

RESEARCH ARTICLE

Medicine and the heavens in Padua's Faculty of Arts, 1570–1630

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Abstract

In the faculty of arts at the University of Padua in the years around 1600 professors debated the reliability of astrology, the existence of occult celestial influences, and the idea that celestial heat is present in living bodies. From the 1570s to the 1620s many professors in the faculty of arts pushed back against astrology and Jean Fernel's theories surrounding astral body. Girolamo Mercuriale, Alessandro Massaria and Eustachio Rudio thought that some forms of astral causation and Fernel's ideas were incompatible with their observations of disease, Aristotle's philosophy and Hippocratic theories. Later, Santorio Santorio and Cesare Cremonini, who were allied to the political circle of Paolo Sarpi, polemicized against astrology. Their writings show that at Padua medical theory was linked to Aristotelian cosmology, which emphasized the incommensurability between celestial and terrestrial elements. Their rejection of astrology, however, did not lead to the complete marginalization of astrology at Padua. By the middle of the 1620s, as the political climate changed in Venice, the University of Padua hired professors who promoted astrology and Fernel's theories about the celestial nature of innate heat. The diversity of opinions about astrology reflected Venice's divided politics and multiple approaches to interpreting Aristotle and other authorities.

During the sixteenth and seventeenth centuries, the faculty of arts at the Studio of Padua was, for the most part, dedicated to and organized around teaching medicine.¹ Padua's renown in and focus on medicine, the result of a long tradition going back to the Middle Ages, was reflected in its statutes and institutional structure.² By the late sixteenth century, there were at least twelve chairs of medicine, but just five for natural philosophy and one for mathematics. A similar curriculum held in the 1620s.³ Professors of medicine sat at the top of the hierarchy. While Galileo's salary eventually reached a thousand florins, it was still below the annual payments of 1,400 florins made to the professor of medicine Girolamo Fabrici d'Acquapendente. Galileo's initially salary of 180 florins was a

¹ Paul F. Grendler, *The Universities of the Italian Renaissance*, Baltimore: Johns Hopkins University Press, 2002, pp. 334–52; Jerome L. Bylebyl, 'The school of Padua: humanistic medicine in the sixteenth century', in Charles Webster (ed.), *Health, Medicine and Mortality in the Sixteenth Century*, Cambridge: Cambridge University Press, 1979, pp. 335–70.

² Bylebyl, op. cit. (1), p. 337.

³ Giacomo Filippo Tomasini, *Gymnasium patavinum*, Udine, 1654, pp. 291–340. For the curriculum of 1623–4 see Giovanni Camillo Gloriosi, *Responsio ad vindicias Bartholomaei Soveri*, Naples, 1630, pp. 75–9.

fraction of what even low-ranked professors of medicine earned.⁴ This institutional structure, coupled with the students' professional goals, meant that teaching cosmology and astronomy was often subordinate to medical instruction.

Numerous historians have linked philosophy's propaedeutic relation to medicine at Padua as crucial to understanding the theories of nature promoted there. Charles Schmitt implored scholars to consider the Aristotelianism of sixteenth-century universities as part of medical education.⁵ It is well demonstrated that Aristotelian natural philosophy influenced Paduan projects on comparative anatomy, and philosophy's relation to medicine is visible in commentaries and lectures on Aristotle's *De anima*, *De partibus animalium*, *Meteorologica* IV, and *Parva naturalia*.⁶ The connections between medicine and natural philosophy extend to cosmological theories as well. Antonio Favaro, in his discussion of Galileo's teaching at Padua, saw connections between medicine and astronomy. He wrote that 'some notions of astronomy were necessary, or rather indispensable to physicians', leaving us to ask 'what notions?' and 'why were they indispensable?'⁷

The answer to these questions relates to debates about celestial influence on health and on the human body and astrology's role in medical prognostication. Frequently, in the years around the turn of seventeenth century, professors at Padua, both of medicine and of philosophy, polemicized against the views of Jean Fernel, largely seeing his ideas about celestial influence and astral body as incompatible with Aristotle, Hippocrates and Galen and with observations of disease. By the first decades of the seventeenth century, prominent professors, such as Cesare Cremonini and Santorio Santorio, endorsed Giovanni Pico della Mirandola's views about astral causation, namely that heavenly bodies affect the sublunary realm only through light and motion and not through occult influences. Cremonini and Santorio, along with many of their colleagues, used this position to cast doubt about the applicability of astrology and astral causation to medical theory and practice. The rejection and limitation of astrological teachings, although widespread in the faculty of arts of Padua during the years from 1570 to 1630, need not be considered part of a unidirectional marginalization of astrology. As the political climate in Venice changed in the 1620s, newly hired professors endorsed Fernel's doctrines and the application of astrology to medicine, leading to its reestablishment at Padua.

Celestial medicine

Even if the curriculum at Padua included natural-philosophical courses based on Aristotle's *De caelo* and courses on astronomy taught by mathematicians, most students did not study philosophy to become philosophers or astronomy to become astronomers. Although a few students might have later taught philosophy or astronomy or practised astrology, students in the faculty of arts at Padua generally intended to practise medicine.

⁴ Galileo Galilei, *Dal carteggio e dai documenti* (ed. Isidoro Del Lungo and Antonio Favaro), Florence: Sansoni, 1968, p. 13; Grendler, op. cit. (1), p. 335.

⁵ Charles B. Schmitt, 'Aristotle among the physicians', in Andrew Wear, Roger French and Iain M. Lonie (eds.), *The Medical Renaissance of the Sixteenth Century*, Cambridge: Cambridge University Press, 1985, pp. 1–15. For Aristotelian commentaries see Charles H. Lohr, *Latin Aristotle Commentaries*, vol. 2: *Renaissance Authors*, Florence: Olschki, 1988.

⁶ For Aristotle and medicine at Padua see Andrew Cunningham, 'Fabricius and the "Aristotle Project" in anatomical teaching and research at Padua', in Wear, French and Lonie, op. cit. (5), pp. 195–222; Tawrin Baker, 'Why all this jelly? Jacopo Zabarella and Hieronymus Fabricius ab Acquapendente on the usefulness of the vitreous humor', in Peter Distelzweig, Benjamin Goldberg and Evan R. Ragland (eds.), *Early Modern Medicine and Natural Philosophy*, Dordrecht: Springer, 2016, pp. 59–88; Simone de Angelis, 'From text to the body: commentaries on *De Anima*, anatomical practice and authority around 1600', in Emidio Campi, Simone De Angelis, Anja-Silvia Goeing and Anthony T. Grafton (eds.), *Scholarly Knowledge: Textbooks in Early Modern Europe*, Geneva: Droz, 2008, pp. 205–27.

⁷ Antonio Favaro, *Galileo Galilei e lo Studio di Padova*, Padua: Antenore, 1966, p. 113.

Documents from the German Nation, the largest group of foreign students, show their predominant interest in medicine. They donated far more books on medical topics than any other to the nation's library.⁸ If the books donated by students of the faculty of art to the nation accurately reflect the students' interests, then astronomy and mathematics rank low. In the years from 1591 to 1615, only a few copies of Christopher Clavius's arithmetical works were part of the collection, and no copies of his commentary on Sacrobosco's *Sphere*; Tycho Brahe's writings are named just once; and Ptolemy's works are represented by a single copy of Regiomontanus's epitome.⁹ The lists of books suggest that the students of the German Nation spent far more time reading medical and philosophical writings, and even Aesop and Boccaccio, than they did about astronomy. The German Nation's acts do not mention Galileo even once in the years that he taught there, despite often naming other prominent professors like Cesare Cremonini and Girolamo Fabrici d'Acquapendente.

Nevertheless, professors of medicine and physicians considered understandings of the nature of the heavens to play an important role in their field, especially as they increasingly defined medicine as part of natural philosophy. Girolamo Donzellini, a physician from Brescia who had studied at Padua before practising medicine in Venice, gave an overview of the connections between cosmology and medicine. He likened medical knowledge to philosophical knowledge in the introduction to the *Consilia* (1559) of Giambattista Da Monte, who taught at Padua from 1539 to 1551. Donzellini wrote, 'whatever is contained in this corporeal mass of the universe, it falls underneath its [medicine's] study so that, besides the celestial and incorporeal minds, whatever is enclosed within the fullest spaces and borders of nature, everything relates to the art of medicine'.¹⁰ Physicians, just like philosophers, must grasp Aristotle's four terrestrial elements and the celestial ether. Precise knowledge of the paths of stars and planets allows for forecasting changes in the air, which as one of the six non-naturals was believed to affect health. Donzellini noted that, in Galen's view, 'heavenly powers' produce the 'constitution of air'.¹¹ He pointed to the doctrine of critical days, the theory that diseases, especially fevers, come to a crisis on an arithmetically regular basis. Galen had linked these days, which were first theorized in the Hippocratic corpus, to the phases of the moon, and medieval physicians had developed elaborate astrological interpretations of Galen's theory.¹²

Donzellini, while imploring physicians to study the motions of the sun, moon and stars, expressed ambivalence toward astrology. He wrote that Galen 'was not strongly bound to astrology and was able to uphold Hippocrates' opinion, using just the motions of the moon and its various aspects with the sun' for the theory of critical days. He concluded in ecumenical fashion, 'at least astronomy, if not astrology, is absolutely essential to the physician'.¹³ Donzellini's description corresponds to the shifting views of professors of

⁸ Nancy G. Siraisi, *Avicenna in Renaissance Italy: The Canon and Medical Teaching in Italian Universities after 1500*, Princeton, NJ: Princeton University Press, 1987, pp. 108–9. For the aspirations of Polish and English students at Padua see Valentina Lepri, *Knowledge Transfer and the Early Modern University: Statecraft and Philosophy at the Akademia Zamojska (1595–1627)*, Leiden: Brill, 2019, pp. 72–7; Jonathan Woolfson, *Padua and the Tudors: English Students in Italy, 1485–1603*, Toronto: University of Toronto Press, 1998, pp. 87–90.

⁹ *Atti della nazione germanica artista nello Studio di Padova*, vol. 2 (ed. Antonio Favaro), Venice: R. Deputazione Veneta di Storia Patria, 1912, pp. 132, 185, 190, 312.

¹⁰ Giambattista Da Monte, *Consilia medica omnia* (ed. Girolamo Donzellini), Nuremberg, 1559, sig. a4r: 'quidquid tamen corporea hac universi mole continetur, eius subiacet cognitioni, ut praeter coelestes ac incorporeas mentes, quaecunque amplissimis naturae spaciis ac finibus clauduntur, omnia medicam artem attingant'.

¹¹ Da Monte, op. cit. (10), sig. a4r.

¹² Concetta Pennuto, 'The debate on critical days in Renaissance Italy', in Anna Akasoy, Charles Burnett and Ronit Yoeli-Tlalim, *Astro-Medicine: Astrology and Medicine, East and West*, Florence: SISMEL, 2008, pp. 75–98.

¹³ Da Monte, op. cit. (10), sig. a4r: 'is recte iudicabit, qui Galenum, astrologiae alioqui non valde addictum, non aliter Hippocratis sententiam, quam ex lunae motibus et variis eius cum sole aspectibus, tueri potuisse intelligit'; 'si non astrologiam, at saltem astronomiam medico esse pernecessariam'.

medicine at Padua. In the fourteenth and fifteenth centuries, astrology formed a significant part of medical instruction in Padua and elsewhere in northern Italy, as physicians used it for making decisions about cures, prognosticating the course of diseases and predicting epidemic disease.¹⁴ By the middle of the sixteenth century, like Donzellini, many professors at Padua took a questioning, if not sceptical, approach.

An ambivalent attitude can be found already in the 1540s, when Giambattista Da Monte endorsed astrology in his lectures on Avicenna's *Canon*, urging his students to learn the field to understand how the heavens alter the air and human bodies.¹⁵ Yet he never applied the field in printed records of consultations. Moreover, in a consultation made by the College of Physicians of Padua for an outbreak of epidemic disease in 1541, which was included in a collection of Da Monte's consultations, the college rejected an astrological diagnosis, arguing that 'Hippocrates, Galen and Aristotle do not seem to concede that there are those occult influences of the stars, but this air only changes from the light and motion of the heaven', an argument in line with Giovanni Pico della Mirandola's critiques of astrology.¹⁶ Pico limited the heavens' active powers to motion and light and stated that astrologers' theories contradicted Hippocrates' and Aristotle's teachings.¹⁷ The college contended that the profile of the epidemic was inconsistent with an astral origin for the disease, arguing that, since nearby towns that were presumably under the same stars were unscathed by the epidemic, the cause must be local rather than universal. Thus the college employed philological analyses of ancient writers, critiques of the physics of astral causation and first-hand observations of the disease.

In the following decades, many medical theorists at Padua adopted humanistic approaches that emphasized literal readings of ancient sources that cast doubt on the textual authority for astrology and astral causation. Throughout the sixteenth century and into the seventeenth, the University of Padua's statutes required lecturers to expound authoritative texts – such as those by Aristotle, Galen, Hippocrates and Avicenna – word for word.¹⁸ Professors and students alike endorsed this method of instruction. Alessandro Massaria, a professor of medicine, attacked the use of textbooks instead of commentaries.¹⁹ In 1591, student leaders influenced by the philosopher Cesare Cremonini objected that teachers in the newly founded Jesuit college were using

¹⁴ Nancy G. Siraisi, *Arts and Sciences at Padua: The Studium of Padua before 1350*, Toronto: Pontifical Institute of Mediaeval Studies, 1973, pp. 77–94; Monica Azzolini, *The Duke and the Stars: Astrology and Politics in Renaissance Milan*, Cambridge, MA: Harvard University Press, 2013, pp. 26–42; H Darrel Rutkin, *Sapientia Astrologica: Astrology, Magic and Natural Knowledge, ca. 1250–1800. I Medieval Structures (1250–1500): Conceptual, Institutional, Socio-political, Theologico-religious and Cultural*, Cham: Springer, 2019, pp. 407–15. Rutkin, op. cit., p. lxxviii, contends that the modern distinction between natural and judicial astrology was not present in the fifteenth century and that medical astrology was judicial in the sense that it made judgements about the future. It is not a distinction emphasized in the texts discussed in this article.

¹⁵ Giambattista Da Monte, *In primam fen primi Canonis Avicennae explanatio*, Venice, 1554, fol. 32v–35r; Da Monte, *Lectiones in secundam fen primi Canonis Avicennae*, Venice, 1557, pp. 794–5.

¹⁶ Giambattista Da Monte, *Consultationes medicae*, Basel, 1583, col. 1114: 'Primum quidem occultos illos siderum influxus non videntur Hipp. Gal. Aristotelesque concedere, sed tantummodo aerem hunc a coelo per lumen & motum ad frigidum, calidum, & siccum immutari, atque his primis qualitatibus intervenientibus reliquos deinde omnes effectus producere'.

¹⁷ Giovanni Pico della Mirandola, *Disputationes adversus astrologiam divinatricem*, vol. 1 (ed. Eugenio Garin), Florence: Vallecchi, 1946, pp. 194–208, 334–6; Ovanes Akopyan, *Debating the Stars in the Italian Renaissance*, Leiden: Brill, 2021, pp. 116–19; Steven Vanden Broecke, *The Limits of Influence: Pico, Louvain, and the Crisis of Renaissance Astrology*, Leiden: Brill, 2003, pp. 66–71.

¹⁸ *Statuta almae universitatis D. artistarum et medicorum patavini gymnasii*, Padua, 1589, pp. 67–8; *Statuta almae universitatis DD. philosophorum, et medicorum, cognomento artistarum patavini gymnasii*, Padua: 1607, p. 161.

¹⁹ Antonio Riccobono, *De gymnasio patavino*, Padua, 1598, fol. 71r.

summaries instead of teaching Aristotle's works directly.²⁰ Lecturers, however, relied on more than their philological expertise. They integrated their readings with observations of bodies and disease, as they interrogated and questioned the role of celestial influences and the presence of celestial matter in the sublunary world.

Two cosmological doctrines provoked controversy: the identification of vital innate heat with celestial heat and the role of celestial influences in the development of illness. The second doctrine was closely related to astrological predictions and explanations of disease. Traditional physiology received several challenges during the first half of the sixteenth century. Among the most influential innovators was the French medical theorist Jean Fernel. Influenced by Marsilio Ficino, Fernel attempted to reconcile Plato, Aristotle, Galen and Christianity. He contended that the heavens govern the world by transmitting their form through a cosmic spirit throughout the universe. Downplaying Galen's naturalizing tendencies and understanding this cosmic spirit to be distinct from the elemental temperament of sublunary beings, Fernel postulated that living beings' vital or innate heat is a celestial heat that differs from fire's elemental heat. His identification of the innate and celestial heat had precedents in medieval theorists, such as Pietro d'Abano, who in turn had been attacked by medical humanists. At the turn of the sixteenth century, Niccolò Leonicensino criticized the medieval tradition's linking celestial to innate heat, a view he considered to be derived from a misinterpretation of Aristotle. Instead, he argued that the vital heat contained in human seed is not identical with but only analogous to celestial heat.²¹ Against Leonicensino, Fernel posited other connections between the heavens and the body in addition to his ideas about astral bodies in human physiology.²² Significantly, he theorized that occult malignant qualities sent down from the heavens cause pestilences.²³ Fernel was not alone in his views about astral bodies. For example, Girolamo Cardano endorsed the idea that celestial heat, equivalent to the world-soul, forms souls, a theory that Julius Caesar Scaliger rejected because he denied the ability of the heavens to generate in the sublunary realm, except in cases of spontaneous generation.²⁴

Cardano's and especially Fernel's theories convinced some at Padua but increasingly provoked doubts because they were seen as incompatible with close readings of Aristotle and Galen or with observations of the course of epidemics. Fernel's attempted reconciliation of Aristotle, Galen, Plato and Christian theology employed the Pseudo-Aristotelian *De mundo*, which by the 1550s was judged to be inauthentic, and other texts and passages no longer considered to be genuinely part of the Aristotelian, Hippocratic and Galenic corpora.²⁵ Some early critics of Fernel, such as Joachim Cureus,

²⁰ Grendler, op. cit. (1), pp. 123–4.

²¹ Hiro Hirai, 'The new astral medicine', in Brendan Dooley (ed.), *A Companion to Astrology in the Renaissance*, Leiden: Brill, 2014, pp. 267–86, 269–70; Hirai, 'Formative power, soul and intellect in Nicolò Leonicensino', in Paul J.J.M. Bakker, Sander W. de Boer and Cees Leijenhorst (eds.), *Psychology and the Other Disciplines: A Case of Cross-disciplinary Interaction (1250–1750)*, Leiden: Brill, 2012, pp. 297–324, 303–12.

²² D.P. Walker, 'The astral body in Renaissance medicine', *Journal of the Warburg and Courtauld Institutes* (1958) 21 (1–2), pp. 119–33.

²³ Jean Fernel, *On the Hidden Causes of Things: Forms, Souls and Occult Diseases in Renaissance Medicine* (tr. John M. Forrester and John Henry), Leiden: Brill, 2005, p. 574. Elisabeth Moreau, 'Pestilence in Renaissance Platonic medicine: from astral causation to pharmacology and treatment', in Fabio Zampieri and Fabrizio Baldassarri (eds.), *Scientiae in the History of Medicine*, Rome: L'Erma di Bretschneider, 2021, pp. 217–46.

²⁴ Jonathan Regier, 'A hot mess: Girolamo Cardano, the Inquisition, and the soul', *HOPPOS: The Journal of the International Society for the History of Philosophy of Science* (2021) 11(2), pp. 547–63; Kuni Sakamoto, *Julius Caesar Scaliger, Renaissance Reformer of Aristotelianism: A Study of His Exotericae Exercitationes*, Leiden: Brill, 2016, pp. 37–44.

²⁵ John Henry, 'Jean Fernel on celestial influences and the reform of medical theory', in Dario Tessicini and Patrick Boner (eds.), *Celestial Novelties on the Eve of the Scientific Revolution 1540–1630*, Florence: Olschki, 2012,

believed that his views about astral body were inconsistent with Aristotle's theory of an eternal, uncorruptible, heavenly element that is distinct from terrestrial bodies.²⁶ Cureus had studied at Padua under the philosopher Marco Antonio Genua (1491–1563), whom he credited with teaching the genuine philosophy of Aristotle.²⁷ Genua dismissed the idea that the natural heat of semen is proportional to celestial heat as being incompatible with Aristotle's teachings.²⁸

Nevertheless, several professors of medicine at Padua endorsed at least parts of Fernel's theories. For example, the professor of theoretical medicine from 1563 to 1592, Bernardino Paterno, in the written version of his lectures on Avicenna's *Canon*, maintained that human bodies contain spirits that have the same nature as the celestial ether, which differentiate living bodies from inanimate ones.²⁹ Fernel's ideas influenced Girolamo Mercuriale, who taught practical medicine at Padua from 1569 to 1587. His treatise on pestilence, based on lectures given in January of 1577, was written in the aftermath of his failed diagnosis of plague that struck Venice and Padua from 1575 to 1577.³⁰ Mercuriale contended that plague resulted from the corruption of the substance of ambient air. In his view, the resulting intemperance of the air occurs in two different ways. Exhalations or winds can corrupt the mixture of air; or, plagues can arise from an occult quality that derives from celestial forms, as the air inflicts the disease through malignant heavenly qualities.³¹ Mercuriale, nevertheless, distinguished his position from Fernel's, who held that an occult quality is the sole cause of pestilences, while Mercuriale recognized that plagues can originate from multiple causes.³²

Mercuriale's understanding of plague had been subjected to criticism when he failed to diagnose the Venetian outbreak, contending that it was not truly plague but merely a malign fever. In the following decade, while reviving his reputation, he embarked on series of analyses of Hippocratic writings that combined philological erudition with practical medical knowledge. These analyses formed the material for lectures given at Padua. In Mercuriale's view, given the authoritativeness of Hippocrates, these philological investigations had ramifications for contemporary medical theory and practice. Moreover, philological practices and the cultivation of humanistic culture were tools that students could later apply in their practice and in their self-fashioning, in part to distinguish themselves from other kinds of practitioner and in part to situate themselves in a society that prized humanist erudition.³³ The census of printings of Vesalius's *Fabrica* has shown that someone present in Padua in the 1570s annotated his copy with citations of Aristotle, Hippocrates, Galen, Gabriele Falloppio and Da Monte, demonstrating the persistent application of humanistic reading practices similar to those that Mercuriale encouraged his students to use.³⁴

pp. 133–57; Hiro Hirai, *Medical Humanism and Natural Philosophy: Renaissance Debates on Matter, Life and the Soul*, Leiden: Brill, 2011, pp. 46–79; Jill Kraye, 'Aristotle's God and the authenticity of *De mundo*: an early modern controversy', *Journal of the History of Philosophy* (1990) 28(3), pp. 338–58.

²⁶ Walker, op. cit. (22), pp. 127–30.

²⁷ Joachim Cureus, *Περὶ αἰθέρσεως, καὶ αἰθητῶν libellus physicus*, Wittenberg, 1572, fol. b2v: 'meus praeceptor M. Antonius Passerus Genuensis, de quo universa sibi persuaserat Italia, Aristotelem per ipsum germanam suam Philosophiam sonare'.

²⁸ Marco Antonio Genua, *In tres libros Aristotelis de anima exactissimi commentarii*, Venice, 1576, fol. 183r.

²⁹ Bernardino Paterno, *Explanationes in primam fen primi Canonis Avicennae*, Venice, 1596, p. 55.

³⁰ Richard Palmer, 'Girolamo Mercuriale and the plague of Venice', in Alessandro Arcangeli and Vivian Nutton (eds.), *Girolamo Mercuriale, medicina e cultura nell'Europa del Cinquecento*, Florence: Olschki, 2008, pp. 51–65.

³¹ Girolamo Mercuriale, *De pestilentia*, Venice, 1577, pp. 18–22.

³² Mercuriale, op. cit. (31), p. 26.

³³ Sarah Gwyneth Ross, *Everyday Renaissances: The Quest for Cultural Legitimacy in Venice*, Cambridge, MA: Harvard University Press, 2016, pp. 81–166.

³⁴ Dániel Margócsy, Stephen N. Joffe and Mark Somos, *The Fabrica of Andreas Vesalius: A Worldwide Descriptive Census, Ownership, and Annotations of the 1543 and 1555 Editions*, Leiden: Brill, 2018, p. 98; Richard J. Durling, 'Girolamo Mercuriale's *De modo studendi*', *Osiris*, 2nd series (1990) 6, pp. 181–95.

In lectures Mercuriale gave on the *Aphorisms*, he questioned astrological interpretations of the doctrine of critical days and expressed scepticism over Hippocrates' supposed endorsement of celestial influences, seemingly revising his earlier views about the causes of plagues.³⁵ Mercuriale used *Aphorisms* 3.1, which associates the changing of seasons with the arrival of disease, to argue that when Hippocrates referred to the heavens he meant 'not so much the stars as the quality of the air itself', which can alter through the powers of hot and cold and by changes in the weather brought by winds and other aerial disturbances.³⁶ The aspect and influence (*influxus*) of the heavens cause the seasons, which in turn affect the air and human bodies. Therefore, in his interpretation, astral powers had a limited role in Hippocrates' medicine. He wrote, 'as for what pertains to the stars, Hippocrates always disdained those, and did not barely mention any other celestial body besides the great changes [of the season]'.³⁷ Mercuriale's scepticism toward celestial influence reappeared in his discussion of critical days. He wrote that he had never liked that many believed the days were 'educated from the stars', when in fact they were formulated based on 'lengthy and careful observations'. For this reason, he conceded that Pico della Mirandola correctly opposed astrologers on this question.³⁸

Among the next generation of professors of medicine at Padua, doubts about celestial influence and heat grew, as is visible in reactions to Mercuriale's handling of the plague. Numerous observers, who promoted person-to-person contagion rather than putrefied air as the cause of the plague, objected to astrological explanations for the epidemic.³⁹ Alessandro Massaria was among Mercuriale's critics, and, after Mercuriale left Padua for Bologna, Massaria took the vacated position. In a plague treatise printed in 1579, Massaria endorsed several of Pico's arguments against astral causation. He argued that celestial bodies influence only by light and motion and that astrologers had adopted a forced and inaccurate reading of Galen when they maintained the existence of occult celestial influences. In Massaria's view, not just Galen but also Aristotle, Averroes and all Peripatetics rejected that celestial bodies, composed of unchanging ether, could have qualities or properties that harm or help. Therefore those like Fernel who maintained that the heavens caused plagues through occult powers must be refuted.⁴⁰

Massaria continued to question astral causation and the astral body after he became professor of practical medicine at Padua in 1587. His inaugural oration criticized Fernel for supposedly misinterpreting Aristotle, Hippocrates and Galen.⁴¹ Massaria's textbook on practical medicine argued that considerations of the heavens surpass the boundaries of the field of medicine. He wrote that since manifest causes are proven to explain the periodicity of fevers, 'it is superfluous to take refuge in the moon and the stars' and

³⁵ Concetta Pennuto, 'Girolamo Mercuriale e la dottrina dei giorni critici', in Arcangeli and Nutton, op. cit. (30), pp. 301–17.

³⁶ Girolamo Mercuriale, *In omnes Hippocratis Aphorismorum libros praelectiones patavinae*, Bologna, 1619, p. 210: 'pro caelestibus accipiens non tantum sydera, quantum ipsius aeris qualitates'.

³⁷ Mercuriale, op. cit. (36), p. 316: 'Cui respondendum est, quod pertinet ad astra, Hippocratem semper ea fuisse aspernatum, nec fere alterius celestis rei meminisse, quam magnarum mutationum'.

³⁸ Mercuriale, op. cit. (36), p. 125: 'licet autem conati sint plerique horum omnium vim, atque rationem ab astris deducere, nihilominus semper mihi placuit, potius haec fuisse excogitata longis, & accuratis observationibus, quam ulla alia ratione'.

³⁹ Samuel K. Cohn Jr, *Cultures of Plague: Medical Thinking at the End of the Renaissance*, Oxford: Oxford University Press, 2010, pp. 195–200.

⁴⁰ Alessandro Massaria, *De peste*, Venice, 1579, fol. 17r–17v.

⁴¹ Riccobono, op. cit. (19), fol. 71r; Nancy G. Siraisi, 'Giovanni Argenterio and sixteenth-century medical innovation: between princely patronage and academic controversy', *Osiris*, 2nd series (1990) 6, pp. 161–80, 161–2.

that it is 'stupid' to rely on occult proprieties, when Hippocrates did not investigate any causes beyond the hot, cold, wet and dry.⁴²

Views like Massaria's pervaded Padua. Eustachio Rudio, who taught practical medicine at Padua from 1599 to 1612, after expounding an explicitly astrological version of critical days, concluded that searching for the remote and celestial causes of critical days is futile. Rather, the cycles are linked to the nature, qualities and faculties of bodily matter.⁴³ Elsewhere, Rudio argued that according to Aristotle only light, and no other celestial or solar influence, affects living beings, as he criticized Fernel.⁴⁴ Prospero Alpino, who taught at Padua from 1593 to 1617, speculated on critical days without endorsing a particular theory, citing numerology, astrology, harmonic consonances and the nature of the humours as potential explanations for them.⁴⁵ Giovanni Tommaso Minadoi, professor of practical medicine from 1596 to 1615, counted himself among a longer tradition, which included his predecessors at Padua, Vittore Trincavelli and Girolamo Capodivacca, that taught that the periodicity of fevers should be investigated in relation to the qualities and processes within the body and its humours rather than through the universal causes of the heavens, a view that resonates with arguments Girolamo Fracastoro had put forward.⁴⁶ Orazio Augenio, who taught theoretical medicine from 1592 to 1603, dismissed Saturn as the cause of births in the eighth month of pregnancy, a view he credited to astrologers. Despite having endorsed astrology in letter written in 1570, in a treatise printed in 1595 Augenio wrote that his observations suggested that even if the heavens are in a good position, if one of the parents is ill with an infectious or hereditary disease, the child will be born diseased. He concluded that we cannot know anything certain about particular effects from the universal causes of the stars. Moreover, in his eyes, astrologers' views about premature birth were incompatible with Aristotle's teachings because they relied not just on motion and light but also on other influences.⁴⁷

Santorio and Cremonini

By the first decade of the seventeenth century, Paduan professors of medicine largely agreed that considerations of astral causation should be limited, while doubting the usefulness of astrological prognoses. These views resonated with philosophers and physicians, as is evident in the development of these ideas by Santorio Santorio and Cesare Cremonini. Santorio, a student of Paterno, best remembered for his quantitative investigations into human physiology and his development of medical instruments, criticized occult celestial explanations in a sustained manner in his 1603 *Methodi vitandorum errorum omnium*. After dismissing the idea that occult qualities derive from substantial forms, Santorio rejected the identification of innate heat with celestial heat, basing himself on

⁴² Alessandro Massaria, *Practica medica*, Frankfurt, 1601, p. 676: 'Quare cum nos habeamus causas periodorum febrium, & manifestas, & certas, supervacaneum est ad lunam, & astram confugere'; 'non solum supervacaneum, sed etiam stultum est, ad occultas confugere'.

⁴³ Eustachio Rudio, *De humani corporis affectibus dignoscendis, praedicendis curandis, & conservandis liber tertius*, Venice, 1592, fol. 98r.

⁴⁴ Eustachio Rudio, *De morbis occultis et venenatis libri quinque*, Venice, 1610, pp. 17–18; Eustachio Rudio, *Liber de anima*, Padua, 1611, pp. 137–8; Fabrizio Bigotti, *Physiology of the Soul: Mind, Body, and Matter in the Galenic Tradition of the Late Renaissance (1550–1630)*, Turnhout: Brepols, 2019, pp. 169–85.

⁴⁵ Prospero Alpino, *De praesagienda vita et morte aegrotantium libri septem*, Venice, 1601, fol. 101v.

⁴⁶ Giovanni Tommaso Minadoi, *Disputationes duae. De causa periodicationum in febribus. De febre ex sanguinis putredine*, Padua, 1599, fols. 11r–16v; Girolamo Fracastoro, *Homocentrica eiusdem de causis criticorum dierum per ea quae in nobis sunt*, Venice, 1538, fols. 72v–73v.

⁴⁷ Orazio Augenio, *Quod homini certum non sit nascendi tempus, libri duo*, Padua, 1595, pp. 188–95; Augenio, *Epistolarum et consultationum medicinalium prioris tomi libri XII*, Venice, 1592, fols. 90v–94r.

an interpretation of Aristotle's theory of ether. Santorio argued that Aristotle held, against Plato, that the heavenly substance is completely distinct from the four sublunary elements. Neither does elemental fire share its circular motion nor can celestial heat be counted among the grades of heat found on earth.⁴⁸

Santorio's interpretation of Aristotle, whom he found authoritative, corresponded to readings of Aristotle put forward by earlier philosophers at Padua that agreed with Pico's. Giacomo Zabarella, for example, argued that celestial bodies can only heat through their motion and light, because their matter is distinct from the elements, and that elemental and vital heat are not distinct from each other.⁴⁹ Francesco Piccolomini agreed that Aristotle thought that celestial bodies used only light and motion as their instruments.⁵⁰ Cesare Cremonini's views are even more relevant to Santorio's. Although most of his teachings at Padua were on Aristotelian texts, Cremonini was recognized as an expert in medicine, having been inducted into Venice's College of Physicians in 1598.⁵¹ The two frequented Paolo Sarpi's circle, which was allied to young Venetian patricians who opposed the papacy's meddling in Venice's affairs. Some members of this circle were among the *riformatori* of the University of Padua in the years immediately after the interdict of 1606–7.⁵² Sarpi rejected the philosophical foundations of astrology and complained that its use was in fashion in Rome at the ecclesiastical courts.⁵³ Both Santorio and Cremonini used Aristotle's distinction between the terrestrial and celestial to dismiss astrology, including its use to predict critical days.⁵⁴ They also both dismissed Fernelian ideas about occult causation, holding that the virtues and faculties of the bodily mixtures derived from the elements rather than 'the whole substance'.

Santorio reduced causation to terrestrial matter in his earliest writings. In the *Methodi vitandorum errorum omnium*, he criticized Pietro d'Abano for tracing the periodicity of diseases to the moon. Rather, Santorio maintained that the causes lie within the internal and natural propensity of humours to putrefy in a set period.⁵⁵ The eighth book criticizes the Fernelian tenet that occult qualities derive from the total substance. In these years, Cremonini promoted a similar position, namely that the elements' forms come from the manifest primary qualities and not from an unknowable substantial form. Robert Pasnau contends that Cremonini's position 'lifted the veil', making the nature of the elements knowable through sensation and thereby potentially allowing for the intelligibility of elemental compounds.⁵⁶

Santorio's commentary on Avicenna's *Canon*, which was based on lectures given at Padua, addresses similar themes to those found in *Methodi vitandorum errorum omnium*. He connected his dismissal of occult and celestial causes to several subjects, including Fernel's theory of diseases of the total substance, the powers of the imagination and astrology. Santorio tackled Avicenna's notorious position that the imagination can affect

⁴⁸ Santorio Santorio, *Methodi vitandorum errorum omnium libri quindecim*, Venice, 1603, fols. 165r, 175v–176v.

⁴⁹ Giacomo Zabarella, *De rebus naturalibus*, Frankfurt am Main, 1617, cols. 556–82; Paolo Palmieri, 'Science and authority in Giacomo Zabarella', *History of Science* (2007) 45(4), pp. 404–27, 415–17.

⁵⁰ Francesco Piccolomini, *Librorum ad scientiam de natura pars secunda, in qua agitur de attinentibus ad coelum*, Venice, 1596, fol. 73v: 'puto dicendo caelestia corpora solum pro instrumentis uti Lumine & motu, non aliis distinctis influxibus'.

⁵¹ Richard Palmer, *The Studio of Venice and Its Graduates in the Sixteenth Century*, Padua: Lint, 1983, p. 20.

⁵² Sandro De Bernardin, 'I riformatori dello studio: Indirizzi di politica culturale nell'Università di Padova', in Girolamo Arnaldi and Manlio Pastore Stocchi (eds.), *Storia della cultura veneta: il Seicento*, vol. 4/1, Vicenza: Neri Pozza, 1983, pp. 61–91, 64–73; De Bernardin, 'La politica culturale della Repubblica di Venezia e l'Università di Padova nel XVII secolo', *Studi veneziani* (1974) 16, pp. 443–502, 458–64.

⁵³ Paolo Sarpi, *Lettere ai protestanti*, vol. 1 (ed. Manlio Duilio Busnelli), Bari: Laterza, 1931, pp. 86–7.

⁵⁴ Craig Martin, 'Astrological debates in Italian Renaissance commentaries on Aristotle's *Meteorology*', *Early Science and Medicine* (2019) 24(4), pp. 311–39, 332–6; Siraisi, op. cit. (8), pp. 284–9.

⁵⁵ Santorio, op. cit. (48), fol. 150v.

⁵⁶ Robert Pasnau, *Metaphysical Themes 1274–1671*, Oxford: Oxford University Press, 2011, pp. 132–4.

bodies at a distance. He understood Avicenna's argument to depend on an analogy with the celestial realm; that is, the imagination can influence external bodies in the same way that the celestial bodies 'command' lower bodies. According to Santorio, this analogy fails, because the heavens cannot act on all sublunary bodies, but only on those they are 'coordinated' with, and the imagination has no continuity or coordination with external bodies. Consequently, witches cannot harm with the evil eye that emits rays. Ruling out demonic causes, Santorio left open the possibility that some instances of supposed witchcraft can be explained by real physical causes, such as vapours emitted from the body, but that many, including zodiac signs engraved on rings, are impostures, frauds or fables.⁵⁷

A *quaestio* that addressed Avicenna's understanding of air's effects on health provided Santorio the opportunity for digressions on astrology.⁵⁸ In a lengthy dismissal of astrology, he contended that the heavens act on the sublunary world only through light and motion; that is, without using occult influences. The light and motion of heavenly bodies are responsible for many changes in the sublunary world, including alterations in bodily temperament, the life cycles of fish, and fluxes in the air's humidity.⁵⁹ Santorio, however, distinguished this understanding of the effects of the heaven from astrology, which he considered to be exclusively concerned with prediction. His arguments against astrology range widely. They include appeals to ancient authority (Hippocrates, Plato and Galen praised only astronomy and not astrology), empirical experiments using his thermometer to try to measure heat derived from moonlight only to find that it was insufficient to produce bodily changes, personal experience, and practical concerns (the predictions of astrologers, especially of one, most likely the Ferrarese physician Ippolito Obizzi, who criticized Santorio's *De statica medicina*, often fail). He polemicized that astrologers' theories are absurd and ridiculous; their prognostications are impostures.⁶⁰

Santorio dismissed religious authorities used to support the legitimacy of astrology, writing that the holy fathers 'praised astronomy and not astrological fictions'.⁶¹ He conceded that Thomas Aquinas, in the commentary on the second book of Aristotle's *De generatione et corruptione*, a work that is no longer attributed to Thomas, put forward that 'whoever should know the powers of the signs and star when someone is born, can also prognosticate about the whole life'.⁶² Santorio medicalized his reading of the passage, understanding it to refer to the production of grades of temperament in infants by light. But he read the statement as conditional, a hypothesis contrary to fact, because of the impossibility of diagnosing the grades of the temperaments of bodily organs, much less the heavens' temperament. He concluded that the church 'fathers did not expressly teach astrology' and suggested that in cases where the fathers are 'completely distant from the truth', like Lactantius' denial of the Earth's sphericity, we are not obliged to follow them.⁶³

⁵⁷ Santorio Santorio, *Commentari in primam fen primi libri Canonis Avicennae*, Venice, 1625, cols. 593–6; Siraisi, op. cit. (8), pp. 285–7.

⁵⁸ Siraisi, op. cit. (8), pp. 284–9.

⁵⁹ Santorio, op. cit. (57), col. 73.

⁶⁰ Santorio, op. cit. (57), cols. 76–83.

⁶¹ Santorio, op. cit. (57), col. 75: 'Quae vero dicta sunt a sanctis Patribus: respondemus illos laudasse Astronomiam, & non figmenta Astrologica'. On Robert Bellarmine's use of Thomas Aquinas and Augustine to define the acceptable limits of astrology see Neil Tarrant, 'Reconstructing Thomist astrology: Robert Bellarmine and the papal bull *Coeli et terrae*', *Annals of Science* (2020) 77(1), pp. 26–49.

⁶² Santorio, op. cit. (57), col. 75: 'Nos quoque cum ipsis concedimus, & cum D. Tho. 2. De generatione, quod qui sciret virtutes signorum, & stellarum, dum aliquis nascitur, posset quoque prognosticari de tota vita'; Thomas Sutton, *Expositionis D. Thomae Aquinatis in libros Aristotelis in libros Aristotelis De generatione et corruptione continuatio* (ed. Francis E. Kelley), Munich: Verlag der Bayerischen Akademie der Wissenschaften, 1976, pp. 188–90.

⁶³ Santorio, op. cit. (57), col. 75: 'Praeterea respondemus, Patres non ex professo didicisse Astrologiam: ideo aliquando a veritate omnino aliena protulerunt: sicuti id quod dicunt de Lactantio, qui nunquam voluit, credere, terram esse sphaericam'. Siraisi, op. cit. (8), p. 288.

Santorio's arguments correspond to interpretations of Aristotle given in lectures at Padua. During these same years, Cremonini attacked astrology in lectures on Aristotle's *Meteorology*. Cremonini's multi-pronged polemic depended on the contention that Aristotle's insistence on the incommensurability between the four terrestrial elements and heavenly ether limited the effects that the stars and planets have on earth and on human life. This polemic addressed medicine, as he tried to undermine the doctrine of critical days.⁶⁴ Two of Santorio's arguments closely correspond to Cremonini's. The first is that astrologers posit that certain stars or aspects are malign or have other characteristics, like melancholy, that the heavens could not possess.⁶⁵ The second depends on interpreting Aristotle. Santorio's position is based his reading of a passage from *De caelo* 2.7 that reads 'from them [the heavenly bodies] heat and light are generated, caused by the friction in the air made by their movement'.⁶⁶ He interpreted Aristotle as holding that 'the heavens act on inferior things only by light and motion; and that the heavens do not impress any quality on the air except for those that derive from light and motion'.⁶⁷ Consequently, Santorio concluded that Avicenna's discussion of air does not regard celestial 'influences' but only considers exhalations and meteorological phenomena.

Both Cremonini and Santorio rejected heliocentrism. Santorio, in his commentary on the *Canon*, concluded that the Earth does not move.⁶⁸ Their views stem from an adherence to traditional natural philosophy and the authority of Aristotle, but their arguments against celestial heat in living bodies, against astrology and against celestial influences also conform to their insistence on the incommensurability between celestial and sublunary matter, rendering their views difficult to reconcile with new developments in the Tychonic and Copernican world systems.

The politics of astral medicine

Until the 1620s, the endorsement of limitations on the powers of celestial bodies ran across the political and religious spectrum at Padua. Mercuriale was close to the ecclesiastical authorities, and the Bishop of Padua rewarded him with use of a country villa after he demanded that German students attend mass.⁶⁹ Cremonini, in turn, protected Protestant students. Despite their support for the anti-Roman factions in Venice, Santorio's and Cremonini's attacks on astrology do not appear to be motivated by religious considerations, notwithstanding Santorio's willingness to weigh in on the church fathers. Astrology in some forms was permitted and practised across the confessional divide. While astrology applied to medicine, agriculture and navigation was licit according to Catholic doctrine, it was not a truth of the faith or an obligatory practice.⁷⁰ One of Cremonini's rivals at Padua, Giorgio Ragusei – a professor of philosophy, an ordained priest and an expert in theology – held that the sublunary elements are incommensurable with celestial bodies and polemicized against astrology.⁷¹ Unlike Cremonini and Santorio, Ragusei did not accept Pico's views about astral causation. Rather, he held that the stars

⁶⁴ Martin, op. cit. (54), pp. 332–6.

⁶⁵ Santorio, op. cit. (57), col. 77.

⁶⁶ Aristotle, *DC*, 2.7.289a20–21.

⁶⁷ Santorio, op. cit. (57), col. 83.

⁶⁸ Santorio, op. cit. (57), cols. 118–24; Siraisi, op. cit. (8), pp. 270–5.

⁶⁹ Giuseppe Ongaro and Elda Martellozzo Forin, 'Girolamo Mercuriale e lo Studio di Padova', in Arcangeli and Nutton, op. cit. (30), pp. 29–50, 47–9.

⁷⁰ Tarrant, op. cit. (61).

⁷¹ Giorgio Ragusei, *Peripateticae disputationes*, Venice, 1613, pp. 1–19; Ragusei, *Epistolarum mathematicarum seu De divinatione libri duo*, Paris, 1623, pp. 25–50.

affect through light, motion and influence. Yet he rejected what he called ‘divinatory astrology’ (*divinatrix astrologia*) and, in agreement with professors of medicine at Padua, argued that astrology is neither necessary nor useful to the field of medicine, which must apply cures related to the proximate causes, not to the universal and remote ones.⁷²

Rudio, Santorio and Cremonini forged allegiances with Venice’s political faction that sought to counter Rome’s power. This faction’s influence waned in the 1620s, as Venice became divided between the pro-Roman oligarchic faction linked to Giovanni I Corner and the anti-Roman ‘poor’ nobility who favoured Renier Zen. In 1624, Santorio’s contract was not renewed. Corner, who served as a *riformatore* for the university before being elected doge in 1625, called Pompeo Caimo from Rome to take up the chair in anatomy.⁷³ Caimo’s medical and philosophical teachings were heavily mediated by Platonic considerations. In addition to his medical work, he practised astrology. German students were displeased with his appointment and mocked his lack of expertise in anatomy.⁷⁴ Unlike most post-Vesalian anatomists, he employed a surgeon to cut open the body while he lectured ‘in the old style’.⁷⁵

Cremonini opposed Caimo in a treatise that specifically addressed the distinction between heavenly and superlunary bodies. In *Apologia de calido innato*, printed in 1626, Cremonini continued to put forward the position that he had promoted in his lectures on the *Meteorology*. Namely Cremonini, like Pico, argued that the heavens act on sublunary bodies only through light and heat. In *De calido innato*, he argued that, although the primary qualities in mixtures and living beings are animated by the heavens’ heat, they are incommensurable with respect to substance. The innate or vital heat found in semen differs from other terrestrial mixtures’ heat only in degree.⁷⁶ Cremonini targeted Caimo, who also published a treatise on innate heat in 1626. Caimo maintained that heat is found in substances of two different kinds in living beings, one connected to temperament and another eternal hot spirit of the soul.⁷⁷ He supported his position by linking Plato’s *Timaeus* to a passage in Aristotle’s *De longitudine et brevitate vitae* that reads that ‘all living things are by nature wet and hot’.⁷⁸ Using an argument similar to one Fernel employed, he contended that since lizards and snakes lack heat in their temperament – that is, they are cold to the touch – therefore they must possess a different kind of heat that gives them life. This kind of heat is celestial, he concluded.⁷⁹ Numerous passages from Galen and Hippocrates provide additional support.

While the polemics between Cremonini and Caimo were heated, the distance in their approaches was not great. Cremonini championed one ancient authority, Aristotle; Caimo another, Galen. Both counted medical students among their followers. The disagreements emerged not just from hermeneutics but also from institutional conflicts that reflected political tensions in Venice and also disputes about disciplinary boundaries and

⁷² Ragusei *Peripateticae*, op. cit. (71), pp. 225–35.

⁷³ Giuseppe Ongaro, ‘La controversia tra Pompeo Caimo e Cesare Cremonini sul calore innato’, in Ezio Riondato and Antonino Poppi (eds.), *Cesare Cremonini: Aspetti del pensiero e scritti*, Padua: Accademia Galileiana, 2000, pp. 87–110.

⁷⁴ *Acta nationis germanicae artistarum (1616–1636)* (ed. Lucia Rossetti), Padua: Antenore, 1967, pp. 242–3.

⁷⁵ Tomasini, op. cit. (3), p. 448: ‘Pompeius Caimus Utinensis ex veteri consuetudine lectiones Anatomicas orditur, Hieronymo Sablono incisore’.

⁷⁶ Cesare Cremonini, *Apologia dictorum Aristotelis de calido innato*, Venice, 1626, pp. 57–65; Linda Deer Richardson, *Academic Theories of Generation in the Renaissance: The Contemporaries and Successors of Jean Fernel (1497–1558)* (ed. Benjamin Goldberg), Cham: Springer, 2018, pp. 127–42.

⁷⁷ Ongaro, op. cit. (73); Bigotti, op. cit. (44), pp. 91–6.

⁷⁸ Aristotle, *PN* 466a18–20.

⁷⁹ Pompeo Caimo, *De calido innato*, Venice, 1626, pp. 30–1; Jean Fernel, *De naturali parte medicinae libri septem*, Paris, 1542, fol. 68v.

hierarchies. Professors of medicine at Padua increasingly presented their investigations into the human body and its health as part of natural philosophy, and Cremonini resisted their encroachments into his field.⁸⁰ Nevertheless, the insistence on the philosophical character of medicine corresponded with the inclusion of Aristotelian philosophy in the medical curriculum.

The growing scepticism among professors of Padua toward applying astrology and celestial influences to medicine seemingly undermined part of the motivations for instruction in astronomy during the first decades after 1600. This scepticism may have contributed to the marginalization of astrology in the short term.⁸¹ During the time that Santorio and Cremonini lambasted astrology and doubted the ability of the heavens to influence through occult causes, the chair of mathematics remained vacant at Padua for two years after Giovanni Camillo Gloriosi's departure in 1622. His replacement, Barthélemy Souvey (Sovero) pleased his Venetian overseers with his erudition in Greek and Latin letters and expertise in geometry and mechanics.⁸²

This sceptical consensus toward astrology, however, did not last. By 1628, Venice's political factionalism provoked a constitutional crisis as the city erupted in violence, marked by assassination attempts, sedition and rioting. The University of Padua reflected political divisions. As opposing factions alternated in power, they were unable to maintain full control over the professoriate during the 1610s and 1620s. Sarpi's circle, dominant without having complete control for much of the 1610s, largely gave way to the oligarchic factions in the 1620s, which brought in professors from Rome, such as Caimo and later Andrea Argoli in 1632, both of whom promoted astrology.⁸³ The oligarchic faction supported Santorio's and Cremonini's rivals, who countered their polemics against astrology and astral causes. In the 1630s, in works deeply informed by Greek literary sources, Argoli defended the astrological interpretation of critical days and put forth rules for determining the length of illnesses that depended on linking the humours and bodily faculties to the positions of celestial bodies on the zodiac, demonstrating them in printed horoscopes of famous rulers and ecclesiastical leaders.⁸⁴

Conclusion

The Faculty of Arts at Padua attracted students by its teaching of anatomy, simples and especially clinical medicine.⁸⁵ Anatomy and botany had little use for astrological explanations. Teaching clinical medicine distinguished Padua, as no universities in Northern Europe taught the subject until Leiden began to in 1636.⁸⁶ Anatomical demonstrations attracted some students for its assistance in understanding the physiological processes behind the diagnosis and treatment of internal diseases.⁸⁷ German students were

⁸⁰ Cynthia Klestinec, *Theaters of Anatomy: Students, Teachers, and Traditions of Dissection in Renaissance Venice*, Baltimore: Johns Hopkins University Press, 2011, pp. 58–89.

⁸¹ Martin, op. cit. (54).

⁸² Gloriosi, op. cit. (3), pp. 74–9; Niccolò Comneno Papadopoli, *Historia gymnasii patavini*, vol. 1, Venice, 1726, p. 353; Adriano Carugo, 'L'insegnamento della matematica all'università di Padova prima e dopo Galileo', in Girolamo Arnaldi and Manlio Pastore Stocchi (eds.), *Storia della cultura veneta: il Seicento*, vol. 4/2, Vicenza: Neri Pozza, 1984, pp. 151–99, 197–9.

⁸³ De Bernardin, 'I riformatori', op. cit. (52).

⁸⁴ Andrea Argoli, *De diebus criticis et de aegrorum decubitu libri duo*, Padua, 1639; Argoli, *Epheremides annorum 50. Iuxta Tychonis hypotheses, et accurate e coelo deductas observationes. Ab 1630 ad annum 1680*, Padua, 1638, pp. 67–72.

⁸⁵ Michael Stolberg, 'Bedside teaching and the acquisition of practical skills in mid-sixteenth-century Padua', *Journal of the History of Medicine and Allied Sciences* (2014) 69(4), pp. 633–61.

⁸⁶ Grendler, op. cit. (1), pp. 341–2.

⁸⁷ Michael Stolberg, 'Teaching anatomy in post-Vesalian Padua: an analysis of student notes', *Journal of Medieval and Early Modern Studies* (2018) 48(1), pp. 61–78, 70–3.

particularly drawn to the writings and teachings of Da Monte, who opposed Fernel's etiology and the astral interpretation of Galen.⁸⁸ Da Monte's case studies, which reflect his instruction in clinical medicine, largely if not completely ignore any role for astrology in practical medicine, as do Mercuriale's and Trincavelli's.⁸⁹

In the 1610s and 1620s, personal and institutional disagreements arose, although in many ways the two sides shared similar approaches. Both sides agreed that instruction in philosophy and medicine should be based on interpretations of traditional authorities, including Hippocrates, Galen and Aristotle. In this way, Padua differed little from some of their rival universities that emphasized medicine. For example, Leiden's philosophy curriculum remained based on verbatim (*verbatim*) readings of Aristotle during these same years.⁹⁰ Paduans' textual interpretations at times diverged from each other as they privileged different authorities and their readings were mediated by experiences and experiments. The hermeneutical techniques and textual foundation remained into the 1620s. The attraction of classical authorities stemmed more from providing the foundations for medicine and contributing to physicians' ability to distinguish themselves socially from other kinds of healers than from the ruling parties' ideologies. Ancient sources can be used to support a variety of positions.

Medical practitioners in Padua cast doubt about the usefulness of astrology and astral causation as early as the 1540s. Professors of philosophy followed, promoting restrictive readings of Aristotle. Early modern astrology in the Catholic world employed Aristotelian ideas developed in the Middle Ages, and the Catholic Church used Thomas Aquinas to legitimize some forms of astrology.⁹¹ Yet famously there were multiple versions of Renaissance Aristotelianism.⁹² There never was a single Aristotelian–Ptolemaic–Galenic system. Rather, Santorio's example shows that even interpretations of Thomas's views about astrology varied. Cremonini rejected Thomism in favour of separating Aristotelian philosophy from theology, while Ragusei and Caimo leaned toward Thomistic and Platonic interpretations.⁹³

The lack of agreement among the professoriate is no surprise. One of the most pervasive criticisms of early modern universities was their contentiousness. Unlike early modern Jesuits, who devised curricula and methods for disciplining their teaching ranks to achieve specific philosophical, pedagogical and religious goals, the University of Padua lacked mechanisms for systematically policing its professoriate.⁹⁴ Rather, the university reflected the heterogeneity of Venetian political leaders, which in turn manifested itself

⁸⁸ Andrew Wear, 'Galen in the Renaissance', in V. Nutton (ed.), *Galen: Problems and Prospects*, London: The Wellcome Institute, pp. 248–50; Wear, 'Explorations in Renaissance writings on the practice of medicine', in Wear, French and Lonie, op. cit. (5), pp. 140–3; Stolberg, op. cit. (87).

⁸⁹ Da Monte, op. cit. (10); Girolamo Mercuriale, *Liber responsorum et consultationum medicinalium*, Basel, 1588; Vittore Trincavelli, *Consiliorum medicinalium libri III*, Venice, 1586.

⁹⁰ Edward G. Ruestow, *Physics at Seventeenth and Eighteenth-Century Leiden: Philosophy and the New Science in the University*, The Hague: Martinus Nijhoff, 1973, pp. 12–38.

⁹¹ H Darrel Rutkin, 'How to accurately account for astrology's marginalization in the history of science and culture: the central importance of an interpretive framework', *Early Science and Medicine* (2018) 23(3), pp. 217–43.

⁹² Charles B. Schmitt, *Aristotle and the Renaissance*, Cambridge, MA: Harvard University Press, 1983, pp. 10–33.

⁹³ Craig Martin, *Subverting Aristotle: Religion, History, and Philosophy in Early Modern Science*, Baltimore: Johns Hopkins University Press, 2014, pp. 117–20.

⁹⁴ Ugo Baldini, *Legem impone subactis: Studi su filosofia e scienza dei Gesuiti in Italia, 1540–1632*, Rome: Bulzoni, 1992, pp. 75–119; Christoph Sander, 'Uniformitas et soliditas doctrinae: history, topics, and impact of Jesuit censorship in philosophy (1550–99)', in Cristiano Casalini (ed.), *Jesuit Philosophy on the Eve of Modernity*, Leiden: Brill, 2019, pp. 34–71.

in professorial claims to liberty. The *libertas patavina* was chained to pedagogical needs and intellectual traditions that emphasized textual exegesis and tied natural philosophy to medical instruction.

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