. Several moral theories were put forward with an emphasis on their role in settling questions of political legitimacy, as in Thomas Hobbes, or in providing a theological *cum* teleological understanding of man as in Joseph Butler. Of course, moral philosophy was also presented as an inquiry capable of providing a firm foundation for morality in various ways, as in the works of Carmichael, Grotius, Pufendorf, and Hutcheson, but subsequently it would be

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4 Dear, *The Intelligibility of Nature* 26–27.

5 Lakatos I., “Newton's Effect on Scientific Standards”, in idem, *The Methodology of Scientific Research Programmes. Philosophical Papers* 1 (Cambridge: 1978) 193–222.

6 See Newton Isaac, *Philosophical Papers* (Cambridge: 2004) 89.

7 Schliesser E., “Newton's Challenge to Philosophy”, *HOPOS: The Journal of the International Society for the History of Philosophy of Science* 1 (2011) 101–128.

represented as a value-neutral inquiry instrumental in improving society, particularly in the hands of David Hume and Adam Smith. These different sets of values shaped the methods of moral inquiry and the styles of argument; they set and revised the boundaries of its proper field, prescribed the legitimate ways of drawing inferences and using evidence, fixed premises to start from and the kinds of evidence to rely on, and constantly re-defined the purpose and function of moral inquiry itself.

Various visions of how knowledge should be produced and used naturally influenced the image of a man of science. Different ideologies of knowledge-production entailed different views on the virtues one should possess in order to be someone taking part in the production of knowledge. Virtues required in inquiry went through considerable change during the period. On the one hand, the emerging new disciplines did not fit traditional classifications of knowledge, based on the Aristotelian *habitus intellectuales*, and required new foundations in different powers and virtues of the mind. On the other hand, new knowledge-making practices placed emphasis on previously unknown or disregarded virtues. Here one can think of Copernicus following his path with an eye on *aesthetic* values like the *uomo universale*,<sup>8</sup> or of the role that the values of courtiers, artisans, and gentlemen played in the spread and development of experimental practices. It took a gradual process in which the credibility and other epistemic virtues of a specialist replaced those of a *virtuoso* naturalist, and in which the ideal of the moralist gave way to the detached and impartial observer of human nature and society.<sup>9</sup>

This development, however, should not overshadow the fact that the study of nature typically had an intrinsic moral agenda. As recent literature and several contributors in the present volume suggest, epistemic and moral content were intertwined in early modern natural philosophy making it also an ethical pursuit of the cultivation of *habitus*. As Sorana Corneanu has recently argued, natural philosophers in the period frequently represented their project as an enterprise for perfecting the human mind. This stance lends a much broader

8 On the influence of Copernicus's heritage in the early modern period see Neuber W. – Rahn T. – Zittel C. (eds.), *The Making of Copernicus: Early Modern Transformations of a Scientist and His Science* (Leiden: 2015).

9 Centrally important works on this process include: Biagioli M., *Galileo, Courtier: The Practice of Science in the Culture of Absolutism* (Chicago: 1993); Shapin S., *The Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago: 1994); Roberts L. – Schaffer S. – Dear P. (eds.), *The Mindful Hand: Inquiry and Invention from the Late Renaissance to Early Industrialisation* (Chicago: 2008). On the development of the ideals of impartiality and objectivity in the period see Murphy K. – Traninger A. (eds.), *The Emergence of Impartiality* (Leiden: 2014).

significance to claims of utility than a purely instrumental understanding would suggest, and reveals the moral import of theories that underlies their epistemic content.<sup>10</sup>

The present volume elaborates on these various manifestations of early modern ideologies of knowledge through a series of historical case studies. As Peter Dear points out in his paper, 'prominent epistemic themes of the period ran through many different modalities of philosophical representation', which prevents the topic to be discussed from a unitary perspective. As a consequence, the papers derive methodological inspiration from various sources. Besides the received methods of intellectual history, perspectives derived from historical epistemology and the sociology of knowledge also inform some of the papers.

The volume begins with Peter Dear's case study, which cuts across various themes subsequently discussed in other contributions. Starting from an evaluation of what the sociology of scientific knowledge has achieved in the past decades, Dear introduces the problem of interconnecting epistemic categories and their interplay with extra-theoretical contexts and considerations in the political scene. He argues that the proper approach to the uses of epistemic themes in the period is to treat them as intrinsically interconnected, as exemplified in Descartes, Hobbes, Chauvin, and the Scholastic tradition. He illustrates this thesis particularly through Robert Hooke's 'attempt to materialize ontological categories', including those of the intellect, by translating the latter into the mechanical idiom. Subsequent papers discussing various aspects of similar interconnections are grouped into six sections.

The first section considers the role that early modern engineering and technical devices played in the transformation of epistemic values. Matteo Valleriani explores the interconnection between a field of practical knowledge production, namely military engineering, and natural philosophical discourses. He argues that sixteenth-century Italian engineers and practical mathematicians developed new anti-Aristotelian conceptions of matter whose process of theoretization reflects both the tradition of commentary literature on ancient authors and the emerging practice of systematic references to 'repeatable practical experiences'. The tension between the values of the two practices was constitutive in epistemic developments connected to the requirements of early modern warfare and court society. Dániel Schmal focuses on how the *camera obscura* came to play a formative role in the 'Cartesian paradigm of cognition'. Given the socio-cultural context in which the device was prominent, Schmal argues that it is the device's capacity to reconfigure the information

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10 Corneanu, *Regimens of the Mind*.

it receives, rather than its indirect representational capacities, that actively contributed to the emergence of the Cartesian ideal of a cognitive individual. Schmal emphasizes the *reliability* ascribed to the perceptual knowledge that the *camera obscura* produces, and downplays its significance as a model of seeing. The *camera* thus turns out to be an instrument that incorporates 'a set of values and ideological motivations inherent in the *practice* of modern science'. Thus understood, the epistemic role of the *camera* is to be found in the context of testimony and the production of new facts through contrived experience—the central problems of the next section.

The second section is devoted to a central problem of early modern social epistemology, namely testimony—a field where epistemic, social, and moral values are perhaps most intrinsically connected. John Henry explores the debate between John Locke and John Sergeant, and argues that while Locke tailored his individualistic epistemological principles to the requirements of religious tolerance, Sergeant's Catholicism drove him to downplay individualistic and personal interpretations of Scripture and emphasize the role of accredited figures in the production and transmission of knowledge. Thus Sergeant can be read as an early social constructivist challenging individualistic epistemologies. Falk Wunderlich emphasizes the central role testimony came to play in epistemological discourses of both science and religion, and he points out that the 'early modern reluctance about testimony' is due to its close association with religious knowledge claims that undermined its general epistemic value in the eyes of several Enlightenment thinkers. In this context, he takes a closer look at the philosophical tenability of the only exception David Hume allows to his universal ban on the acceptance of miracle reports, namely the case of unanimous testimony of a large number of witnesses. Wunderlich argues that for Hume not even this exception can make knowledge claims legitimate in religious contexts, because such miracles are to be incorporated into a general framework of natural laws and should thus be withdrawn from the realm of religious knowledge claims.

The next section immerses us further in questions of how values and norms associated with religion entered into various disciplines and were related to epistemic discourses. Giora Hon argues that, in contrast with received wisdom, Kepler's *Astronomia nova* plays a more prominent role in the transformation of medieval into modern science than Copernicus's *De revolutionibus*. Hon argues that Kepler's theology of unity is the key to understanding his achievement: Kepler's 'comprehensive view of the world', which unites geometry, physical explanation, and observation, is granted by an 'overarching theological perspective'. What Kepler achieved in the process of unification disappeared from view due to contradictory historiographies that failed to

appreciate it as a comprehensive view of the world that sprang from theological roots. Tamás Demeter's paper is focused on David Hume's discussion of providence and wonders, and argues that he challenges the cognitive authority of both revealed religion and natural theology. These passages are to be read as undermining early modern aspirations to lend theological legitimacy to natural inquiry, and also as gesturing toward a secular ideology of modern science. János Tanács argues that the emergence and development of non-Euclidean geometries, and eventually János Bolyai's achievement, was intertwined with the social values characteristic of the intellectual milieu of the Protestant parts of eighteenth-century Hungary, a milieu whose interest in the Problem of Parallels can be aptly contrasted with the indifference to such questions in the Catholic parts. Tanács's paper illuminates the transmission of certain religious and social values into the realm of mathematics by showing how conflicting values played a selective role in setting the boundaries of theoretical controversies in the context of both positive and negative reception.

The papers in section four extend the discussion on the role of controversies in shaping epistemic values beyond the sphere of religion to natural and civil philosophy. Gábor Zemplén discusses Newton's 'strategic manoeuvring' in the controversy ensuing from the publication of his "New Theory of Light and Colours". Zemplén interprets Newton's argumentative strategy as aiming at minimizing the possibility of rejection and maximizing social credit. In effect, this strategy turns out to be channelling queries and challenges so as to help him to adjust the scope of his optical enterprise when facing challenges, and to facilitate the conversion of potential followers. Axel Gelfert argues that Hobbes's commitment to the value of geometrical reasoning as a means of generating assent in both natural and civil philosophy was an important source of controversy between him and the leading mathematicians of his time. In Gelfert's reconstruction, Hobbes's insistence on his core and controversial beliefs about geometry despite superior arguments is due to certain, and for him unwelcome, methodological consequences with respect to the value of demonstrative reasoning in the field of civil philosophy. Gelfert concludes that Hobbes's insistence on his mathematical opinions violates his own precepts against intolerable stubbornness in society.

Section five continues the discussion of epistemic values and virtues associated with the study of man and society in the field of a characteristic eighteenth-century discipline, the 'science of man'. Thomas Sturm argues that the various attempts to transfer the method of analysis-synthesis, i.e. the ideal methodology of early modern natural philosophies, to the human sciences proved to be futile. After exploring various attempts to adopt this methodological ideal in the human sciences, Sturm concludes that the failure of such attempts is



partly due to some central methodological values of contemporary natural philosophies that constrained acceptable inferences, and thus the established epistemic values of natural inquiry could not be effectively adopted by authors working in relative isolation. Eric Schliesser reconstructs three intellectual traditions that Hume invokes at various places in his *oeuvre* as the sources of his 'science of man'. The changes between them, Schliesser argues, reflect changes in Hume's understanding of the epistemic virtues underlying his project, and the evolution of his vision on the place of a 'science of man' in the system of sciences.

The final section broadens the discussion from epistemic virtues to moral ones, and illustrates the fundamental significance of ethics for early modern epistemology. Sorana Corneanu explores the central role charity plays in Bacon's programme for the reformation of learning. Corneanu argues that charity for Bacon is not restricted to the outcome of the pursuit of knowledge, but has a wider scope: the fruitfulness of knowledge has various forms in natural inquiry itself and in the process of transmitting knowledge. These fruits rest on a number of epistemic virtues that are counterparts of moral-religious virtues, and they can be aptly taken to constitute the fruits of charity. Ruth Lorand argues that Spinoza's attempt to derive values from nature failed, and for this reason he also failed to ground his vision of the ideal life on metaphysics. Instead, Lorand argues, Spinoza in fact derived his metaphysics starting with his ideal of man in mind, and it was through this ideal that he conducted his inquiry into nature, and not the reverse way. Spinoza's account of natural phenomena is thus a value-driven enterprise from its outset. Catherine Wilson's contribution offers an alternative to the view that Kant's project is a descriptive enterprise aiming to explain the mind's contribution to experience. Starting from Kant's own account of his project, Wilson argues that it is revisionary with certain ideological overtones: he joins metaphysics to morals with the intention of criticizing the perspective adopted by many of his Enlightenment contemporaries. On this reading, Kant's metaphysics of nature, combined with his metaphysics of morals, was motivated by Kant's anti-scientism, rigorism, and a teleological understanding of history, and it was eventually wielded against the relativistic, observational anthropology practiced in France, Germany, and Scotland.

It is hoped that the case studies in the present collection will prove to be useful and inspiring contributions to discussions centred on the role values, virtues, and ideologies played in various fields of early modern knowledge production. Indeed, the volume as a whole drives towards the study of those values, norms, and standards that unify knowledge-making practices, which



otherwise, from the perspective of different disciplinary canons, may easily seem to be entirely disjointed.

### Selective Bibliography

Corneanu S., *Regimens of the Mind: Boyle, Locke, and the Early Modern Cultura Animi Tradition* (Chicago: 2011).

Dear P., *The Intelligibility of Nature: How Science Makes Sense of the World* (Chicago: 2006).

Murphy K. – Traninger A. (eds.), *The Emergence of Impartiality* (Leiden: 2014).

Schaffer S. – Shapin S., *Leviathan and the Air-Pump: Hobbes, Boyle and the Experimental Life* (Princeton, NJ: 1985).