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RESEARCH ARTICLE

Is astrology universal? Early modern globalization and the disruption of traditional knowledge

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Abstract

The maritime expansion of the early modern period and the discovery of new continents necessitated a profound revision in traditional cosmology, bringing into question the millennia-old practices that were framed around that cosmology. Among these practices was astrology, which in the early modern period reached an unprecedented level of popularity through the development of the printing press. The application of the astrological corpus in tropical and southern latitudes questioned many of the foundational Ptolemaic concepts. At the core of this problem was the reversal of the seasons in the southern hemisphere. Since Ptolemy had firmly grounded the natural explanation of astrological attributes of the zodiac and the planets on the seasonal qualities, their reversal would imply a complete change in the zodiacal and planetary properties. Authors such as Girolamo Cardano, Tommaso Campanella and Athanasius Kircher addressed this matter, but it never became a central point of debate in the astrological literature of the period. However, practitioners in the New World, whose empirical view was very different to that of European authors, reached different conclusions. This problem offers an example of the difficulty in reconciling traditional authority with new knowledge. At the same time, it exposes the sharp contrast between the theoretical perspective of Europe-based authors and the actual experience of astrologers practising in the New World.

Consider for a moment that you are a cosmographer born in the sixteenth century, well trained in mathematics, astronomy, geometry and geography by the best scholars. You live at a time when, in a matter of decades, the world would become much larger than had been previously conceived. One of your essential duties is to prognosticate the weather and the conditions of the year using astrology, studying the changing configurations of the planets, eclipses and the occasional comet. As an expert in your field, you are sent by your king to a distant new land beneath stars never seen by your predecessors. However, the climate in this new land behaves differently from what you have learned, and its qualities are new and unexpected. Its weather turns your northern spring into a southern autumn, and the stars where comets wander are unknown to the centuries-old canons you apply to your studies. What do you do? How can you perform your duties where nature has been turned upside down?

This was probably the sort of challenge faced in 1589 by Enrico Martínez (*c*.1550–1632), cosmographer to the king of Spain, when he arrived in New Spain.[1] He discussed his experience of this matter in 1606 when he published the first almanac of the New World in Mexico, the *Reportorio de los tiempos, y historia natural desta nueva espana*.[2] This text follows the expected structure of the Reportorio genre, but perhaps for the first time in this context, it includes important considerations regarding the New World and its implications for astrology. It presents an extended discussion of the problems concerning the practice of astrology in the New World and, most importantly, in the southern hemisphere, offering practical guidelines on how to resolve them.

By the time Martínez wrote his treatise, more than a hundred years had passed since Europeans had reached the southern hemisphere, regions that myth and assumption had held to be uninhabitable. The first crossings of the equator by the Portuguese off the coast of Africa were made in the 1470s, and the first descriptions of stars in southern latitudes appeared in manuscript form in 1500 and in print by 1506. Therefore, by 1606, this was no novelty.[3] Yet the impact of the new hemisphere on the astrological canons was hardly mentioned until the seventeenth century. Since the southern hemisphere experience was unprecedented in European astrology, it was not a minor matter. The foundational principles that Ptolemy had laid down in the second century and were supported by Aristotelian natural philosophy were at stake. Martínez, working in Mexico since 1598, was not the first to consider how astrology should be applied to the New World, but he offers the first empirical debate on the challenges astrologers faced when practising in the newly colonized lands. An in-depth comparison between his views on the subject and those of other well-known scientific actors of this period provides a map of this lesser-known discussion and its reception, providing an interesting example of the clash between the traditional cosmological models and the New World concepts brought forward by early modern globalization.

In the last decades, many academic studies have been produced on the impact of early modern globalization on European science, addressing a variety of subjects from astronomy to zoology and botany.[4] Despite this wide-ranging historiographical debate on the obvious impact of the New World on traditional European knowledge, astrology, with its complex technical language, has been overlooked, despite the fact that the subject

[1] Francisco de la Maza, *Enrico Martínez: Cosmógrafo e Impresor de Nueva España*, Mexico: Ediciones de la Sociedad Mexicana de Geografía y Estadística, 1943.

[2] The first would have been the *Lunario y Regimiento de Salud* (1604) also by Martínez, which does not survive but is referred to in the *Reportorio de los tempos*. Bruce Stanley Burdick, *Mathematical Works Printed in the Americas, 1554–1700*, Baltimore: Johns Hopkins University Press, 2009, pp. 186.

[3] For early descriptions see the letter to King Manuel I of Portugal by physician and astrologer Mestre João Faras, who sailed with Pedro Álvares Cabral to India and Brazil in 1500 (Lisbon, Arquivo Nacional da Torre do Tombo, Corpo Cronológico, Parte III, mç. 2, no. 2); Andrea Corsali, *Lettera di Andrea Corsali allo illustrissimo Signore Duco Iuliano de Medici: venuta Dellindia del mese di Octobre Nel M.D.XVI*, Florence: Per lo. Stephano di Carlo da Pauia, 1516: Elly Dekker, 'The light and the dark: a reassessment of the discovery of the Coalsack Nebula, the Magellanic clouds and the southern cross', *Annals of Science* (1990) 47(6), pp. 529–60.

[4] Stuart B. Schwartz, *Implicit Understandings: Observing, Reporting and Reflecting on the Encounters between Europeans and Other Peoples in the Early Modern Era*, Cambridge: Cambridge University Press, 1994; Serge Gruzinski, *Les quatre parties du monde*, Paris, Editions de La Martinière, 2004; David N. Livingstone and Charles W.J. Withers (eds.), *Geography and Revolution*, Chicago: University of Chicago Press, 2005; Antonio Barrera-Osorio, *Experiencing Nature: The Spanish American Empire and the Early Scientific Revolution*, Austin: University of Texas Press, 2006; Jorge Cañizares-Esguerra, *Nature, Empire, and Nation: Explorations of the History of Science in the Iberian World*, Stanford, CA: Stanford University Press, 2006; Harold Cook, *Matters of Exchange: Commerce, Medicine, and Science in the Dutch Golden Age*, New Haven, CT: Yale University Press, 2007; María M. Portuondo, *Secret Science: Spanish Cosmography and the New World*, Chicago: University of Chicago Press, 2013; Pamela Smith and Paula Findlen (eds.), *Merchants and Marvels: Commerce, Science, and Art in Early Modern Europe*, New York: Routledge, 2013; Karl A.E. Enenkel and Paul J. Smith (eds.), *Zoology in Early Modern Culture: Intersections of Science, Theology, Philology, and Political and Religious Education*, Leiden and Boston: Brill, 2014; Stephen Greenblatt, *Marvelous Possessions: The Wonder of the New World*, Chicago:

was not invulnerable to these changes and to new knowledge. As a pervasive element of early modern society, it reflected its demands and culture. There are notable differences between medieval and early modern astrological practices, for example. From the mid-fifteenth century onwards, there was an increasing appeal to create more mathematical forms of astrological interpretation. Kepler's *Harmonice Mundi* (1619), in which he introduces new geometrical relationships between the planets, is perhaps one of the best-known examples.[5] Another new element is the increasing focus on the individual, as put forward in the writings of Marsilio Ficino (1433–99) and expanded by seventeenth-century authors.[6] Yet, like the other forms of knowledge, it was grounded in the established Ptolemaic–Aristotelian system. As Darrel Rutkin put it, astrology's rationale was built around 'well-established structures of astrologising Aristotelian natural knowledge'.[7] Thus any challenges to this system would affect astrology's doctrines and methodologies. Authors such as Anthony Grafton have highlighted the central role of astrology in early modern society and used it as a case study of traditional knowledge challenged by the adaptation and transformation of the classical tradition.[8] Yet astrology is debated mainly regarding its use in learned contexts, scientific credibility and efficacy. Its internal concepts and rules are omitted from these studies or only mentioned in a very general manner. However, the discovery of the New World and the colonization of territories in southern latitudes presented, above all else, an important technical challenge with the potential to shatter astrology's foundations. To understand its magnitude and implications, a study of astrology's internal reasoning is necessary.

The role of astrology in the colonization of the New World has been addressed in important contributions by Jorge Canizares Esguerra and Claudia Brosseder. Their focus was on how natural philosophy engaged with the astrological description of the new territories and the social and political impact of such narratives on how Europeans viewed the inhabitants of the New World, both native and Creole.[9] Their study details the social implications

University of Chicago Press, 2017; Ralph Bauer and Jaime Marroquín Arredondo (eds.), *Translating Nature: Cross-cultural Histories of Early Modern Science*, Philadelphia: University of Pennsylvania Press, 2019; Marcy Norton, *The Tame and the Wild: People and Animals after 1492*, Cambridge, MA: Harvard University Press, 2024.

[5] David Juste, 'Musical theory and astrological foundations in Kepler: the making of the new aspects', in Laurence Wuidar (ed.), *Music and Esotericism*, Leiden: Brill, 2010, pp. 177–95.

[6] Steven Vanden Broecke, 'Catholic spirituality and astrological self-care in seventeenth-century France: Jean-Baptiste Morin's Astrologia Gallica (1661)', *Lias* (2020) 42(2), pp. 119–41; 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 International Publishing, 2019.

[7] 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, 239.

[8] William R. Newman and Anthony Grafton (eds.), *Secrets of Nature: Astrology and Alchemy in Early Modern Europe*, Cambridge, MA: MIT Press, 2001; Anthony Grafton, April Shelford and Nancy G. Siraisi (eds.), *New Worlds, Ancient Texts: The Power of Tradition and the Shock of Discovery*, Cambridge, MA: Belknap Press of Harvard University Press, 1992.

[9] Jorge Canizares Esguerra, 'New world, new stars: patriotic astrology and the invention of Indian and Creole bodies in Colonial Spanish America, 1600–1650′, *American Historical Review* (1999) 104(1), pp. 33–68; Claudia Brosseder, 'Bernabé Cobo's recreation of an authentic America in colonial Peru', in William J. Bulman and Robert G. Ingram (eds.), *God in the Enlightenment*, Oxford: Oxford University Press, 2016, pp. 83–106; Brosseder, 'Reading the Peruvian skies', in Brendan Maurice Dooley (ed.), *A Companion to Astrology in the Renaissance*, Leiden: Brill, 2014, pp. 399–427; Brosseder, 'Astrology in seventeenth-century Peru', *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences* (2010) 41(2), pp. 146–57. See also Margarita Suárez Espinosa, *Astros, humores y cometas: Las obras de Juan Jerónimo Navarro, Joan de Figueroa y Francisco Ruis Lozano (Lima, 1645–1665)*, Lima: Pontificia Universidad Católica del Perú, 2019, pp. 35–41; and Espinosa, 'Astrología y Poder en la Corte de Lima, Siglo XVII', in Carmen Bernard, Eduardo França Paiva and Carmen Salazar-Soler (eds.), *Serge Gruzinski: Le passeur persévérant*, Paris: Editions du CNRS, 2017, pp. 113–22.

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of this form of colonial science but engages very little with the technical aspects of astrological practice or its principles. The adaptation of astrology to the New World was also discussed by Tayra Lanuza Navarro, who explored the case of Enrico Martínez, previously referred to by Canizares Esguerra.[10] This study focused on Martínez's original proposal for the astrological qualities of New Spain and its reception, but it did not address the matter of astrological practice in the subtropical regions, which Martínez also debates. Previously I engaged with this topic in more detail from the internalist perspective of astrological doctrine, showing the existence of two positions regarding astrology in the southern hemisphere: one stemming from the theoretical Ptolemaic rationale underlying astrological doctrine and another resulting from empirical observation by practitioners.[11] Following this line of study, this paper will expand and develop this discussion, demonstrating how the colonization of the southern hemisphere affected astrology.

Ptolemy in the southern latitudes

Astronomically speaking, the most conspicuous contrast between the two hemispheres is an entirely new set of southern stars and constellations. These stars were outside the millennia-old canons of astrology, and their qualities remained uncatalogued. However, the stars were not the biggest problem given the limited use of stars in mainstream astrological practice. The more important stars in practice were those nearer to the ecliptic which were already known. The new southern hemisphere stars, invisible in the northern hemisphere, were located at much higher celestial latitudes and, like their circumpolar northern counterparts, would be less significant.

The real challenge to astrology was the notable difference in the seasons, from the indeterminate weather of the tropical regions to their complete reversal in temperate southern latitudes. Since Ptolemy's *Tetrabiblos*, the natural explanation of astrological concepts was tied to the seasonal cycle. Although these concepts preceded Ptolemy by several centuries, in his work he directly links the seasons to foundational principles such as the choice of a tropical zodiac, the modal qualities of the signs, and the associations of planets to signs known as rulerships or essential dignities (Figure 1).[12]

According to Ptolemy, the signs that begin the seasons are called moveable since they denote the movement from one season to another; those that correspond to the middle of the season are known as fixed since seasonal attributes are consolidated therein; the end of the season is marked by the double or common signs, representing the change of one season to the next. The planetary rulerships, or domiciles, of the planets, are defined by setting the luminaries, the sun and moon, as rulers of the signs that have the greatest number of daytime hours: Leo and Cancer respectively. In the opposite signs, which represent the time of year when night has the longest length, Saturn, the furthest planet from the luminaries, becomes the ruling planet. The remaining planets are assigned their rulerships in the signs, following their sequence in the celestial spheres: Jupiter, Mars, Venus and Mercury. Except for the two luminaries, all planets have two signs of rulership: one masculine and diurnal, one feminine and nocturnal. The dignity of exaltation follows a similar rationale, associating the sun with Aries, where the length of the day begins to increase, and Saturn with Libra, where the days decrease; the remaining planets are associated with signs belonging to a season concurrent with their essential qualities of heat, cold, moisture and dryness.

[10] Tayra Lanuza Navarro, 'Adapting traditional ideas for a new reality: cosmographers and physicians updating astrology to encompass the New World', *Early Science and Medicine* (2016) 21(2–3), pp. 156–81.

[11] Luís Campos Ribeiro, *Jesuit Astrology: Prognostication and Science in Early Modern Culture*, Leiden and Boston: Brill, 2023, pp. 208–16, 232.

[12] *Tetrabiblos* I.17–19. Ptolemy, *Tetrabiblos* (tr. F. E. Robbins), Cambridge, MA and London: Harvard University Press, 1940, pp. 79–91.

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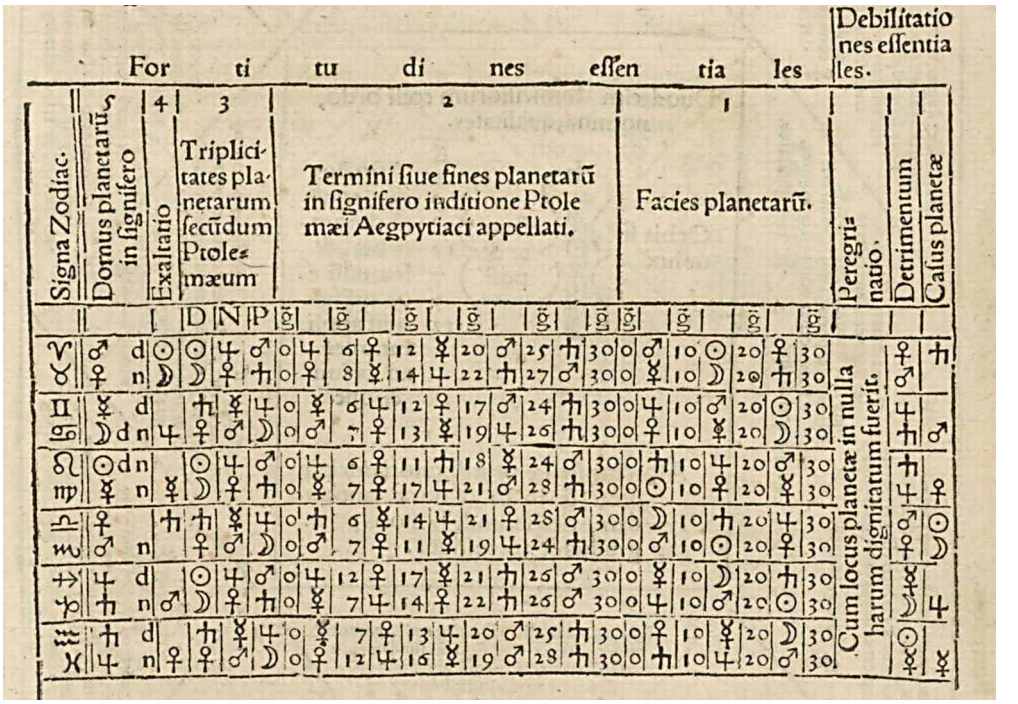

Figure 1. Traditional table of rulerships, exaltations and other essential dignities of the planets, used to measure the planet's strength in a chart and to establish astrological meaning and nuance in the astrological judgement. Johann Schöner, *Opusculum Astrologicum ex diversorum libris summa cura pro studiosorum utilitate collectum*, Nuremberg: Iohan. Petreium, 1539.

Since they aligned with the accepted Aristotelian view of the cosmos, Ptolemy's reasons became the principal explanation for astrological doctrine until the seventeenth century. Therefore, following this accepted explanation, the indistinct seasons in the tropics or their complete inversion in the southern hemisphere would compromise the doctrine of the qualities of the signs and planetary rulerships.

Is astrology universal?

There appear to be no significant references to the southern hemisphere in astrological literature until the middle of the sixteenth century, more than fifty years after its initial discovery and exploration. According to Mary Ellen Bowden, authors used the southern hemisphere to criticize astrology.[13] However, her example focuses only on Christopher Heydon (1561–1623), whose work briefly addressed the change in the seasons, discussing none of its repercussions for astrological doctrine. Such argumentation could have become a critical strike against astrology's efficacy if its critics had engaged with the practical consequences of such an inversion. Yet if astrology's antagonists ever employed such an argument it was not in print. Neither Giovanni Pico della Mirandola (1463–94) nor later critics, such as Benito Pereira (1536–1610), Martin Delrio (1551–1608) or Alessandro de

[13] Mary Ellen Bowden, 'The Scientific Revolution in astrology: the English reformers, 1558–1686', PhD thesis, Yale University, 1974, 80, 135.

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Angelis (1559–1620), mention the problem of the efficacy of astrology in the southern hemisphere.[14]

On astrology's side, Girolamo Cardano (1501–76), whose works on mathematics, medicine and astrology are well known in the historiography, appears to be the first astrologer to mention this matter and its practical consequences, at least in print and in an astrological text.[15] In this commentary on *Tetrabiblos*, published in 1554, when discussing the attribution of the planetary houses or rulerships, Cardano states,

> From this, it follows that in the Austral half, Capricorn is the domicile of the moon, and Aquarius that of the sun, Pisces and Sagittarius of Mercury, Aries and Scorpio of Venus, Taurus and Libra of Mars, Gemini and Virgo of Jupiter, Cancer and Leo of Saturn.[16]

In this very short note and following the precepts of Ptolemaic doctrine, Cardano reverses the rulerships of the signs to accommodate the seasons of the southern hemisphere. Yet, despite the profound practical implications of this reversal, most astrological texts, even the main books of instruction, make no reference to it. It could be speculated that the practice of astrology in the southern hemisphere was negligible by 1554, but the colonization process had been well under way since the beginning of the century. Even if the omission is mainly due to a lack of practical necessity, the magnitude of this problem for astrology is so great that its near-complete omission seems odd and difficult to explain.

Almost eight decades later, Tommaso Campanella (1568–1639) appears to be the first to pick up and further develop this concept of the reversal of dignities. He devotes a segment of his *Astrologicorum* libri VII (1630) to discussing and developing the concept of the inversion of essential dignities, extending this idea to the equatorial regions.[17]

Following the same rationale given to the sign rulerships by Cardano, Campanella reverses all the other essential dignities. First, the exaltations, where the sun becomes exalted in Libra (instead of Aries), the moon in Scorpio (the opposite of Taurus), Saturn in Aries (the opposite of Libra), Jupiter in Capricorn, Mars in Cancer, Venus in Virgo and Mercury in Pisces. The triplicities follow where the reversal extends to the signs, which are radically changed in their elemental qualities. The fire element is attributed to Libra, Aquarius and Gemini (instead of Aries, Leo and Sagittarius), becoming the triplicity of the sun and Jupiter. Scorpio, Pisces and Cancer represent the abode of the earth element (traditionally Taurus, Virgo and Capricorn), with the moon and Venus assigned as their earth triplicity. The air signs encompass Sagittarius, Aries and Leo (in place of Gemini, Libra and Aquarius), while Saturn and Mercury serve as their triplicity rulers. Capricorn, Taurus and Virgo transform into signs of the water element (traditionally Cancer, Scorpio and Pisces), coming under the triplicity rulership of Mars, with the involvement of Venus and the moon.

[14] Giovanni Pico della Mirandola, *Disputationes adversus astrologiam divinatricem*, Bologna: B. Hector, 1496; Benito Pereira, *Adversus fallaces & superstitiosas artes, id est de magia, de observatione somniorum & de divinatione astrologica libri tres*, Lyon: ex officina Juntarum, 1590; Martín Antoine Del Rio, *Disquisitionum magicarum libri sex*, Lyon: Gerardus Rivius, 1599; Alessandro de Angelis, *In astrologos coniectores libri quinque*, Lyon: Horatio Cardon, 1615.

[15] Anthony Grafton, *Cardano's Cosmos: The Worlds and Works of a Renaissance Astrologer*, Cambridge, MA and London: Harvard University Press, 2001.

[16] Gerolamo Cardano, *In Cl. Ptolemaei Pelusiensis IIII de Astrorum iudiciis, aut, ut vulgo vocant, Quadripartitae Constructionis, libros commentaria, quae non solum Astronomis & Astrologis, sed etiam omnibus philosophieae studiosis plurimum adiumenti adferre poterunt*, Basel: Henric Petrina, 1554, p. 78: 'Ex hoc tandem sequitur quod in Australi medietate Capricornus erit domus Lunae, & Aquarius Solis, Piscis & Sagittarius Mercurij, Aries & Scorpio Veneris, Taurus & Libra Martis, Gemini & Virgo lovis, Cancer & Leo Saturni.'

[17] Tommaso Campanella, *Astrologicorum Libri VII*, Frankfurt: Godefridus Tampachius, 1630, pp. 35–42.

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Despite Campanella's strict adherence to Ptolemy's seasonal rationale, the change in the elemental qualities of the signs would imply a profound and somewhat shocking shift in the astrological system and its practice. All the usual judgements based on the elemental qualities of heat, coldness, moisture and dryness would be radically different for the southern latitudes. This included the assessment of complexion, which was part of medical diagnosis; the judgement of personal inclinations; and most methods of weather forecasting. The last system in which Campanella proposes the inversion is that of the terms, despite considering them to be of little importance.[18] Here he gives the terms of one sign to the opposite one. Following the same rationale, another of his developments is a completely different set of rulership associations for the tropical region, where he suggests that both Aries and Libra become domiciles of the sun, and Cancer and Capricorn those of Saturn.[19] Despite this detailed discussion of the changes to the associations of the signs, Campanella offers no practical examples and develops no suggestions on how to incorporate them into practice. On the contrary, he leaves it as a theoretical proposal needing experimentation.

Another author who debates this matter in similar detail is the Jesuit polymath Athanasius Kircher (1602–80) in *Ars magna lucis et umbrae* (1646).[20] After a presentation of the traditional elemental qualities of the signs, Kircher discusses his views on astrology in the southern hemisphere. He believes that these principles cannot be applied worldwide because, although they 'were constituted very wisely by the ancients, it is not possible to draw from this a universal science'.[21] The ancient authors, who had no knowledge of the southern hemisphere, thought that the effect of the twelvefold division of the signs was the same everywhere, in which they 'were very much hallucinating'.[22]

> If the twelve signs are imbued with such and such qualities from themselves and from their nature, they will produce the same effect everywhere. But today, experience teaches us that our Antipodeans and Antoecians, like those amphiscians who dwell in the torrid zone, experience all things differently. A sign which experience teaches us is hot and dry, they perceive it as imbued with contrary qualities, that is cold and moist; and so, a hot and dry sign which brings us intense heatwaves will bring to them intense cold weather, and consequently there is no way the domicile of the sun can make any sense to them.[23]

He gives, as an example of his rationale, the case of Leo, a hot and dry sign, domicile of the sun, which in the north brings forth heat, but in the south produces cold. Like Cardano and Campanella before him, Kircher also believes that the domiciles or planetary rulerships, as

[18] The terms are unequal divisions of the signs into five parts each ruled by one of the five planets. By the seventeenth century some authors considered them unimportant or discarded them altogether. Ribeiro, op. cit. (11), pp. 394–6.

[19] Campanella, op. cit. (17), p. 36.

[20] Athanasius Kircher, *Ars magna lucis et vmbrae in decem libros digesta*, Rome: Hernanni Scheus & Ludouici Grignani, 1646, pp. 521–5.

[21] Kircher, op. cit. (20), p. 523: 'haec quidem sapienter ab antiquis esse constituta, non tamen inde universalem scientiam ullam condi posse'.

[22] Kircher, op. cit. (20), p. 523: 'sed dodecamoria signorum ubique eumdem effectum praestare arbitratos fuisse: in quo maximè hallucinati sunt'.

[23] Kircher, op. cit. (20), p. 523: 'Si enim dodecamoria signorum talibus & talibus qualitatibus ex se & sua natura imbuta sunt, ubique eundem effectum praestabunt; sed experientia hodie docet Antipodes, & Antaecos [reading Antoecos] nostros, uti & illos, qui sub zona torrida amphiscij habitant, omnia alia experiri. Signum enim, quod nobis calidum, & siccum experientia docuit, illi prorsus contrarijs qualitatibus imbutum reperiunt, videlicet figidum, & humidum; ita signum calidum, & siccum vehementes nobis aestus adducens, illis vehemens frigus causabit, & consequenter domus Solis nulla ratione conuenienter illis constitui potest.'

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well as other essential dignities, should be reversed: 'Hence, the houses in which for us the stars are exalted, in joy, in triumph, for our Antoecians and Antipodeans, they are in exile and detriment because these dignities follow nature with great precision.'[24] He reinforces his arguments by referring to the experiences of Europeans living and born in the southern hemisphere. Any criticisms of this proposal are, in his mind, due to the lack of knowledge of the southern region. Once more, he uses the example of the sun in Leo, which brings the cold weather to the southern latitudes. According to Kircher, in the north, when in Aries, the sun caused the generation of spring, and in Libra, it brought the destruction of autumn. Contrarily, in the southern latitudes, Libra caused generation, while Aries caused destruction. Like Campanella, he expands this rationale to the tropical equatorial region because, taking the concept of reversal as valid, adaptations must be made for its particular conditions:

> As I receive from word of mouth from the procurators of our Society under the torrid zone, like in Peru, Brazil and the Islands of the Philippines, these said qualities of the signs became confused, moist with dry, and cold with hot, to the point that one could hardly discern them. And so, under the equinoctial vertical, the signs Aries and Libra are experienced with a very moist and hot complexion, while the tropical signs tend more towards dryness and cold, and the remaining intermediate signs are each assorted to one or the other; hence that from such great alteration, the exotic effects that are caused are clearly distinct from those of the temperate zone.[25]

Here it becomes clear that Kircher, like Campanella, agrees with the modification of the elemental qualities of the signs according to each region and, consequently, the change in the planetary rulerships. Otherwise, he writes, an astrologer who judges a nativity for these regions using the traditional precepts will be mistaken:

> If someone based a nativity figure in the torrid zone or the southern hemisphere using the astrological canons, it is certain that nothing will signify what the astrologers affirm because in there, the nature of the signs or the houses is not the same, nor the dignities assigned to the planets, and it is impossible to establish legitimate coordination. And so it follows that the signs will have to be coordinated with the planetary forces they will obtain in those very same signs.[26]

Kircher further develops Campanella's initial proposal for the tropics and expands it into the polar regions, where astronomical conditions and changes in daylight are more extreme. Besides the nature of the signs and their planetary rulers, he also draws attention to other significant challenges astrology faces at higher latitudes: the computation of the

[24] Kircher, op. cit. (20), p. 523: 'Unde domus, in quibus nobis sydera exaltantur, gaudent, triumphant; Antaecis, Antipodibusque nostris exitia sunt, & detrimenta, cum hae dignitates naturam ad amussim sequantut'.

[25] Kircher, op. cit. (20), pp. 523–4: 'Sub zona verò torrida, quemadmodum à Peruuiae, Brasiliae, & Insularum Philippinarum Societatis nostrae Procuratoribus oretenus accepi; ita dictae signorum qualitates confusae sunt ut quod humidum siccum, frigidum calidum sit, vix dispicere possis. Ita sub aequinoctiali verticalia signa [Arietis] & [Librae] maximè humidae, & calidae complexionis experiuntur; tropica verò signa magis ad siccitatem, & figiditatem inclinari; reliqua intermedia signa aliud & aliud temperamentum sortiuntur: unde ex tanta varietate exotici quoque effectus causantur ab effectibus zonae temperatae prorsus distincti.'

[26] Kircher, op. cit. (20), p. 524: 'Si quis igitur sub zona torrida, aut australi hemisphaerio iuxta canones astrologicos systema conderet genethliacum, certum est illud nihil prorsus eorum, quae Astrologi promittunt, significaturum; Cum in eo neque natura signorum eadem, nec domuum, reliquarumque dignitatum planetis affectarum legitima coordinatio fieri possit: atque adeo signa cum planetarum viribus, quas in ijsdem signis obtinent, sic ordinanda forent.'

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astrological houses and the unusual movement of the planets according to the horizon. It was well known to any competent mathematician and astronomer that the computation of the commonly used astrological house division of the early modern period – the Rational System of Regiomontanus – began to distort and fail above the latitude of 66°.[27] This would make it impossible to calculate an astrological chart for that latitude and the planets could spend months above or below the horizon. This would completely distort their natural cycle of rising, culminating and setting observed in temperate and tropical regions, and therefore affect any astrological judgement: (Figure 2)

> Hence, he should be laughed at who made assertions about the fortune of someone born under the polar region or the frigid zone, or rain, or changes in the weather in the same region while not considering the required division of the houses nor the properties that the twelve signs obtain under the climates 5, 6, 7 and 8. Furthermore, when planets appear over the horizon of the cold region for an interrupted lapse of 3, 4, 5 or 6 months, or when they hide for the same period of time, certainly to attribute to this appearance or absence the same effect that we attribute to them in the temperate zone is something of a reckless, not to say stupid, person. Who does not know that this long appearance or occultation of the light of the celestial bodies would cause many different effects in those regions than in ours?[28]

Following Aristotelian and Ptolemaic views of astrology and adapting it to an expanding geography, Kircher argues that astrology is not universal. It must be accommodated to the region of the globe where it is practised. He offers a table where, besides the traditional elemental qualities of the signs and their planetary domiciles and exaltations for the northern temperate zone, he also presents their variations for the southern temperate zone and the tropical and polar regions. Only by combining this diverse reception of solar and lunar light with information about the natural disposition of a place, its geography and the quality of the native's parents can a proper astrological prognostication be made, since astrology does not rely solely on celestial causes. This affirmation and his entire presentation of the problem are embedded solely in Ptolemaic reasoning and the natural explanation and logic underlying the entire astrological system, even if it means changing the traditional system. However, in all of Kircher's reasoning and that of Campanella before him, there is no actual break with tradition; on the contrary, the Ptolemaic tradition is retained regardless, even when it warps established canons of astrology. There is no rupture but an addendum to tradition.

Notwithstanding the rationale behind this theory of inversion and adaptation of the humoral association and planetary rulerships of the signs, it ultimately remains a theory. Cardano makes little more than a suggestion and probably never engaged in the computation and judgement of a figure for the southern hemisphere or tropical region. Campanella and Kircher might have, but they provide no examples whatsoever of the application of

[27] Most common systems of house division, such as the standard (i.e. Alcabitius), the equatorial (i.e. Regiomontanus) and the vertical (i.e. Campanus) distort in latitudes above the polar circle since the ecliptic is too close to the horizon and some of its parts do not rise or set.

[28] Kircher, op. cit. (20), p. 525: 'Hinc ridendus foret, qui sub polari regione, seu zona frigida sibi quicquam sponderet circa fortunam Nati, aut pluuias, mutationesque temporum; cum eadem plaga, nec domorum recipiat diuisionem requisitam, neque dodecamoria signorum eandem, quam sub climate 5.6.7.8. obtineant, proprietatem. Cùm praetera Planetae 3.4.5. aut 6. mensium spacio perpetuo supra horizontem zonae frigidae appareant, aut sub illo eodem temporis interuallo condantur; certè hac manifestatione, aut absconsione, eosdem ijs effectus, quos nos sub zona temperata constituti ipsis ascribimus, attribuere, temerarij ne dicam stolidi hominis foret. Quis enim nescit hac perpetua luminis siderei apparentia, vel occultatione, multos alios effectus causari dictis in partibus, quàm nostris in regionibus?'

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Constitutio Signorum sub zona temperata Boreali.			*Dom⁹ planetarũ.*	*Exaltatio plan.*
1	♈	Calidum,& siccũ.	♂	☉
2	♉	Frigidum,& siccũ.	♀	☽
3	♊	Calidũ,& humidũ.	☿	
4	♋	Frigidum,& siccũ.	☽	♃
5	♌	Calidum,& siccũ.	☉	
6	♍	Frigidum,& siccũ.	☿	
7	♎	Calidũ,& humidũ.	♀	☿
8	♏	Frigidũ,& humidũ.	♂	♄
9	♐	Calidum,& siccũ.	♃	
10	♑	Frigidũ,& siccum.	♄	♂
11	♒	Calidũ,& humidũ.	♄	
12	♓	Frigidũ,& humidũ.	♃	♀

Constitutio Signorum sub zona temperata Australi.			*Dom⁹ planetarũ.*	*Exaltatio plan.*
7	♈	Calidũ,& humidũ.	♀	♄
8	♉	Frigidũ,& humidũ.	♂	
9	♊	Calidum,& siccũ.	♃	
10	♋	Frigidũ,& humidũ.	♄	♂
11	♌	Calidũ,& humidũ.	♄	
12	♍	Frigidũ,& humidũ.	♃	♀
1	♎	Calidũ,& humidũ.	♂	☉
2	♏	Frigidum,& siccũ.	♀	☽
3	♐	Calidũ,& humidũ.	☿	
4	♑	Frigidũ,& humidũ.	☽	♃
5	♒	Calidũ,& humidũ.	☉	
6	♓	Frigidum,& siccũ.	☿	☿

Constitutio Signorum sub zona torrida.	*Constitutio Signorum sub polo, seu zona frigida.*
♈ Humidum, & calidum.	♈ Calidum, & humidum.
♉ Frigidum, & humidum.	♉ Frigidum, & humidum.
♊ Calidum, & siccum.	♊ Calidum, & humidum.
♋ Calidum, & humidum.	♋ Calidum, & siccum.
♌ Frigidum, & siccum.	♌ Calidum, & siccum.
♍ Frigidum, & humidum.	♍ Calidum, & humidum.
♎ Calidum, & siccum.	♎ Frigidum, & siccum.
♏ Calidum, & humidum.	♏ Frigidum, & siccum.
♐ Frigidum, & siccum.	♐ Frigidum, & siccum.
♑ Frigidum, & humidum.	♑ Frigidum, & humidum.
♒ Calidum, & siccum.	♓ Frigidum, & humidum.
♓ Calidum, & humidum.	♒ Frigidum, & humidum.

Figure 2. Nature of the signs according to Athanasius Kircher in *Ars magna lucis et vmbrae in decem libros digesta*, Rome: Hernanni Scheus & Ludouici Grignani, 1646, p. 524, offering the differences for north and south temperate, tropical and polar regions.

their ideas to actual charts. Conversely, the astrological doctrine they present after discussing these potentially cataclysmic changes is merely the standard traditional corpus. It is safe to assume they are presenting it only as a theory rather than something derived from practical experience.

The practitioner's view

In parallel to this theoretical perspective, by the beginning of the seventeenth century the voices of those practising astrology in the New World began to be heard in this debate. Enrico Martínez appears to be the first to address, at least in print, the practical problems of the New World and the southern hemisphere. His argument is clearly derived from a

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local practical knowledge of astrology. Like Cardano, Campanella and Kircher, he identifies the difference in seasons and weather in each hemisphere as key. Instead of using merely theoretical astrology or natural philosophy as formerly, Martínez presents an argument from applied astrological weather forecasting, that of the fixed stars positioned in each sign. This is rooted in the practice of astro-meteorology, whose canons consider that the stars that co-rise, culminate and set with the sun have direct implications for the daily changes in the weather. This formed the basis for seasonally predictable weather, the most famous example of which was the hot days of the *canicula*, the dog days, associated with the heliacal rising of Sirius. Thus Martínez argues that although the movement of the sun in Aquarius in the southern regions appears to produce the same weather as when moving in Leo in the northern, the fixed stars in both signs are different and thus will signify different effects. Therefore, despite both signs representing the peak of summer in different hemispheres (Aquarius in the southern, Leo in the northern), they will still produce a different effect due to the distinct stars in those signs.[29] To this, he adds that the distance of the sun from the centre of the world differs in both signs, thus contributing to different effects.[30] This argument can be applied to other uses of astrology, such as nativities (see the Appendix).

In the European context, the French astrologer Jean-Baptiste Morin de Villefranche (1583–1656) also defended this idea of the universality of the astrological system.[31] Known for his fierce defence of astrology and geocentrism, Morin addresses the matter of the southern hemisphere in two places. The first is in a lesser-known publication titled *Ad australes et boreales astrologos pro astrologia restituenda epistolae* (1628), while the other is in his posthumous magnum opus, the *Astrologia gallica principiis & rationibus propriis stabilita atque in XXVI libros distributa* (1661). The first is particularly relevant as it precedes Campanella's book, establishes continuity with the ideas proposed by Cardano and Martínez, and reveals the expected but unseen debate on the topic. In this thirty-two-page pamphlet, Morin publishes two letters he sent to two astrologers, asking them for assistance in clarifying how astrology was practised in the extreme conditions of the southern latitudes and the subpolar regions. The first letter is addressed to a certain F.L.M., a 'great expert in celestial physics' ('physicae caelestis peritissimum') in Lima, Peru.[32] In this letter, Morin asks for his assistance and experimentation to clarify two questions: (1) whether the elemental qualities of the signs should be inverted for the southern hemisphere, and (2) whether the domiciles and exaltations of the planets should likewise be reversed. He explains that this has been a continuing debate among many astrologers and those who rage against astrology: how can the same signs and planetary strengths produce the opposite qualities in each hemisphere; that is, summer and winter? He reiterates that the ancient Greeks, Arabs and Latin authors had no knowledge of the southern regions of the globe. Thus a science that should, by its nature, be universal was only applied to the northern regions.

Morin considers the elemental qualities of the signs, the planetary domiciles and exaltations to be truths with significant weight within astrology, which form the basis of all astrological judgement. He regards Ptolemaic doctrine as essentially true but asks for experimental verification. Do the planets have universal causes, act with one light, one

[29] Note that the author is considering the effects of precession, so the stars in the sign of Leo are not necessarily all of those of the constellation of Leo.

[30] The sun is much closer to Earth when transiting Aquarius than when in Leo, since the perihelium of the Earth occurs when the sun is in Capricorn.

[31] Robert Alan Hatch, 'Between astrology and Copernicanism: Morin – Gassendi – Boulliau', *Early Science and Medicine* (2017) 22(5–6), pp. 487–516; Steven Vanden Broecke, 'An astrologer in the world-systems debate: Jean-Baptiste Morin on astrology and Copernicanism (1631–1634)', in Natacha Fabbri and Federica Favino (eds.), *Copernicus Banned: The Entangled Matter of the Anti-Copernican Decree of 1616*, Florence: Leo S. Olschki, 2018, pp. 223–41.

[32] Jean-Baptiste Morin, *Ad australes et boreales astrologos pro astrologia restituenda epistolae*, Paris: Ioanner Moreau, 1628, pp. 3–13: 'physicae caelestis peritissimum'.

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motion and a single influence, or do they have two? Should there be two, he argues, the inverse of each other, then at the torrid zone close to the equator, the influences should be non-existent since they would cancel each other out. This would render any judgements of the revolutions of the year, eclipses and lunations impossible, something that Morin considers absurd. Equally, no determination could be made regarding the life, temperament or manners of those born there since these judgements depend on the qualities of the ascending sign and its planetary ruler. However, this should be adequately clarified by observing lunations and eclipses in the southern hemisphere. Should there be an inversion of the planetary rulers of the signs, the effects of the eclipses would be entirely different since they are described by the planetary ruler of the sign of the syzygy and the ruler of the following angle.

In the same fashion, this could easily be tested in the nativities of individuals with extraordinary fortune or misfortune. Should the known rules of astrology apply to these cases, then the same canons can be used in both hemispheres. Whatever the case might be, Morin calls for caution. In his view, the observation of the weather can be used as a touchstone because it belongs to the first part of astrology – the revolutions of the years of the world – and it is more universal because things such as nativities depend on it.[33] So Morin asks his southern correspondent to provide data on nativities and notable weather events with a precise time and place, so that accurate conclusions can be drawn.

Morin is quite unsure about changing the nature of the signs and their planetary rulers. He seems to consider the inversion concept to be unreliable or even incongruous, and he is unwilling to challenge tradition without some experimental data. Yet his phrasing reveals that he is eager to obtain these data to reach definite conclusions. Morin also confirms that the reversal of sign qualities and rulerships has been the subject of debate among astrologers, and, as Bowden claims, this argument was used by astrology's critics. Unfortunately, he identifies no authors.

Morin's commitment is further emphasized by the second letter in this pamphlet. In it, he engages another facet of his quest to clarify astrology's functioning: that of the subpolar regions. Addressed to Danish astronomer Christen Sørensen Longomontanus (1562–1647), the letter asks for clarification on how he and his fellow astrologers deal with several aspects of astrology in such high northern latitudes. Morin wants to know whether astrologers practising in the Arctic Circle follow Ptolemy and the Arabs, how they compute the houses when the ecliptic coincides with the horizon, how they judge eclipses and lunations when planets may remain above the horizon for several days or months, and how the extreme weather conditions at these latitudes are considered in astrological terms.

Unfortunately, we do not have the replies to these letters or know whether they ever existed. However, some conclusions can be drawn from Morin's magnum opus, the *Astrologia gallica*, where he addressed many of these matters more than twenty years later.[34] At this time, his views on the matter of the southern hemisphere were consolidated, and he discussed them when addressing the topic of the essential dignities of the planets in the first chapter of Book Fifteen, 'An signa Zodiaci sint ejusdem naturae atque virtutis toto Orbe Terrarum'.[35]

[33] 'Revolutions of years of the world' designates the branch of astrology which studies ingresses, eclipses and lunations, and their effects on crops, weather and political affairs. In the strict sense it refers to the charts for the beginning of each season.

[34] Jean-Baptiste Morin, *Astrologia gallica principiis & rationibus propriis stabilita, atque in XXVI. libros distribute*, The Hague: Ex typographia Adriani Vlacq, 1661.

[35] Jean-Baptiste Morin, *Astrologia Gallica Books 13, 14, 15, 19* (tr. James Herschel Holden), Tempe, AZ: American Federation of Astrologers, 2007, pp. 7–25 (Book 15); Originally Morin, op. cit. (34), Book 15, Chapter 1, pp. 330–5.

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Morin begins by reproaching Cardano's absurd opinion, and even more so Campanella, who amplified Cardano's error.[36] He does not mention Kircher's text; he may have been unaware of it, or it may not have been published by that time (it appeared sometime in the 1640s).

Returning to some of the arguments he had presented years earlier in his letter, Morin states that by experience the effects of eclipses, lunations and nativities are observed in the equatorial region, the right sphere (*sphaera recta*). If Cardano's idea of a different system for each hemisphere is one in which one is the inverse of the other, then this would not be observed since no planetary influence or effect would be felt in the equatorial regions because they would cancel each other out. As for Campanella, whom Morin thinks 'fell into Scylla while trying to avoid Charybdis', he considers his deductions absurd and self-contradictory regarding his proposition of planetary rulerships for the tropics. Morin, an avid astrology practitioner, demonstrates his position with three birth charts. The first is the nativity of the alleged prince of Ethiopia, Zaga Christ (*c.*1610–38), born at a latitude of about six degrees north and thus well within the tropical zone. Knowing his biography and nativity, Morin concludes that traditional Ptolemaic and Arabic astrology can clearly be applied to this case. He follows with two examples of nativities from the southern hemisphere. Here, Morin thanks a certain N. Groenembergue, a Portuguese naval officer who was himself an astrologer, for providing him with the birth data and biographical details of two individuals born in the southern hemisphere, more specifically in Brazil: Francisco Gomes Cortez and Felipe Bandeira de Melo.[37] Morin's computations present some deviations, and the description of the charts depicted is oddly inconsistent. Nonetheless, he concludes that by using the traditional canons of astrology, an accurate description of the temperament and life of these men can be reached. The same would not be true had the planetary rulers been inverted, as Cardano and the others proposed. Rooting his argumentation in practice rather than pure Ptolemaic theory, Morin offers, seemingly, the only experimental approach ever discussed in print. This makes these charts, which seem to be the first southern nativities featured in a pedagogically oriented European astrology book, key to counterarguing the theoretical position.

Armed with this evidence, Morin consolidates his opinion that astrology is to be universally applied to both hemispheres and all regions of the globe, and the elemental natures of the signs and the planetary rules do not change. He argues that the qualities of the planets are the same in both hemispheres and that they can only be slightly altered by their own motion (i.e. eccentricity) but not by their passage from north to south of the equator. He also argues that the triplicities, one of the foundational concepts of astrological doctrine, would collapse since signs of the element fire, such as Sagittarius, would come under the element water, contradicting the northern experience. This would lead to the same type of astrological configuration being interpreted contrarily by astrologers in different hemispheres, something Morin considers unreasonable. Morin was aware that the experiences of global travel and exploration affected the deep-seated ideas held by the traditional practices of European astrologers. At the same time, Morin was deeply concerned with the coherence of his art, and unwilling to contradict any of the foundational authors and principles of astrology, especially Ptolemy.

[36] Morin, op. cit. (35), pp. 8–9 (Book 15).

[37] Morin, op. cit. (34), pp. 332–4. Felipe Bandeira de Melo is likely to be the known Portuguese captain from Olinda, Brazil, who fought in the Portuguese Restauration wars and in the second Dutch invasions of Brazil. José Antônio Gonsalves de Mello, *Filipe Bandeira de Melo*, Recife: Universidade do Recife, 1954. Francisco Gomes Cortez appears to have been a Portuguese military man stationed in Brazil. The fact that Groenembergue had these horoscopes in his collection is further evidence that astrology was being practised by the Portuguese and the Spanish in the southern latitudes.

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Voices from the South

Examples of this practice, which Morin was so eager to find, are rare since, if they survive, they will mainly be in the personal notes of astrologers, not in printed works. A rare example of this is found in the notes made by the German mathematician Georg Marggrafe (1610–44), while working for John Maurice of Nassacu (1604–79) in the Dutch colony of Pernambuco, Brazil, between 1638 and 1644. Marggrafe is well known for his significant role in the first published natural history of Brazil, *Historia Naturalis Brasiliae* (1648), and his astronomical observations.[38] Among his mathematical manuscripts are several pages with astrological charts and their computations, three of which are for individuals born in Brazil.[39] The charts are all calculated for the latitude of 8° south, corresponding to Mauritsstad (or Mauritius) on the island of António Vaz (all part of present-day Recife) and nearby locations.[40] The horoscope where he offers more data is that of a certain 'Filiola Stelde[?]', identified as Elisabeth Silnaer (1636–9), daughter of Hans Silnaer. While the other charts for Brazil are simply computational listings, Marggrafe draws a complete figure for Elisabeth's nativity twice, including notes on planetary positions, rulerships and directions.[41] Among other things, he states that Saturn, at 10° of Capricorn, is in his nocturnal domicile; that Mars, at 25° of Libra, is in the domicile of Venus and is in detriment; and that Jupiter, at 1° of Virgo, is in its detriment. Evidently Marggrafe is using the standard essential dignities and is not applying the reversal of the planetary rulers for southern latitudes or any adaptation of that sort for the torrid zone (Figure 3).

Further corroboration of Morin's views appeared in print after his death, in the medical–astrological text by Juan de Figueroa (1583–1665), a physician based in Peru. Born in Granada, Spain, he established his life and practice in Lima, becoming a 'familiar' of the Inquisition, head (*regidor*) of the mint of Lima and Potosí, and serving as a member of Lima's town council and as mayor.[42] Published in 1660, just a year before Morin's posthumous work, the *Opusculo de astrología en medicina* is a major textbook in which Figueroa presents the canons of medical astrology.[43] Unsurprisingly, the *Opusculo* extensively discusses medical practice in Peru and the southern regions. Like his peers before him, he accounts for the specific differences in the people, climate and seasons, and how these can be beneficial or harmful to health. His treatment of astrology and its applications to medicine assists with understanding how he deals with the southern latitudes. While his predecessors, such as Martínez, debated the medical–astrological properties of the New World and its inhabitants at the beginning of the seventeenth century, Figueroa appears to be working with an already established system. His application of astrology to the South American context reinforces the idea of the universality of astrology. This is indicative of astrological

[38] On Marggrafe see Huibert Jan Zuidervaart and Oscar Toshiaki Matsuura, *Astronomer, Cartographer and Naturalist of the New World: The Life and Scholarly Achievements of Georg Marggrafe (1610–1643) in Colonial Dutch Brazil*, vol. 1: *Life, Work and Legacy*, Amsterdam: Amsterdam University Press, 2022.

[39] John David North, 'Georg Markgraf: an astronomer in the New World', in North, *The Universal Frame: Historical Essays in Astronomy, Natural Philosophy, and Scientific Method*, London and Ronceverte, WV: Hambledon Press, 1989, pp. 215–34. See also Zuidervaart and Matsuura, op. cit. (38), pp. 297–301.

[40] Zuidervaart and Matsuura, op. cit. (38), pp. 299–300. Marggrafe's notes with the horoscopes can be found in Erfgoed Leiden en Omstreken – ELO, Marggrafe papers, library sign. LB 7000–1. Elisabeth Silnaer's nativity is in notes 97 and 98.

[41] Directions are a forecasting method used to map relevant moments of an individual's life by moving the planets and other points in a chart by equating a degree of ascensional motion to one year of life.

[42] On Figueroa see Brosseder, 'Reading the Peruvian skies', op. cit. (9); for his biography, see Guillermo Lohmann Villena, *Los regidores perpetuos del Cabildo de Lima (1535–1821): crónica y estudio de un grupo de gestion*, Sevilla: Diputación Provincial de Sevilla, 1983; and Espinosa, *Astros, humores y cometas*, op. cit. (9).

[43] Juan de Figueroa, *Opusculo de astrologia en medicina, y de los terminos, y partes de la astronomia necessarias para el uso della*, Lima, 1660. A partial modern edition was published in Espinosa, *Astros, humores y cometas*, op. cit. (9).

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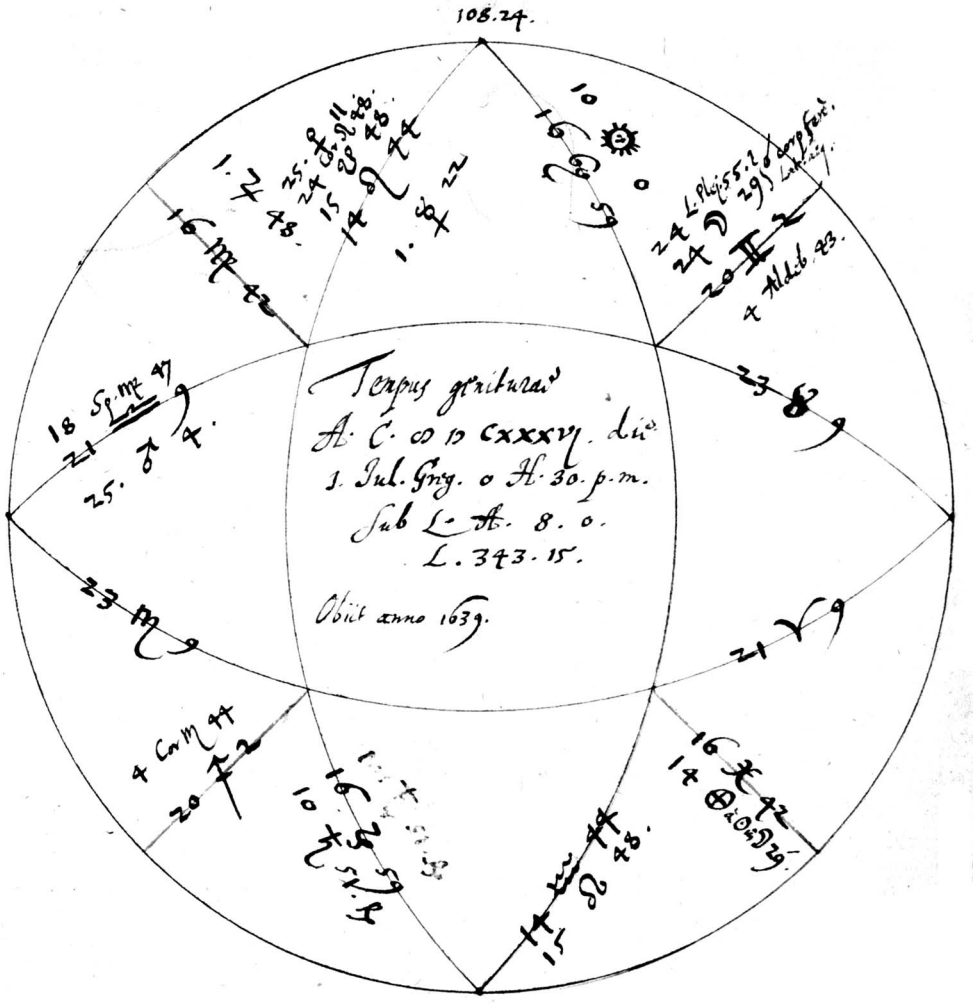

Figure 3. Astrological figure of Elisabeth Silnaer, calculated for Recife, Brazil, 'Sub L*atitudine Australi* 8°0′, L*ongitudine* 343°15′'.

practice at southern latitudes by the middle of the century. Taking Figueroa's work as an example, the inversion theory had no impact on the practice of astrology in the southern hemisphere, since he used the same rules of interpretation, with some minor, though essential, adjustments to latitude and the climate from the perspective of medical practice.

Figueroa is quite aware of the debate on reversing the sign qualities and rulerships. Grounding his position in his experience as a practitioner in the southern hemisphere, he engages in the discussion by respectfully disagreeing with Campanella:

> Father Campanella finds it difficult if the dignities of the planets in the Antarctic are one and the same as those in the Arctic. He seems to be inclined to demonstrate that they are the opposite. The reason he gives is to say that the sun exalting in Aries is the beginning of Spring in Europe and that when the sun has this beginning in

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> America, being in Libra, its exaltation should be switched, and consequently all other dignities, being in no doubt that by the effects we come to know the causes and other reasons; however, being such a learned man, he recognizes that he speaks only by reports and refers to experience. This [experience] says that the essential dignities of the planets do not change. However, they can be altered accidentally, and Aries being the exaltation of the sun, Leo its house, and its triplicity, the Fiery, is due to natural convenience. The appropriation that it has with these signs is not because it is at the beginning of Aries in the spring, nor are changes in its effects in other regions, flaws of the sun or the signs, but because of the disparity of the regions. This does not prevent that when the acting causes are the same, they will produce in all parts [of the World] the same things.[44]

By emphasizing the immense variety of weather conditions and seasons in the southern territories alone, he demonstrates that although the material circumstances of each region can modify the celestial influences, they do not change their essential qualities. Consequently, the nature of planetary influence and dignity in each sign remains constant, regardless of the hemisphere from which they are observed:

> it is without a doubt that the indisposition of the elemented thing can impede and divert the celestial influences, which, without losing or changing their qualities, operate according to the disposition and concurrence of the Elements, while the planets always keep their dignities in both hemispheres.[45]

Figueroa proposes a rather radical change to the traditional Ptolemaic explanation of the astrological system.[46] In place of an association of the planets with the signs, explained by a natural seasonally based affinity as posited by Ptolemy, he suggests a 'natural convenience and appropriation' of the planet with the sign. This would resolve any problems originating from the seasonal inversion of the southern hemisphere and other variations in the torrid and polar regions. The rationale is that terrestrial conditions should not impact superior causes such as the planets, the signs and their mutual affinities expressed by the system of essential dignities. By considering the system of planetary essential dignities as a part of the celestial causes and not a construct derived from the seasonal cycle, Figueroa offers a rationale for its universal application. Regarding the matter of the seasons, he states that they are universal in their essential qualities (i.e. winter is always cold and moist, and summer is always hot and dry). However, they vary in intensity from place to place due to the specific earthly conditions of each region. Thus the same occurs with astrological influences:

[44] Figueroa, op. cit. (43), fols. 13v–14r: 'Dificulta el Padre Campanela si las dignidades de los Planetas en este Antartico, son unas mesmas que en el Artico; y parece que se inclina a demonstrar, que son las contrarias: y la razon que dá, es dezir, que el Sol se exalta en Aries, principio del Verano en Europa, y que teniendo el Sol este principio en la America, estando en Libra, se deve trocar la exaltacion, y consiguientemente las demas dignidades: no siendo de dudas, que por los efectos venimos en conocimiento de las causas, y outras razones: si bien como tan docto, reconoce que solo habla por noticias, y remite a la experiencia. A que se dize, que las dignidades essenciales de los planetas no se mudam, aunque por algunos accidentes se alteram, y que el exaltarse el Sol en Aries, ser su casa Leon, y su triplicidad la Ignea, es por natural conveniencia, y annexion que tiene con estos signos, no por que sea, o no el principio del Verano in Aries, ni el variar en distintas Regiones sus efectos, son defectos del Sol, ni de los Signos, sino disparidad de las Regiones: que no obsta que las causas agentes sean unas, para producir en todas partes unas mesmas cosas.'

[45] Figueroa, op. cit. (43), fol. 14r: 'con que no es de dudas que la indisposición de lo elementado puede impedir, y extraviar las influencias celestes, las quales sin perder ni transmutar sus qualidades, obran segun la disposicion, y concurso de los Elementos, obteniendo siempre los Planetas sus dignidades en ambos Emisferios.'

[46] Ribeiro, op. cit. (11), p. 214.

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> Hence, it is plainly verified that the complexions, established by each of the four quarters of the year, are of the same qualities generally in all regions of the universe, more or less intense in some than in others and consequently, also the doctrines of the physicians and astrologers that wrote on the influences and the object …[47]

The temperamental qualities apply to both hemispheres but at opposite times of the yearly cycle. This is independent of the sun's position in the zodiac. Thus the universal nature of this phenomenon confirms the validity of the traditional astrological rules, which can, therefore, be applied by physicians and astrologers in the southern hemisphere.

By accepting these premises, Figueroa is drastically departing from the Ptolemaic explanation that bounded astrology to the northern hemisphere and generated the convoluted systems proposed by Campanella and Kircher. Being locked with the seasonal cycle, this account would imply a constant change of the foundational rules of astrological judgement for every region of the globe. The result would be quite impractical. Since he obtains successful results using traditional planetary rulers and sign qualities, like Morin and Marggrafe, he concludes that this particular part of Ptolemy's doctrine must be wrong. Thus the Ptolemaic explanation of these phenomena, based on the seasons, must be reanalysed. Yet, while he departs from tradition, he still respects the classical inner logic of astrology, mixing the innovation of a new explanation for the hemispherical differences with a traditional Aristotelian explanation. He puts forward a more canonical Aristotelian rationale than Ptolemy, clearly separating celestial (superior) causes, such as the planets and signs, from terrestrial (inferior) causes, such as local climate and conditions. The superior causes act on the inferior, but despite the inferiors reacting differently according to their nature, they cannot act upon the superior causes. Thus seasons and local climate cannot determine planetary rulerships or sign qualities as Ptolemy proposed. In the same manner as Martinez discussed the differences in seasons by using the commonly accepted astrological reasoning of the fixed stars, Figueroa uses astrology's traditional background to explain why the signs have the same qualities and rulers in both hemispheres.

Given its complexity as a full astrology manual, the *Opusculo* also offers a view of other astrological methods that needed to be handled differently in the southern hemisphere. The most obvious is the calculation of the astrological chart, which Figueroa explains in detail in Book One, Chapters 23–25, and the computation of directions addressed in Book Four, Chapter 20. All these required adaptations for the southern latitudes.

He also notes some important differences in some of the concepts and methodologies of astrology. A simple one regards the elevation of the planet by latitude. While, traditionally, a planet is considered elevated when it has a higher northern latitude, Figueroa notes, in Book One, Chapter 17, that in the southern hemisphere the opposite occurs, since a planet will be higher in the southern horizon when it has a greater measure of southern latitude.[48] Also important is Figueroa's discussion of the validity of the astrological–medical canons for the southern hemisphere in Book Two, Chapter 6. Here, he restates and develops some of his arguments regarding the universal nature of planets and signs, arguing that weather changes are linked with the region's material particularities, not a change in celestial causes. Here, he also makes a quite relevant argument regarding the new stars of the southern hemisphere. It seems that Figueroa is not certain of their quality, and although he

[47] Figueroa, op. cit. (43), fol. 114r: 'De que llanamente consta, que las complexiones, que en cada una de las quatro quartas tiene el año constituidas, son de unas mismas qualidades generalmente en todas las regiones del universo, mas, o menos intensas en unas, que en otras: y por consequencia lo son las dotrinas de los Medicos, y Astrologos, que escrivieron del influxo, y el objecto'.

[48] Figueroa, op. cit. (43), fol. 27r.

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lists the new constellations of the Arctic, he does not address their stars or their astrological natures. However, he makes an important consideration as to their use in astrological practice.[49] He reasons that, despite their qualities being unknown, they are already included in the way the signs of the zodiac are experienced since all stars are projected onto the ecliptic. Therefore, even unknowingly, their qualities have always been perceived as part of the signs where their projection falls; something already applied to the stars of the north:

> because the virtue and efficacy of the stars are found in the ecliptic, in the analogue degrees that correspond to them, for which their qualities have always been known by their effects, even when some have not been seen in other parts, due to the declinations, meridians or latitudes of the different regions. Similarly, in the provinces of the Arctic, some stars are also hidden in some places, and there is no doubt that their qualities are known since they are incorporated in the twelve signs in which all stars of the firmament are included, and their influences are experienced in each sign.[50]

Written more than half a century since Enrico Martínez first made his observations, Figueroa's work corroborates his initial commentary, developing those ideas further and offering a more concise explanation of how astrology is applied to the southern hemisphere and, consequently, to the entire globe. Figueroa also supports Morin's opinions without mentioning him. This creates an interesting possible connection with Morin's letter to Peru in 1627 since Figueroa was working there. However, there is no evidence that they ever corresponded.

An unfinished debate

Despite this, astrological literature remains unclear as to which of the two views of astrology triumphed. Figueroa's *Opusculo* was published when the acceptance of astrology in academic contexts was rapidly waning. Its marginalization as an area of scientific enquiry perhaps accounts for this lack of clarity, although southern hemisphere astrological practitioners and the physicians, like Figueroa, still considered it worthy. However, doubt still appears to linger. The *Opusculo* was published in South America and written in Spanish, not Latin, a fact that might have severely limited its impact on the global practice of astrology, and the same can be said regarding Martínez's work. An example of this uncertainty is the Jesuit scholar Valentin Stansel (1621–1705), who worked in Bahia, Brazil. A former student of Athanasius Kircher, he taught in Portugal at the colleges of Lisbon and Elvas before travelling to Brazil.[51] Stansel refers to astrology in the southern hemisphere in his book *Uranophilus caelestis peregrinus sive mentis uranicae per mundum sidereum peregrinantis extases*

[49] Figueroa, op. cit. (43), fol. 114r.

[50] Figueroa, op. cit. (43), fol. 114r: 'porque la virtud, y eficácia de las Estrellas se halla em la Ecliptica en los grados analogos, que las corresponden, com que sus qualidades sempre han sido conocidas por sus efectos, quando algunas no ayan sido vistas em outras partes, por sus varias declinaciones, por la diversidade de los meridianos, y por la latitude de las regiones. Y semejantemente en las prouincias del Artico ay algumas Estrellas, que tambiem se ocultan a outros lugares de sus mesmas regiones, sin que jamas se aya dudado que sus qualidades estàn conocidas, como incorporadas en los doze Signos, en quien todas las Estrellas del firmamento estàn inclusas, y sus influencias experimentadas por la generalidad de cada Signo'.

[51] Carlos Ziller Camenietzki, 'Esboço Biográfico de Valentin Stansel (1621–1705), Matemático Jesuíta e Missionário Na Bahia', *Ideação* (1999) 3, pp. 159–82; Carlos Ziller Camenietzki, 'The celestial pilgrimages of Valentin Stansel (1621–1705), Jesuit astronomer and missionary in Brazil', in M. Feingold (ed.), *The New Science and Jesuit Science: Seventeenth Century Perspectives*, Dordrecht: Springer, 2003, pp. 249–70; Ribeiro, op. cit. (11), pp. 224–32.

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(1685).[52] Here, he follows the type of narrative used by Kircher in his famous *Iter coelestium*, where the main character discusses several subjects with a supernatural being – in Stansel's case, the muse of the heavens, Urania, and that of the Earth, Geonisbe.[53] When discussing the astrological canons of medicine, the muse Geonisbe asks Urania,

> How can the force of the heavenly bodies and the bad influence of the stars be known to us who live in America? Is there the same force of the stars in America as in Europe and on the Asians and the Africans? And who, I would love to know, teaches that force after so many periods of years and centuries, and (what is more difficult) to those who are located under a different inclination of the Sky, than [the one] the Chaldeans or the Arabs once observed? And, after so many years, are we ignorant of how big a difference results from the slanting of the parts of the sky and the curvature of the World? And then, if one can find out if those stars of which you have spoken, cause somewhere pleasant weather and somewhere else violent storms; if for [people in] the North mostly winds turbulent with clouds and frost seize the day, while in Brazil the Etesian and the Favonius [winds] blow (serene air and mostly empty of clouds), how can anything certain be found out from these by the Brazilians, or anything be learnt about diseases? If we see that some things are produced by the stars in the Chaldeans and the Arabs and other things in the Sarmatians and Gets, and again other things in our Brazilians, do we not correctly argue that the influence of the stars is not the same under this and another curvature [latitude] of the sky? And if this is not the same, how can a Brazilian or American physician determine anything from the stars, or consult them? If he cannot, it becomes clear that your canons rest on a dubious foundation, and what comes out from there; and we do not declare correctly the physicians are accused of homicide if they do not heal diseases at the right or the wrong time.[54]

Even as late as 1685, Stansel seems somewhat uncertain about this. Perhaps he was caught between the practical evidence that he himself experienced in Brazil and the views of Kircher, his mentor. Whatever his reasons, he does not reveal his position. Yet, despite his apparent concerns, Stansel produced judgements of comets, using visual allegory to interpret constellations; reports from the period also suggest that he made medical prognostications.[55]

[52] Valentin Stansel, *Uranophilus Caelestis Peregrinus sive Mentis Uranicae per Mundum Sidereum Peregrinantis Extases*, Gand: Apud Heredes Maxìmiliani Graet, 1685; Valentin Stansel, *Uranófilo, o Peregrino Celeste ou os êxtases da mente urânica peregrinando pelo mundo das estrelas* (tr. Carlos Ziller Camenietzk), Salvador: Edufba, 2021.

[53] Camenietzki, op. cit. (51); Stansel, op. cit. (52), pp. 11–35.

[54] Stansel, op. cit. (52), pp. 20–1: 'Quo pacto, inquit, vis Siderum, aut malignitas Stellarum cognosci à nobis possunt, qui Americam incolimus? An verò eadem vis Astris in America, quae in Europa; eademque in Asiaticos, quae in Africanos? Et quis, amabo, hanc vim, post tot annorum & seculorum periodos, & (quod difficilius) sub alia Caeli, quàm Chaldaei vel Arabes olim observarunt, inclinatione positos, docuit? An verò nescii sumus, quanta, post tot annorum curricula, partium Caeli, ex devergentia & convexionibus mundi, varietas facta sit? Denique si haec ipsa Sidera, de quibus dicebas, alibi tempestatem placidam, alibi violentam & turbidam faciunt; si Borealibus plerumque squallentes nubibus venti & pruinae diem eripiunt, quo tempore Brasilis Etesiae vel Favonii spirant (sereno ut plurimùm aëre & à nubibus vacuo) quo pacto certi aliquïd ex iis à Brasilis erui poterit, aut de morbis decerni? Si alia in Chaldaeis vel Arabibus, alia in Sarmatis Getisque rursumque, alia in nostris Brasilis, ab Astris effici videmus, an non rectè arguimus, sub alio atque alio Caeli curvamine, non eumdem esse Siderum influxum? Quòd si autem non idem est; quo pacto Medicus Brasiliis sive Americanus, ex Astris aliquid statuere, aut ea consulere poterit? Quod si autem non potest, liquidum sit, tuos illos canones dubio niti fundamento; & quod exinde nascitur, non satis rectè Physicos homicidii reos pronuntiamus, quod vel non in tempore aut intempestive morbis medeantur.' My translation.

[55] Ribeiro, op. cit. (11), pp. 230–2.

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Since antiquity, the association of a comet with a particular planetary nature was dependent on its visual appearance and on the celestial configuration (usually conjunctions) preceding its appearance. In a way, this practice would reiterate the idea that the intrinsic nature of celestial bodies is not affected by the observer's position, as argued by defenders of universality. However, in none of the previous authors' debates would this have made a good argument for the universality of astrology.[56] The unresolved nature of this matter can also be seen in 1702 in the texts of another Jesuit, Luís Gonzaga, who taught mathematics in Lisbon, Portugal. In his astrological lessons, he briefly refers to Kircher's ideas on the change in the nature of the astrological signs for the southern and torrid regions. However, once again, he does not discuss the practical implications of the system.

This initial overview also reveals that the Portuguese, Spanish and Dutch were more frequently conversant with southern astrological charts. Unfortunately, aside from the printed sources presented here – a handful of almanacs, pamphlets and one book, there is an uncomfortable silence in early modern evidence. So far, only two Spanish sources have explored this matter in depth. All others are Italian, German and French.

In this matter, there are two views on the functioning of astrology. First is the localized view of astrology, which requires its theory and practice to adapt to each specific region, as advanced by Cardano, Campanella and Kircher. The second view treats astrology as universal, adhering to the same principles in any region of the globe, as supported by Martínez, Morin and Figueroa. Authors from both perspectives consolidate their proposals with logical reasoning, considering both the traditional rules and the new empirical information from the New World. However, there is a clear divide. Those advocating the localized view are Europe-based, and their perspective is purely theoretical. They provide no empirical examples of astrology functioning in the manner they propose. Kircher's testimonies from those who had travelled south pertain to differences in climate and the seasonal cycle, not to astrological practice. Those who adhere to the universal nature of astrology are the practitioners such as Martínez and Figueroa, who actually lived in colonial territories, together with those who adopted an empirical approach to the problem, using evidence derived from the colonies, such as Morin.

In other words, this debate was one between European-based theoreticians and the colonial practitioners who actually needed to apply those theories in the southern hemisphere.

None of the astrological figures and judgements for the southern hemisphere observed during this research evidence any application of the inversion theories proposed by Campanella and Kircher. Even considering that astrological charts are a little-studied source, particularly for the southern hemisphere, the existing examples – including several cometary judgements – show no change in the elemental qualities of the signs or planetary rulers. Thus experimentation by astrologers and physicians in practice overruled the theoretical models proposed, corroborating a universal use of astrology where the same principles were applied independently of the region of the globe. Most of the process of adjustment of astrological doctrine to the southern hemisphere aligns with Grafton's views on the transmission and adaptation of traditional knowledge. Even when other changes can be observed in astrological practices, and despite such an important challenge regarding one of its core foundations, the astrological doctrine did not change. Nonetheless, the debate on the universality of astrology and the inversion theory shows a different movement. While experience challenged the established concepts and suggested new explanations, at the same time the authors used astrology's own traditional

[56] Although there are a few exceptions, in many seventeenth-century astrological texts comets are still explained as sublunary phenomena. When viewed as celestial objects, they are considered exhalations from the planets, thus acquiring the planet's quality.

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Aristotelian background to support the empirical evidence and overcome the difficulties in reconciling experience with astrology's classical Ptolemaic rationale.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/S0007087425000159.

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