

SCIENTIAE 2019: ABSTRACTS (WEDNESDAY, June 12th).

11:00-12:30, Pre-conference session.

Matteo Valleriani (MPI-History of Science, Berlin): “Computational History: *Terra incognita*.”

What is computational history and why do we need it? On the basis of current research endeavors, the lecture explores the possibilities and the actual limits of the integration of computer sciences, digital humanities and mathematics with history writing. Finally, possible future interactions between developments in artificial intelligence and history will be proposed.

1:00-2:30, Plenary session.

Ian Campbell (Queen’s University, Belfast): “*War and the Supernatural in Early Modern Europe*.”

Historians of political thought pay considerable attention to the Dominican and Jesuit theologians of the sixteenth and seventeenth centuries, ascribing to them a hard distinction between nature and supernature. Quentin Skinner, for example, understands the “natural” category to be very close to our modern, secular one – an area of human life drained of the divine. The Dominican and Jesuit rejection of holy war, moreover, is often used as a token of the strength of this natural category. But both Skinner and Richard Tuck ignore the early modern Franciscan tradition which did not distinguish between nature and supernature in the same way, and did not reject wars fought for evangelisation. More strangely, both Skinner and Tuck largely ignore the Protestant scholastics, Lutheran and Reformed, who treated warfare with distinctively Protestant accents (to use Michael Becker’s term). When these Catholic and Protestant perspectives, excluded by Skinner and Tuck, are included in our history, it becomes easier to see why the Italian scholar Paolo Prodi saw the development of the European state in the early-modern period not as a process of secularisation, but as a process of sacralisation.

Weds 3:00-4:45, Parallel Session (PS) 1: “Geometry, Mechanics, Physico-Mathematics, and Natural Philosophy.”

J.B. Shank: This panel (linked with Thursday 1:30 PS1), brings together core investigators in the “Emergence of mathematical physics in the context of experimental philosophy” project at the Institute for Research in the Humanities (IRH) at the University of Bucharest with an array of other interested scholars from around the world working on related topics.

Ovidiu Babes (Bucharest), “Mechanics and cosmology in Roberval’s *Aristarchi ... systemate*.” This presentation investigates a peculiar attempt to extend methods of mechanics into natural philosophy, specifically Gilles Personne de Roberval’s under-investigated cosmological/astronomical treatise, published in 1644 under the name *Aristarchi Samii de mundi systemate*. Roberval accepts two types of forces: violent (acting through collisions, local) and attractive (acting at a distance, through other media). In *Aristarchi*, he presents the latter as an intrinsic property of matter. Attractive force may be experimentally determined by comparative measurements of density of matter. This was aimed at unifying accounts of Earthly and celestial phenomena. *Aristarchi* ultimately offers an eclectic cosmology, borrowing from Kepler, Descartes, Copernicus, and possibly Kenelm Digby. While agnostic, Roberval is constantly arguing that probable explanations can be more or less corroborated by experimental/mechanical methods. The treatise indicates a blurring on Roberval’s part of the boundaries between traditional mixed-mathematics and new projects of physico-mathematics.

Simon Dumas Primbault (Florence/ Paris), “Florentine *disegno* as a form of mathematization: Field notebooks of Vincenzo Viviani (1622-1703).” After Galileo’s death in 1642, his last disciple Vincenzo Viviani became court hydraulician in charge of travelling the Tuscan countryside to survey the Val-d’Arno so as to produce expert reports intended for the *Capitani di parte* – the Tuscan engineering corps. Among his bounteous field notes Viviani left numerous drawings and sketches made of sanguine, ink, or pencil; from life or from memory. I propose to delve in this personal archive made of landscapes and genre scenes, as well as technical schematics, and to conceive of it as a place of knowledge by focusing on its materiality, revealing savant practice: the meticulous observation of nature, the extraction of the relevant forms, and their translation into a graphic language that allows for the emergence of knowledge. Eventually turning to the mathematical drawings Viviani produced at the end of the century to study the mechanics of Brunelleschi’s cupola in Florence, this paper aims at investigating the practical epistemology of *disegno* as a way of mathematizing nature in the practice of early-modern nascent physico-mathematics as well as mathematical physics.

Niccolò Guicciardini (Bergamo), “Archimedean tradition in Newton’s conceptions of the relationships between mechanics and geometry.” Newton’s conceptions of the relationships between mechanics and geometry are often discussed in terms of Newton’s reading of Pappus’s *Collectiones*. The purpose of my talk is to explore how Newton’s reading of Archimedes’s works influenced his ideas on geometry and mechanics. I will consider Newton’s reading of some propositions from the *Book of lemmas* (attributed to Archimedes), from *On spirals* and from *Conoids & Spheroids*.

Weds 3:00-4:45, PS 2: “Aristotelian Trajectories (I).”

Per Landgren (Oxford), “Hidden Zabarellan empiricism.” One of the most important ongoing debates about the origin of modern science was triggered by John Herman Randall in 1940, who highlighted the influence of the Paduan logician Jacobus Zabarella (1533-1589) on key scholars such as Galileo. The questions could be reduced to two: where did Galileo get his probative observations or probative empiricism from? Was he, who also taught for some time in Padua, influenced by Zabarella—the magisterial champion of 16th-century Aristotelianism? The debate has continued with important contributions by scholars such as Cassirer, Gilbert, Poppi, Schmitt, Jardine, Mikkel, Reiss, Palmieri and Sgarbi. Much attention has been drawn to the importance of his methods and, more particularly, the different kinds of demonstrative syllogisms, *demonstratio quia*, and *demonstratio propter quid*, and the combination of the two, *regressus*. A problem, though, is that logic was strictly deductive and only true premises were allowed, which gave no room for induction. Given that *logica applicata* or *logica utens* was deductive logic in the form of a science, i.e. a theoretical discipline, where in his logical works and, therefore, in his theory of science as absolute knowledge, did Zabarella, as an empirical Aristotelian, implement his empiricism? In my paper, I will present my view on this question.

Julia M. Reed (Harvard), “The Forensics of incorruption in early modern medicine: The Empirical Aristotelianism of Paolo Zacchia.” The oft-cited father of forensic medicine, the seventeenth-century papal physician and lawyer Paolo Zacchia, defended the superior expertise of the medical professional who, by “incessantly pursu[ing] the works of nature,” was able to discern what “deviates” from the normal operations of nature and what exceeds its operations. In this paper I offer a close reading of Book IV, Question 10 of Zacchia’s masterwork, *Quaestiones medico-legales*, on the determination of incorruptible cadavers, and specifically Zacchia’s guidance in distinguishing “false” incorruption from the “proper” incorruption that marked the medical miracle of supernatural preservation. According to Zacchia, the physician had to take particular care to eliminate all the natural operations that might delay corruption, which ranged from embalming to the unique temperament, medical history, and cause of death of the deceased, in which case the body could appear incorrupt to the untrained observer. I will argue that Zacchia’s definition of true or proper incorruption was a key development in the “empirical Aristotelianism” of the commentary tradition on the fourth book of Aristotle’s *Meteorology*, associated with alchemy and an “alternative” Aristotelianism based in experiment and observation since the Latin translations of the twelfth century.

David McOmish (Glasgow), “Adam King and the University of Edinburgh, 1612-1660.” Modern scholarly consensus has characterised the philosophical and scientific culture of pre-Enlightenment Edinburgh as completely Aristotelian and consequently wholly backward. This picture has largely been facilitated by a reductive interpretation of the formal influence of Aristotle and Sacrobosco in official university documentation. It has only now come to light that all of the official university graduate Theses from 1612 onwards, and the surviving student dictates from the same period, are edited sections from a mathematical and cosmological commentary written by Adam King, originally from Edinburgh, but a professor of mathematics and philosophy for nearly 20 years at the University of Paris. This paper will examine the university documents and manuscript commentary side-by-side, and show how the university lecturers retained the formal Aristotelian elements of the commentary for public consumption (during graduation ceremonies), while editing out the names of many contemporary writers and their controversial ideas. It will argue that scientific education at the University of Edinburgh was a sophisticated, sceptical, and cautiously progressive one, based upon a fusion of scholastic, humanist, Ramist, and Clavian philosophies.

Weds 3:00-4:45, PS 3: “Monsters and Men (I).”

Ivana Bičak (Durham), “This new knack of transfusion: The Early Royal Society, blood transfusion experiments, and satire.” In 1667, the Royal Society offered money to a mentally challenged alcoholic to take part in a dangerous transfusion of sheep’s blood. The experiment attracted the attention of the general public, which resulted in excited coffee house banter and broadside ballads. While most of this material is now lost, there survives a manuscript poem in the British Library on the episode. The poem, ‘On Agnus Coga his Povertie’ (ca. 1668), tackles crucial bioethical questions in a period that knew no concept of bioethics. Is the exchange of blood between humans and animals an ungodly act, a re-engineering of a human being made in God’s image? From which social categories should human subjects be selected for these experiments? Are these persons capable of giving consent? The poem deals with the problems of scientific exploitation, complicity, and informed consent through the use of realised metaphors, local legends, and classical mythology. This paper argues that the poem acts as a site of transformations, both rhetorical and literal. The practice of transfusion transforms poetry itself, and influences the choice of poetic devices. Simultaneously, the poem’s humour serves as a powerful weapon in the incrimination of the new experimental procedure.

Danielle Mead Skjelver (Maryland), “François Hédelin’s *Des satyres, brutes, monstres et démons*: Beyond the edges of humanity.” From Paracelsus to Jonathan Swift, early modern thinkers sought to define clearly the boundaries of the human. This was not so much a discourse on inclusion as exclusion. Its scope ranged from teratological studies of abnormalities in human neonates to cosmographical illustrations of Pliny’s monstrous races to travelers’ accounts of unfamiliar behavior, appearance, and customs among non-Europeans. All asked the question: Are they human? And thus: What differentiates human from animal? What makes a human monster a monster? And if a monster, can a monster be human? Thirty years before publishing his highly influential *La pratique du théâtre*, François Hédelin, the future Abbé d’Aubignac, grappled with these questions in *Des satyres, brutes, monstres et démons*. This paper situates Hédelin’s first published work in the intellectual context of its day. Never doubting their existence, Hédelin asks: What are satyrs? Wanton in their displays of masculine excess in all its threatening potential, satyrs repulsed the pious, orderly young scholar. Drawing on the same characteristics of many of his contemporaries to define what was human, Hédelin set out to exclude satyrs unequivocally from the descendants of Adam.

Erin Webster (William and Mary), “‘How now, moon-calf!’: Imagining lunar beings in Shakespeare’s *Tempest*.” Shakespeare’s Caliban is given many labels by the shipwrecked Europeans who wash up on his island, including “whelp,” “tortoise,” “hag-seed,” “fish,” and “monster.” Of these various denigratory appellations, one of the strangest is surely that of “moon-calf,” a term usually glossed as meaning simply monstrous or deformed. In this paper I argue that, on the contrary, Caliban’s association with the moon has a more specific source in Galileo’s *Sidereus Nuncius*, published just prior to *The Tempest*’s composition in 1610-11. Galileo’s telescopic revelation of an “earth-like” moon in this work led many to style him as a cosmological Columbus, discovering a new world in space for which the Americas acted as an imaginative analogue. In associating Caliban with the moon and with lunar creatures more specifically, Shakespeare connects the celestial and terrestrial “new worlds” of his time while also inviting us to reconsider the scope of Europe’s colonizing impulse.

Weds 3:00-4:45, PS 4: “Scientific Exchange with Europe in the Ottoman Empire and Iran.”

Robert Morrison: As scholars of science in Islamic societies work on later centuries, we have uncovered more and more evidence of cross-cultural exchange, particularly with Europe.

Robert Morrison (Bowdoin), “Astrology and Averroism in the works of Moses Galeano (d. after 1542).” A scholarly network, composed heavily of Romaniot and Sephardic Jews, bridged the Veneto, Crete, and Istanbul during the late fifteenth and early sixteenth centuries. Qabbalah and theoretical astronomy, fields in which Sephardic Jews made foundational contributions, were central concerns. Though Averroes was Muslim, his philosophy became of particularly wide-ranging importance for Jewish and Christian members of the network in two ways. First, Averroes’s theory of the unity of the intellect competed with the Qabbalistic theory of metempsychosis. Second, because Averroist philosophy rejected emanation, everything that occurred in nature occurred as a result of God’s moving the outermost orb of the cosmos. My earlier research has shown that this scholarly network was important for the scholarly exchange of theoretical astronomy from Islamic societies that reappeared in the work of Renaissance astronomers. Astronomy that agreed with Averroes’s philosophy was an important part of that exchange. This presentation provides a glimpse, then, into how that exchange of information about theoretical astronomy was part of a larger conversation that centered on judicial astrology and Averroist philosophy.

Salim Aydüz (Manchester), “Sultan Mehmed II, his contemporary scholars and their respective roles in the advancement of Ottoman science.” Scientific studies encouraged and supported by Ottoman sultans and statesmen peaked in the reign of Mehmed II. While he was embracing Turkish and Muslim scholars from the East and the Muslim world, he was at the same time inviting to his capital Western scholars and artists. The Topkapi Palace library owns over fifty scholarly books on Western civilization which were once part of Mehmed II’s personal library. He also invited scholars from Turkic-Muslim countries, the most distinguished of them being Ali Kuşçu, who was at the time the chief scientist in the Samarkand Observatory. Kara Sinan, Shaikh Wafa, Hocazade and Ala al-Din al-Tusi, all eminent scholars of astronomy and mathematics, were also active during the reign of Mehmed II. Sharaf al-Din Sabuncuoğlu and his book in the field of medicine are also worthy of mention; likewise Mas’ud b. Hakim al-Din al-Jilani and Muhammad b. Yusuf al-Ilaki. In this paper, we will analyse their books and their relationship with Mehmed II to reveal their contribution to Ottoman Science.

Amir-Mohammad Gamini and Reza Aghaei (Tehran), “Reception of early modern European astronomy by Iranian religious élites.” Iranians received European early modern science at the beginning of the 19th century. One of the first records of rejection of modern astronomy appears in Mahdī Narāqī’s *Al-Muṣṭaqṣā* (before 1829). Although Narāqī was a religious scholar from the main stream of Shiite ulama, his refutation was based on experimental arguments. Muḥammad-Ḥussayn Shahrastānī is another religious scholar from ulama who in his *Āyāt Bayyināt (The Clear Signs - 1881)* believes that though the new cosmology is in absolute contradiction with ancient philosophy and there is no rational proof for it, the Islamic discourses are neutral in relation to this theory. The opponents of the modern astronomy were more among religious heretics of those times: the Shaykhists and the Gunābādī Sufists. KarīmKhān Kirmānī (1810-1871), the leader of the Shaykhism, and his followers, among them Muḥammad -Bāqir Hamadānī and Zayn al-Ābidīn Kirmānī, published some texts criticizing the theory of the motion of the Earth, based on natural philosophical point of view as well as religious discourses. NūrālīShāh Thānī (1867-1918), the leader of Gunābādī Sufism, in his *Najd al-Hidāya* (1901), criticizes the heliocentric cosmology also based on philosophical teachings.

Weds 5:15-7:15, Plenary session.

Panel led by Subha Mukherji (Cambridge): “Ways of Knowing.”

Anupam Basu (Washington), “Knowledge domains within the early modern printed corpus.”

The scale of the EEBO-TCP corpus, which aims to digitize at least one edition of everything printed in English before 1700, challenges us to rethink the ways in which we work with the early modern printed record. By posing the methodological question of how a scalable, corpus based approach conceptualizes the relationship between texts, this paper will explore new ways of thinking about knowledge domains and regimes..

Sorana Corneanu (Bucharest), “Reason and emotion in Robert Boyle’s moral and natural religious thought.”

The paper looks at one important and hitherto neglected thread linking Boyle’s early moralist phase with his later natural religious thought: the presentation of knowledge as a cognitive-affective practice. I aim to trace the development of this topic from Boyle’s early conception of persuasive argument, through his theological anthropology, to the mature conception of natural religion as a set of acts that combine knowledge and affection.

Torrance Kirby (McGill), “A Form of the forms of knowing: Richard Hooker’s sapiential theology.”

According to Richard Hooker the ways of Wisdom are “of sundrie kindes, so her maner of teaching is not meere one and the same.” With echoes of the Wisdom theology of the Hebrew Scriptures in his treatise *Of the Lawes of Ecclesiastical Politie* (1593), Hooker frames his apologetic in defence of the Elizabethan religious settlement by laying out a detailed scheme of diverse forms of knowing, the highest of which is actually a form of ‘unknowing’. The architecture of these “sundrie kindes” of knowing harks back to the *processio-redditus* cosmology of Proclus and Pseudo-Dionysius.

Subha Mukherji, “In wandering mazes lost: The Labyrinth as epistemic metaphor.”

This paper will invoke the labyrinth as a discursive metaphor for ways of knowing across early modern epistemic domains to reflect on how formal inflections and investments determine the ethics, aesthetics and affect of knowing.