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CHAPTER TWO

KEPLER'S EARLY CAREER IN ASTROLOGY, 1594–1599

In 1594, Kepler was summoned to the Protestant seminary in Graz before completing his studies in theology at the University of Tübingen. There in the Styrian capital, Kepler was responsible for teaching mathematics and publishing astrological calendars. At the time, the mathematical curriculum was commonly divided into four parts, arithmetic, astronomy, geometry, and music, together known as the 'quadrivium.' Astrology, an essential part of astronomy, involved the observation of causes and effects widely considered as the "ordinances of God."[1] It has been correctly said that astrology, as taught in the quadrivium, "was part of a complete philosophical system of the world,"[2] and Kepler certainly saw it that way. The basic principles of astrology, however, were applied in different ways, depending on different areas of interest: medical astrology relied on celestial configurations for the administration of medicine and the diagnosis of patients; judicial astrology foretold the fates of individuals, groups, and nations; electional astrology sought to 'seize the moment,' determining the best occasions for holding important events; natal astrology predicted, sometimes retrospectively, the accomplishments and characteristics of individuals according to their natal chart, their personal map of the positions of the planets at their time of birth; horary astrology explored particular queries according to the 'birth' of the question and the natal chart of the questioner;[3] and astrometeorology considered the sympathies, often realized in the form of weather conditions, between the sublunar and celestial spheres.[4] Whether for the treatment of illness, the prediction of political uproar, or the forecast of major meteorological events, astrology in much of early modern Europe was thought to put

[1] Methuen, 1998, pp. 77–78.

[2] Field, 1984b, p. 190.

[3] Girolamo Cardano (1501–1576) claimed that this form of astrology was "accidental, against our law, and . . . the cause of many evil things." Cardano studied several queries, however, covering every subject from the life and death of a ruler to the sex of a baby. In his study, he often urged his readers also to take into account factors external to astrology. See Cardano, 1966, pp. 553–560.

[4] For an introduction to the various areas of astrology and their shared study of celestial influence, see Campion, 2009; Tester, 1987; Bouché-Leclercq, 1979.

practitioners in touch with divine decrees. And for scholars such as Girolamo Cardano (1501–1576), astrology was "more delightful and divine than any other discipline."[5]

At first, Kepler saw his position in Graz as a temporary obligation to fulfill before returning to Tübingen to complete his studies in theology.[6] Soon, however, he discovered that his research in astronomy could reveal another form of learned reverence. Inspired by the discoveries that led to his first major publication, the *Cosmographical Mystery* (1596), Kepler described himself as a priest who studied "the book of nature," the work of the divine creator glorified by the astronomer. Conceiving this role as complementary to the study of Sacred Scripture, Kepler invested profound importance in the study of the stars. He expressed this view in a letter to Herwart, where he made clear his goal as the glory of the creator:

> Yet I am of the opinion that, since we astronomers are priests of the highest God with respect to the book of nature, we do not promote the praise of the intellect but above all behold the glory of the creator. He who is convinced of this does not easily bring to light anything other than what he himself believes, nor does he abruptly alter anything in [astronomical] hypotheses unless he hopes that from them the phenomena can be demonstrated with greater certainty.[7]

Kepler's sketch of the astronomer's role contains a scathing critique of those whom he saw as the clever combiners of "ancient hypotheses and the new ones of Copernicus."[8] Kepler argued that astronomers such as Tycho Brahe (1546–1601) and Nicolaus Raimarus Ursus (1551–1600) had wrongly viewed their vocation as "outshining those two great luminaries, Ptolemy and Copernicus."[9] Their suggestion of a 'compromise system,' Kepler wrote, was a vain attempt to surpass these authorities "in the glory of invention" rather than faithfully grasp and glorify the work of their creator.

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[5] Cardano, 1966, p. 728; cf. Grafton, 2000.

[6] Kepler's summons to Graz has been described as "a bitter personal struggle" that left the aspiring theologian "torn between his calling and his duty." See Voelkel, 1999a, p. 23.

[7] *JKGW*, 13, 193.14–19: "Ego verò sic censeo, cum astronomi, sacerdotes dei altissimi ex parte libri naturae simus: decere non ingenii laudem, sed creatoris praecipuè gloriam spectare. Qui hoc sibi persuasum habet, is non facile aliud quicquam in lucem emittit, quàm secum ipse credit, nec temerè quid in hypothesibus mutat, nisi certius ex illis phaenomena demonstari posse speret."

[8] Ibid.

[9] Ibid. Kepler also named Philip Lansberg, Giovanni Antonio Magini (1555–1617), and Helisaeus Roeslin.

How did Kepler's divine vision of astronomy relate to his view of astrology? First, it is important to note that Kepler occasionally took great pains to differentiate between astrology and astronomy. At one point, Kepler described the popular practice of astrology as "a foolish daughter" whose "mother, the most reasonable astronomy," relied on predictive principles rather than the particular circumstances of people.[10] Those who pretended to project "their foreknowledge onto the future contingencies of individuals," Kepler proclaimed, were nothing more than "godless philosophers and physicians."[11] In 1599, Kepler briefly outlined what would eventually become the five books of his *Harmony of the World* (1619), corresponding to geometry, arithmetic, music, astrology, and astronomy, respectively. Describing the final, astronomical book as the study of "the causes of the periodic motions," Kepler assigned to astrology, the focus of the fourth book, the consideration of "the causes of the planetary configurations."[12] Second, despite the certainty Kepler so often attributed to mathematical knowledge, he appears to have allowed for plenty of uncertainty in astrology.[13] It may well be argued that Kepler's astronomy, burdened by a potentially boundless number of archetypal principles, was similarly plagued by the specter of incertitude,[14] but there can be no mistaking what Kepler claimed to be two very different degrees of demonstrability. Kepler often compared astrology to the imprecise art of the physician, advanced by the accumulation of knowledge about physical qualities. Just as the physician would continue gaining greater familiarity with "the many and various herbs," Kepler wrote, so would the astrologer continue developing "a discrete science [*scientia*] and body of knowledge" about the natural properties of the planets.[15] In either case, greater experience gave way to a measure of consistency that served as a basis for "bearing out the causes."[16] Whether or not Kepler held out the possibility of improving the precision of astrology, however, he did not anticipate

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[10] *JKGW*, 4, 161.9–17.
[11] Ibid., 181.26–27.
[12] *JKGW*, 14, no. 148, 18–19.
[13] On the element of uncertainty in Kepler's astrology, see Rabin, 1987, p. 157.
[14] On the role of archetypal principles in "Kepler's construction and defence of his physical astronomy," see Martens, 2000, pp. 97–98, 146–168. On the ambiguous identity of Kepler's archetypes, see Donahue, 2002, p. 297.
[15] *JKGW*, 4, 177.18–25.
[16] Ibid., 164.9–15.

perfecting his practice anytime soon. And the greater goal of arriving at the causes of influence remained even farther in the future.[17]

Yet despite the many differences Kepler identified between astrology and astronomy, he claimed the two shared in geometry the same metaphysical foundations. As a consequence, Kepler applied geometrical principles to the two areas by way of analogy.[18] He also extended these principles to the study of music. In fact, Kepler argued that all material phenomena, from the motions of the planets to the effects of the heavens on the weather to the production of particular melodies, derived from the same singular set of geometrical principles. Seen in this way, astrology, astronomy, and music shared the same archetypal origins. Kepler even described astrology as "a silent music" whose appreciation was made possible by a soul that could "dance to the tune of the aspects."[19] As Kepler made clear, the universal nature of geometrical principles accounted for the underlying consistency of the cosmos, where the idea of harmony encompassed far more meaning than our modern understanding. On the occasion of accepting three new aspects as influential, Kepler wrote to Herwart in 1599 on his discovery of an "absolute analogy" between astrology, astronomy, and musical theory:

> . . . The analogy [*analogia*] with music and astronomy is absolute. I show that the analogy must necessarily be seen in this way, since the origins of all things are derived from geometry. Nature confirms these principles in the creation of a single species and employs these principles in everything that is capable of them. This occurs in music, the motions of the planets, the operation of the planets [on earth], the measure of musical notes according to time, the dances of men, and the composition of songs. For although these things are the discoveries of men, nevertheless man is the image of the creator.[20]

[17] Kepler also claimed he might not fully comprehend the causes of influence when he finally came to consider them. See ibid., 164.14–15.

[18] Originally intended by Plato to refer to a mathematical proportion (*ἀναλογία*), the word *analogia* came to signify in ancient and early modern Latin "a method of reasoning from parallel cases." See the *Oxford Latin Dictionary*, 1985, p. 126.

[19] *JKGW*, 11,2, 48.23–28; cf. Bialas, 2004, p. 141.

[20] *JKGW*, 14, no. 130, 640–651: ". . . perfecta sit analogia musices et astronomiae. Quam analogiam necessariò spectandam hoc medio demonstro, quia omnium rerum origines ex geometria petitae sunt, et quas natura rationes probat in creatione unius generis rerum easdem adhibet in omnibus omninò rebus, quae earum sunt capaces. Propterea in musica, in motibus planetarum, in operatione planetarum, in dimensione notarum musicalium causâ temporis, in hominum saltationibus, in ratione carminum. Nam etsi sunt haec hominum inventa, tamen homo imago conditoris est."

Kepler's association of astrology and astronomy was not only ontological. He claimed that humanity had been intellectually equipped with the very principles underlying both of these mathematical branches. And although these principles appeared to be human discoveries, their conception was no mere coincidence. Man, created in "the image of the creator," had found them as a consequence of his natural character. Kepler argued that knowledge of archetypal principles had not come about by choice, since "the measure of nature" was not determined by "the election of man."[21] Rather, archetypal knowledge was a reflection of our very essence. Seen in this way, the material world exemplified certain principles already present to our intellect. Stemming from the same general system, astrology and astronomy suggested a set of intellectual tools whose practitioners stood on the same epistemological scaffolding. It is for this reason that Gérard Simon would not ultimately distinguish between Kepler "the reformer in astrology" and Kepler "the renovator of astronomy."[22]

Not All Astrologers Created Equally: Kepler's Perception of His Practice

It is clear from his early correspondence that Kepler did not claim for astrology the accurate determination of anything.[23] He issued calendars annually and wrote at length on astrology, yet Kepler rarely passed up the opportunity to point out the many problems of his practice. Particularly problematic were those whom Kepler saw as the astrological counterparts of empirics and quacks in the world of medicine. Surrounded by so many promoters of falsehood, Kepler openly preferred to pursue "other, more agreeable and more vital studies" than astrology, despite his professional obligations.[24] Calendars and the composition of birth charts brought him material benefits, but he did not deem it "disgraceful to disregard certain axioms of the astrologers" which would doubtfully improve his own practice.[25] Kepler pointed out, for example, that previous scholars such as Johannes Schöner (1477–1547), whose astronomical tables featured a famous defense of astrology by Melanchthon, had chosen from among "an

21 *JKGW*, 13, no. 123, 366–367.
22 Simon, 1975, p. 447; cf. Kusukawa, 1995, p. 188.
23 On the general nature of Kepler's astrology, see Rabin, 1997, p. 753; 1987, pp. 191–192.
24 *JKGW*, 13, no. 123, 611–612.
25 Ibid., 612–614.

enormous magnitude of astrological volumes" when selecting their own "frivolous foundations."[26] Kepler considered much of astrology to have been corrupted by the contributions of countless practitioners whose efforts had obscured an original core of truth.

With this conviction in mind, Kepler compared his role in astrology to that of the religious reformers of the day. Like those reformers, Kepler sought to separate the chaff of human corruption from the kernel of truth. How he went about doing this, he explained, did not recall the methods of the Jesuits, whose missionary efforts had been mixed up with many frivolous practices. Rather, Kepler modeled his reform of astrology on the Lutherans, who had removed several trivial traditions in arriving at firmer theological footing. In a letter of 1598, Kepler made use of this comparison to gain the sympathy of his mentor and former astronomy instructor at Tübingen, Michael Mästlin (1550–1631). In an earlier letter, Mästlin had questioned Kepler's choice of context when expressing his critical views of astrology in his calendars. Quick to note the nobility of his cause, Kepler drew a parallel between his critique of astrology and the integrity of his Lutheran brethren:

> Noble instructor, can it be that I do not act properly if I devote my work to persuading scholars and even philosophers of a distinct operation of the heavens? Here, I act as the Jesuits, who amend many things in order to make men Catholics. Nevertheless, I do not act in this way, for those who defend every frivolity resemble the Jesuits. I am a Lutheran astrologer, who casts aside frivolities and preserves the kernel.[27]

Kepler's self-portrayal as a "Lutheran astrologer" may appear inopportune to us. Although Luther had allowed that some celestial configurations could herald the judgments of God, he had condemned astrology as incompatible with divine omnipotence.[28] It seems more appropriate to interpret Kepler's comparison according to the manner in which Luther's reform of the Christian religion related to Kepler's self-proclaimed role in the restoration of astrology. Kepler saw his simplification of astrology to a select set of geometrical principles—a return to astrology's roots—

[26] Ibid., 607–610.

[27] *JKGW*, 13, no. 89, 173–178: "Optime praeceptor, an non rectè ago, si operam do, ut doctis et philosophis etiam operationem caeli persuadeam distinctam? Ago itaque ut Jesuitae: qui multa emendant ut homines catholicos faciant. Imo non ita ago, nam qui omnes nugas defendunt sunt Jesuitis similes, Ego sum Lutheranus astrologus, qui nugis abjectis retineo nucleum."

[28] Dixon, 1999, pp. 408–409.

as analogous to Luther's removal of the many "frivolities" that Catholicism had contrived to conceal the original core of Christianity. Comparing the customs of Catholicism to the conventional rites of astrology, Kepler likened the idolatrous worship of saints to such things as the system of houses. In both cases, he claimed, human invention had obscured the original source of conviction. Whether or not we should consider Kepler's efforts as an attempt "to make astrology a natural science,"[29] it is clear that astrology shared with his other areas of interest an underlying objective to eliminate what he saw as strictly cultural conventions. Such things as the divisions, names, and various properties of the zodiac were identified as the astrological equivalents of what Kepler considered in Christianity the adverse accumulation of human custom. Kepler, like Luther, sought to strip away these customs, revealing a simplified body of sound doctrine.

Comparing his endeavors in astrology to the Lutheran reform of religion, Kepler frequently failed to convince others. His attempts were more often seen as outright assaults that would isolate astrology from its original foundations. As we have recently seen, Kepler was also prone to choosing the wrong places to express his critical views. In his letter of 1598, Mästlin had informed Kepler that the venue his former pupil had chosen to communicate his criticism was questionable. Mästlin and "not some few others" had wondered why Kepler had attacked astrology so strongly in his calendar of 1598, having made so little criticism in the *Cosmographical Mystery*, where Kepler "would have been able to argue only with the learned."[30] The "useless tools of the numbered houses and the arrogant presumption of predicting particular things" were expressly condemned in his calendar,[31] while Kepler had simply assumed these same things in select chapters of the *Mystery*. The result, Mästlin had claimed, was a calendar whose critical content fell on the deaf ears of his audience. Without objecting to Kepler's views, Mästlin had opposed the place his former pupil had chosen to air his opinion:

> For [the calendar] is done for country folk and the uneducated, who neither expect nor observe such arrogant presumption, but rather predictions about the annual harvest, war, and other things of this sort. In fact, those people

[29] Simon, 1975, pp. 440, 444. Cf. Field, 1984b, p. 220: "As we have seen, what seemed 'nonsense' and what 'kernel' did change over the years, so that the *Confessio Augustana* of Kepler's alleged astrological Lutheranism was more a collection of principles than a definite body of dogma."

[30] *JKGW*, 13, no. 97, 47–53.

[31] Ibid., 50–53.

> do not grasp the foundations of the principles of the twelve houses of the zodiac, the triplicities, etc. Yet I shall now keep quiet about the matter. You see that I have not opposed your opinion, only that it seems to me to have been put forward in an inappropriate place, that is, in a prognostic [*prognosticum*], which lasts a single year, while other written works, in which the material could have been discussed with greater facility, are everlasting.[32]

In his response to Mästlin later the same year, Kepler described the circumstances differently. With only 400 to 600 calendars published, Kepler saw little concern for his commentary reaching a wide audience. As a consequence, Kepler composed his calendars mainly for "nobles and prelates," who claimed for themselves "some knowledge of things" which they did not actually know.[33] The end result might still have been the same, that is, Kepler might still have not won any followers, but it is worth noting that he was willing to direct his efforts of reform to an audience of potential patrons. Kepler carefully distanced himself in his calendars from those astrologers whom he considered "frivolous," the consumers of convention, and focused on the few principles which he believed were based on reality rather than ritual.[34] If his approach won him few followers, it proved even less profitable when it came to producing patrons. As Kepler explained to Mästlin, his salary had seen no significant increase since he had begun composing calendars:

> In all of my prognostics [*prognostica*], I try to provide from ready convictions that seem to me true a certain taste of the delightfulness and greatness of nature to my readers . . . If perhaps they are moved to support me with as great a salary, this has yet to come to pass . . . If you accept these things, you shall no longer be angry with me, for I am a protector of astrology through my words and work, and yet I continue to strive to implant the opinion in the minds of men that I am not a frivolous astrologer.[35]

[32] Ibid., 56–61: "Hîc enim cum rustica plebe et idiotis, à quibus non arrogans illa praesumptio, sed prognostica de proventibus anni, de bellis, et quae eiusmodi sunt, expectatur, aut spectatur, agitur. Etenim his ignota sunt fundamenta rationum 12 domorum coeli, triplicitatum, etc. Sed de his etiam quiesco. Vides me mentem tuam non impugnasse, sed quod mihi videatur, eam impertinenti loco fuisse propositam, nimirum saltem in prognostico, quae durant unum annum, cum alia scripta, quibus illa materia commodius tractari potuisset, sint perpetua."

[33] *JKGW*, 13, no. 106, 61–63. For an analytical summary of Kepler's response to Mästlin, see Sutter, 1975, pp. 297–298.

[34] Steven Vanden Broecke suggests that many proposals for astrological reform served as "boundary markers, through which elite practitioners distinguished themselves from competing 'popular' practitioners." See Vanden Broecke, 2003, pp. 262–270.

[35] Ibid., 68–75: "In omnibus prognosticis id ago, ut de promptis sententiis, quae mihi verae videntur, gustum aliquem jucunditatis et majestatis naturae praebeam . . . meis lectoribus . . . si forte per hoc excitentur ad me tanto majori cum salario alendum, cujus nulla

Kepler did not explain to Mästlin why he chose to critique astrology in his calendar. Instead, he attempted to convince his mentor that he had chosen an appropriate context. Kepler did not believe in such "frivolities" as predicting political revolutions: the sequence of seasons was "one thing, humankind another."[36] Kepler felt it necessary to explain why he had spoken out against these things in his annual prognostic. Lamentably, his lack of frivolity in astrology was accompanied by an equally sparing financial state, and he appears to have held out little hope that his patrons, allured by the "delightfulness and greatness of nature" found in his calendars, would improve his circumstances notably. Yet despite the many things in his calendar that required an apology, Kepler refused to repress his opinions. His skeptical view of astrology stemmed from the same foundational principles at the heart of his cosmology. If many of his readers could neither understand nor appreciate the philosophical roots of his astrology, Kepler did not allow their interests to determine the depth or direction of his analysis.

To lend measure to the magnitude of his critical attitude towards astrology, Kepler expressed little interest in examining the growing literature on the subject. In a letter of 1599, Kepler compared his ignorance in astrology to the ignorance of Ursus in astronomy. Suspecting he was guilty of the same crime that Ursus had committed by mixing up the major hypotheses in astronomy, Kepler threw up his hands and simply surrendered to the possibility that he was unaware of widely held principles. "When I weigh the enormous number of volumes of the astrologers," Kepler wrote, "I suspect that I am doing the same thing in astrology that Ursus does in astronomy."[37] Through his comparison, Kepler accused Ursus of not actually reading those authors whose theories he had wrongly related in his book, *On Astronomical Hypotheses* (1597). Kepler claimed he was equally unprepared when it came to "some of the axioms of the astrologers."[38] The price of his ignorance, however, was far less than the damage done by Ursus. Kepler was occupied by other areas of study he described as "more delightful and less dispensable," in particular astronomy.[39] Kepler excused his ignorance in astrology as something he did not view

adhuc accessio facta . . . Haec si probaveris, jam porrò mihi non succensebis, quod assertor astrologiae cùm sim verbis et opere, studeam tamen hanc animis hominum existimationem implantare, non esse me nugacem astrologum."

[36] Ibid., 78–80.

[37] *JKGW*, 13, no. 123, 607–611.

[38] Ibid., 613.

[39] Ibid., 612.

as disgraceful. If this was a matter of priority, he would not sacrifice his study of astronomy to cover the last couple of centuries of astrological literature. On the contrary, Kepler claimed that this literature only shrouded astrology further beneath the shadows of convention. Slimmed down and simplified, Kepler's astrology called for a return to the timeless principles of geometry apart from human history.

Through his close involvement in the controversy between Tycho and Ursus, Kepler would become closely familiar with Ursus's skeptical view of astronomy. Contracted to work for Tycho under the obligation that he provide a defense for his patron, Kepler would set out in 1600 to undermine Ursus's misrepresentation of astronomical hypotheses. Angered by Ursus's view of their validity, Kepler declared in his *Defense of Tycho against Ursus* that "false hypotheses, which together yield the truth once by chance, do not in the course of a demonstration in which they have been combined with many others retain this habit of yielding the truth."[40] When Kepler moved on to the observational equivalence of competing systems of prediction, he determined their differences according to physical considerations. "Thoughtless" astronomers were condemned for adhering strictly to the numbers and suggesting that "the same result follows from different hypotheses."[41] For Kepler, emphasis on the physical implications of astronomical hypotheses allowed him to distinguish between competing systems and curtail the criticism of skeptical adversaries such as Ursus. In his attention to qualitative considerations, Kepler attributed particular importance to the physical principles of coherence, simplicity, and precise archetypal patterns.

Tying Ursus's ignorance to his skepticism, Kepler condemned him of a crime whose consequences were far greater in astronomy than in astrology. Kepler's higher regard for astronomy is often the focus of historical fiction, where he is described as neglecting his astrological duties at the price of his annual pay.[42] We may even imagine the young Kepler struggling at times with his calendars while savoring his time spent on the "more delightful" astronomy. Although some historians have painted a similar picture,[43] it is important to note that Kepler questioned the con-

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[40] Jardine, 1984, pp. 89, 140.

[41] Ibid., pp. 90, 141.

[42] See, for example, Luminet, 2009, p. 295, where Kepler is issued an official warning and "a fine of two florins for every day" his calendar of 1596 is delayed. Under the obligation of authority, Kepler is torn from his *Cosmographical Mystery* "like an angel hurled from the highest star to the mire of a meaningless zodiac."

[43] See, for example, Tondorf, 1904, p. 303.

temporary practice and not the validity of astrology. He allowed for a certain degree of ignorance of astrology because he doubted the propriety of popular practice rather than the reality of celestial influence. Kepler also saw little point in forecasting the actions of individuals whose fickle paths proved far less foreseeable than the perennial motions of the planets. As testimony to astrology, Kepler pointed to the influential properties of a particular group of geometrical archetypes. According to Kepler, the cosmos had embodied these archetypes since the original act of creation, allowing for a form of interaction between the celestial and sublunar spheres. Kepler claimed that these archetypes were exemplified by certain configurations of the planets, which, as a source of stimulus in the sublunar sphere, led to different responses in human behavior, disease, and other earthly events. How the earth and her human inhabitants responded to these configurations was a highly complex matter.

Conserving the Kernel: Kepler's Early Conception of the Astrological Aspects

What did Kepler mean by the metaphysical archetypes he saw as so essential to understanding astrological influence? We know that Kepler's view of these principles changed with time,[44] so how did he conceive of them after completing the *Cosmographical Mystery*? In April 1599, Kepler gave an answer to this question in a long letter to Herwart. Described as a "scholar of great energy, if little judgment,"[45] Herwart wrote regularly to Kepler through a network of correspondence involving several other potential readers. The letters exchanged by Kepler and Herwart were first dispatched to the imperial court in Prague, where various dignitaries could read them. An ardent Catholic and outspoken statesman, Herwart ensured that his correspondence with Kepler passed before the eyes of numerous non-Protestants. This arrangement has been seen as having "raised Kepler from the mass of his colleagues," earning him "special consideration with the ruling Catholic party."[46]

In a letter of March 1599, Herwart asked Kepler to help him sift through "the Arabic frivolities" surrounding astrology and find "the philosophical

[44] On Kepler's conception of the aspects over the course of his career, see Bialas, 2004, pp. 139–144.
[45] Grafton, 1991, pp. 187–189; 1997, p. 198.
[46] Caspar, 1993, pp. 69–70.

pearls."[47] Having recently come across a book by Heinrich Rantzau (1526–1598) and several other titles on the subject, Herwart solicited the services of the young mathematician as he made sense of the many authors who had written about astrology. Herwart also asked about their observational sources. In his response a month later, Kepler began by affirming the interaction of the celestial and sublunar spheres through ordinary observation. As he described it in a marginal note he made in Herwart's letter, this interaction involved a "connection between the heavens and earth and the effects flowing from it."[48] Kepler also mentioned the work of Aristotle as relevant to the matter, while Ptolemy, "led astray by the fables of fools," was described as "having neglected nature."[49] "Aristotle considers those philosophical pearls in his books *On Generation and Corruption* and *Meteorology*," Kepler wrote, "and I have pointed out some of them in the preface of my prognostic for this year, which you have."[50] Kepler also cited such things as the association of terrestrial vapors "with the light of the moon" and the sequence of the tides "according to the motion of the sun and the moon" as evidence of an influence from beyond the lunar orb.[51] As his most significant source of evidence, however, Kepler suggested the aspects, those configurations of the planets whose effects on the sublunar sphere derived directly from the metaphysical archetypes.

In his letter to Herwart, Kepler outlined eight influential configurations of the planets. Also known as 'aspects' or 'planetary radiations,' these configurations conveyed influences "by way of reason."[52] Seen as the center of a circle whose circumference corresponded to the zodiac, the earth served as the principal reference point for the planets. Although Kepler accepted the motion of the earth, it remained always at the center of this circle while the planets continued moving around the circumference. Latitudinal motion did not play a part, as Kepler conceived the circle, and consequently the positions of the earth and the other planets, in terms of two dimensions. When two planets became separated by a certain distance or angular section with respect to the central reference point, an aspect was momentarily formed. Since the planets proceeded on their paths almost continually, an aspect often passed into obscurity as soon as it came into

47 *JKGW*, 13, no. 114, 110–113.
48 Ibid., 221–222.
49 Ibid., 220–225.
50 *JKGW*, 13, no. 117, 193–196.
51 Ibid., 201–203.
52 Ibid., 203–204.

existence. Kepler listed the aspects in order of ascending angular separation: conjunction (0°), sextile (60°), quintile (72°), quadrature (90°), trigon (120°), sesquiquadrature (135°), biquintile (144°), and opposition (180°).[53] Each of these aspects found a musical counterpart among "the eight harmonies."[54]

Five of the eight aspects were originally outlined by Ptolemy,[55] the leading authority of early modern astrology.[56] These configurations, conjunction, sextile, quadrature, trigon, and opposition, were the cardinal configurations. According to Kepler, they surpassed in influence the three new aspects he had introduced, quintile, sesquiquadrature, and biquintile.[57] These new aspects were based on "the same reasoning" that underlay "those time-honored and traditional ones."[58] Kepler called on natural philosophers to inquire after the validity of every aspect by observing the weather regularly. The sudden onset of certain conditions at the sign of an aspect, he claimed, was clear evidence that the heavens played a part in earthly affairs. Kepler had collected evidence in favor of the new aspects since 1594, having compared their occurrence "with recorded storms."[59] This influence did not result from the light radiated by the sun or reflected by the planets, however, but from the nature of their separation at a particular point:

> You see, today when two planets are separated by 89°, nothing new occurs in the weather [*meteoris*]. Tomorrow, when they are separated by fully 90°, that is, [when they are] in quadrature, a storm suddenly arises. What little light arrives from these two planets in a single day, and how can it be reduced so suddenly tomorrow? Thus, this is not the effect of any number of stars nor of light, but the sum of 90°, that is, the angle from the rational number 90°, a harmonic part of a complete circle.[60]

53 Ibid., 209–211.

54 Ibid., 206–207.

55 See Ptolemy, 1940, pp. 72–73.

56 On the importance of Ptolemy in Melanchthon's transformation of the educational curriculum in Lutheran institutions of learning, see Methuen, 1998, pp. 97, 219.

57 *JKGW*, 13, no. 117, 211.

58 Ibid., 212–213.

59 *JKGW*, 14, no. 132, 351–352.

60 *JKGW*, 13, no. 117, 213–219: "Ecce hodie cum distant planetae duo 89 gradibus, nihil novi fit in meteoris. Cras cum distant plenis 90°, sc: quadrante, subito oritur tempestas. Quantula luci utriusque facta est accessio intra unum diem, et quomodo perendie illa minui statim rursum potest? Igitur non stellae est is effectus, sed stellarum, non lucis, sed numeri 90°, hoc est anguli per numerum 90° rationalem, et harmonicam totius circuli partem . . ." The term *meteora* has been taken to refer to 'the conditions of the weather.' Here, it appears to stem from the original Greek '*μετέωρα*,' 'rising up, levitating,' which referred

Kepler argued that an angle produced by the separation of two planets by "the sum of 90°" led to a change in atmospheric events. The metaphysical nature of this phenomenon suggested to him "a soul in the earth fit for understanding those aspects [*apta ad intelligendos hos aspectus*]."[61] Although Kepler employed observational support for the three new configurations, he considered this metaphysical line of reasoning as more compelling evidence.

In a later letter to Herwart, Kepler linked each aspect to one of the eight ratios that were held as harmonic, unison (1:1), minor third (6:5), major third (5:4), fourth (4:3), fifth (3:2), minor sixth (8:5), major sixth (5:3), and octave (2:1).[62] Kepler made this connection by comparing the measure of the circumference cut off by a particular configuration with the circumference of the circle as a whole. The larger part of this proportion measured the whole of the circumference, while the smaller part measured the segment separated by the circumferential span of two planets (including the sun and the moon). Sextile, for example, cut off 60° or $^5/_6$ of the circumference, corresponding to the harmonic ratio of 6:5, the minor third. Opposition, which cut off 180° or $^1/_2$ of the circumference, resulted in the harmonic ratio of 2:1, the octave. The three new aspects, quintile (72°), sesquiquadrature (135°), and biquintile (144°), rounded out the group of eight and referred to the ratios of 5:4, 8:5, and 5:3, respectively. Kepler also illustrated in his letter to Herwart how the aspects achieved this agreement. Straightening the zodiacal circumferences of the eight aspects into a line, Kepler equated the angle of every planetary configuration with the ratio formed by a particular harmonic proportion.

In a letter of May 1599, Herwart questioned Kepler's account of the aspects. Diplomatic in tone, Herwart expressed doubt about rejecting "everything in astrology except for the planetary aspects."[63] Since "even the smallest foundation" in astrology would seem "to depend on sheer

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to every phenomenon regarded by Aristotle as an atmospheric occurrence produced by a mixture of moist and dry exhalations. In addition to those phenomena we continue to consider atmospheric, Aristotle classified comets, meteor showers, and shooting stars as *meteora* (Aristotle, 2004, 340b, 341b, 359b–360b, 370a). Although Kepler condemned this view of comets as "doubtful and untrue," he accepted all of the other *meteora* originally identified by Aristotle. On the multiple meanings of *meteora* in ancient Greece and Rome, see Taub, 2003, pp. 1–2.

[61] *JKGW*, 13, no. 117, 222–224.

[62] On Kepler's early coupling of the aspects and the consonances and his eventual rejection of their correspondence, see Simon, 1979, pp. 44–46.

[63] *JKGW*, 13, no. 121, 41–43.

superstition,"[64] Herwart urged Kepler to explain why he held on to what appeared to be only another false part of astrology. Herwart could simply not see why "many, if not an infinite number of aspects" could be introduced according to the same principles as Kepler's original eight.[65] Failing to find any logical way of limiting the number of aspects, Herwart invited Kepler to explain their distinct nature in greater detail. "I shall now keep quiet," Herwart finally wrote, "and leave out those things that can be raised against that refuge of writing horoscopes."[66] Despite his tact, Herwart did little to hide his doubt. Kepler would elaborate on the matter in the same place he would explain the common foundation of the aspects and the musical consonances.

Admittedly, the prospect of an infinite number of aspects had previously occurred to Kepler. He claimed to have resolved the matter in the *Cosmographical Mystery*, where he had distinguished the aspects from the twelve signs of the zodiac, the artifacts of "human design" that had "no basis in nature."[67] There, Kepler had also shown how the aspects held "something in common with the consonances."[68] Yet despite his reference to the *Mystery*, Kepler felt compelled to explain to Herwart why he accepted only eight aspects. "You object," he wrote to Herwart, "that there are an infinite number of aspects just as there are nearly an infinite number of harmonies."[69] In his letter of May 1599, Kepler acknowledged the possibility of an endless number of aspects as a problem previously discussed by several prominent authorities, including Ptolemy. At stake was the very distinction of the aspects according to their natural causes:

> If five aspects operate along with an infinite number, then the doctrine of the aspects is worthless. For Ptolemy even gave a cause for why men should have chosen those chiefly and omitted the others, but he did not prove that nature herself does not possess any more. The choice of man is not the measure of nature.[70]

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64 Ibid., 47–51.
65 Ibid., 45–47.
66 Ibid., 47–48.
67 *JKGW*, 1, 39.22–23.
68 Ibid., 43.24–26.
69 *JKGW*, 13, no. 123, 372–373.
70 Ibid., 363–367: "Si 5 aspectus operantur, infiniti operabuntur, Vana est igitur doctrina aspectuum. Nam Ptolemaeus causam quidem dedit, cur homines hos potissimum elegerint, caeteros omiserint, at non probavit, naturam ipsam plures non habere. At non est Naturae mensura hominis Electio."

Once again, Kepler argued that the essence of the aspects was to be found in nature rather than the literature that had so often led us astray. As for the practice of prediction, Kepler recommended that Herwart remain general. "I do not move beyond the prediction of physiognomy, temperament, and major medical crises," Kepler wrote, "and in this way I consider myself free from superstition."[71]

Why did Kepler think the number of aspects had remained unresolved for so long? While he recognized the existence of no more than eight harmonic divisions of a string,[72] it was not their correspondence with these divisions that determined the eight aspects as influential. More significantly, the aspects shared with the consonances the same metaphysical foundations, a core set of archetypal principles constituted by clearly defined constraints. Kepler claimed these principles had produced a set of regular polygons that could be inscribed in a circle with the help of a ruler and compass. In the case of quadrature, the separation of two planets by 90° on the circumference of a circle formed the side of a square whose vertices touched the interior of the circle at four equidistant points. With trigon, the angular displacement of 120° amounted to the side of an inscribed triangle whose three vertices split the circle into three equal parts. The numbers of angles and sides of these figures were not as important to Kepler as their ability to be constructed rationally. According to this central premise, polygons such as the heptagon were prevented from being accepted.

Kepler considered the inscription of regular polygons as a way of accessing archetypal principles. These principles were geometrical patterns made momentarily manifest by the disposition of the heavens. Kepler would later define the regular polygons as figures whose "sides and outward-facing angles" were equal and whose inscription in a circle was determined by "the proportion of the side of the figure to the diameter of the circle."[73] "To know in geometry," Kepler later wrote, "is to measure by a known measure, which for the purpose of inscribing figures in a circle is the diameter of the circle."[74] For Kepler, the knowability and constructability of these figures were two sides of the same coin. And since irrational figures could not be constructed rationally, Kepler could not accept their influence in the form of celestial configurations. The eight aspects

71 Ibid., 430–433.
72 Ibid., 374–375.
73 *JKGW*, 6, 20.17–21.25.
74 Ibid., 21.30–33.

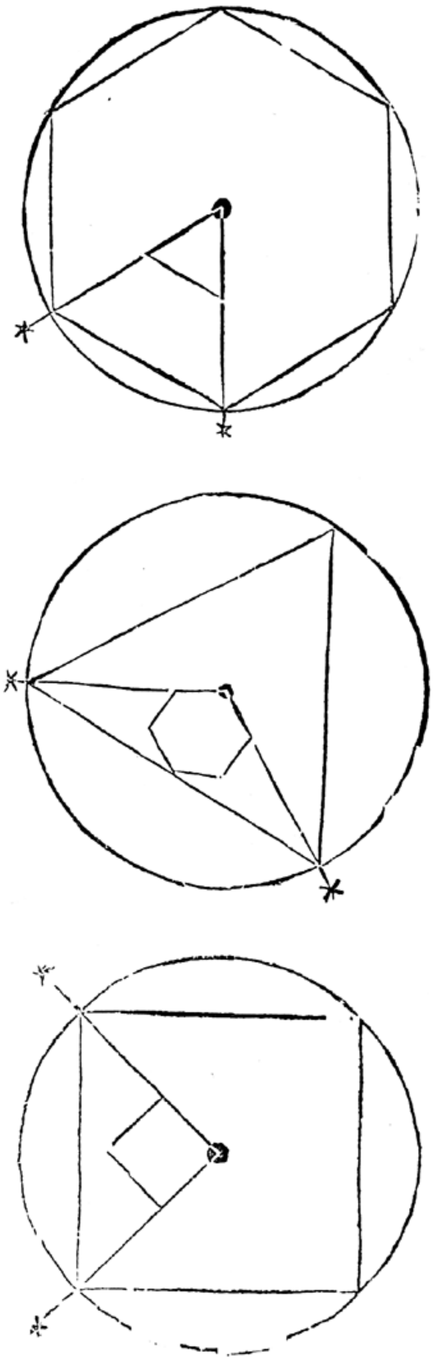

Figure 1. Agreement of quadrature (90°), trine (120°), and sextile (60°) with the sides of a square, triangle, and hexagon respectively. Johannes Kepler, *Harmonices mundi liber IV. De configurationibus harmonicis radiorum sideralium in Terra* (Linz, 1619), pp. 145–146. Courtesy of the Dibner Library of the History of Science and Technology, Smithsonian Library Institutions.

he did accept were based on the same archetypal principles that underlay the harmonic consonances. In his letter to Herwart, Kepler compared the geometrical grounds of the aspects to a dwelling place whose three new residents still required scrutiny before gaining admission to the inner abode of the original five. The infinite other configurations, meanwhile, were kept completely outside:

> Thus, either a cause must be produced for why the five aspects should operate and not the other three, or the other three must be admitted into the company of the five. Although this may happen, however, the door through which the other three are admitted lies in a dwelling place where the house remains closed even when the door to the site is open. And the crowd of countless aspects is kept outside, shut out by the front door.[75]

Among the countless mass of aspects "shut out by the front door," Kepler accepted only a few according to a select set of geometrical principles. That the doctrine of the aspects was "worthless" was thus proven wrong by the use of these principles. The limits of rationality, represented by our inability to realize certain figures, prevented the vast majority of configurations from ever being considered for candidacy. Kepler had followed a similar line of reasoning with his polyhedral hypothesis in the *Cosmographical Mystery*, where the number of regular polyhedra set a natural limit on the number of planets.

Kepler further explored the archetypal roots of the aspects in another letter to Herwart of August 1599. There, Kepler suggested an absolute analogy between astrology and music that Herwart could grasp if he considered their common cause more closely. Variously realized in the form of regular polygonal principles, geometry underlay astrology, music, and every other area of interest for Kepler. In the area of astrometeorology, Kepler attributed these principles to a sublunar soul, "an operative force [*vis*] of the stars" on earth that accounted for the influence of the heavens on the weather.[76] For Kepler, the study of astrology summoned the same set of principles that he found at the heart of his epistemology. Unified by these archetypes, Kepler's cosmos was based on a divine metaphysical

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[75] *JKGW*, 13, no. 123, 377–380: "Quare, aut causa confingenda est, cur 5 aspectus operentur, 3 non: aut 3 residui in consortium admittendi sunt. Id etsi fiat, tamen janua quâ admittuntur, intra aedes est: quâ patefactâ, domus nihilominus adhuc clausa est: populusque infinitorum aspectuum foris stat, januâ summotus exteriori."

[76] *JKGW*, 14, no. 130, 579–581.

blueprint.[77] That man was created in the image of the creator, he claimed, allowed us to understand this blueprint together with the formal causes of natural occurrences.

Despite Kepler's best efforts to convince Herwart of the aspects, Herwart remained doubtful. As he confessed in a letter of August 1599, he still could not see the aspects as anything more than the products of opinion and superstition. While Herwart could accept other features of the cosmos as the consequence of "some particular and special reason," he saw no hint of substance in the aspects in judicial astrology:

> I do not doubt that it happened for some particular and special reason that among all of the fixed stars only seven should be found moving. And yet I would still not see any firm foundation from which that force and effect commonly attributed to the aspects of the stars should be proven, such that also all of astrology (judicial, that is) seems to me to depend entirely on opinions and superstitions.[78]

In the face of something that seemed so slippery and uncertain, Herwart chose to reject the aspects along with the rest of astrology. He simply could not understand how such a dubious subject had attracted so many while far greater questions had gone without significant study. Why had the creator chosen to create the heavens in such a way, he asked, with "so many stars in the firmament of such and such a size, separate from one another" in such and such a way?[79] And why had God chosen to create "seven moving stars and not fewer," following their paths in such a way?[80] "I marvel that there has never been any place or people," Herwart wrote, "who either did not discuss these two particular questions among celestial matters or did not convey them more fully to posterity."[81] Without offering any further explanation, Herwart affirmed the complete rejection of astrology. Although he recognized that "some numbers of the consonances coincide remarkably well with the numbers of angles that

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[77] Rabin, 2010, p. 62: "This was Kepler's view of the natural world: ordered, comprehensible, reducible to a single principle, as the divine creator's world ought to be."

[78] *JKGW*, 14, no. 133, 60–65: "Nec dubito. Ex speciali, et praecipuâ quadam ratione id evenisse, ut inter tot fixas, non nisi septem errantes reperiantur. Tametsi uerò nondum adhuc ullum firmum fundamentum uiderim, ex quo vis illa, et effectus, qui aspectibus stellarum tribui solet, comprobari possit, uti quoque tota Astrologia (Juditiaria videlicet) ex meris opinionibus et suspitionibus mihi quidem dependere videtur."

[79] Ibid., 69–70.

[80] Ibid., 70–72.

[81] Ibid., 65–68.

subtend the sides of figures inscribed in a circle,"[82] he did not make any further commitment. And if Herwart did not accept the aspects, Kepler stood little chance of convincing him of anything at all.

From the Earth to Humanity: Further Effects of the Astrological Aspects

Kepler emphasized not only the effects of the aspects on the weather. In his letters to Herwart, he also stressed their significance for the constitution of human characteristics. Moving from astrometeorology to judicial and natal astrology, Kepler argued that the configuration of the heavens at the time of birth left a lasting influence, suggesting a celestial stamp that led to particularities in an individual's personality. According to this original imprint, everyone acquired a certain set of behavioral tendencies. In addition to serving as a source of temperament, this configuration became a sort of scale that could measure the impact of future configurations. Comparing the nativity to gardening devices used for shaping gourds, Kepler stressed the ability of the aspects to shape—rather than determine—the daily activities of individuals:

> How does the configuration of the heavens at the moment of birth become the character of a man? For it operates in him as long as he lives, not unlike those restraints bound round gourds by the skillfulness of farmers. Although they do not give life to the gourd, they do shape it. In the same way, although the heavens may not give a man his morals or actions or fortune or children or wealth or a wife, they do shape everything befalling him.[83]

Although the heavens would pass into a series of "infinite forms" over the course of life,[84] Kepler focused on their original impression. The study of a nativity was a question of "something that is not there,"[85] an exploration of the enduring influence of the heavens on one's soul. The body was "far too coarse to take up this character," Kepler claimed, while the soul was well suited for serving as the subject of it.[86]

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[82] Ibid., 57–59.

[83] *JKGW*, 13, no. 117, 224–230: "Qua ratione facies caeli in puncto nativitatis, fit character hominis. Operatur enim in hominem quamdiu is vivit, non secus ac compedes illae injectae cucurbitis, agricolarum ingenio: quae cum cucurbitam non vegetent, tamen formant. Sic caelum etsi nec mores nec facta nec fortunam nec natos nec divitas nec uxorem homini det, omnia tamen homini obvenientia format."

[84] Ibid., 230–231.

[85] Ibid., 231–232.

[86] Ibid., 309–313.

Kepler saw this original imprint as a personal reference point that conditioned the actions and events in every individual's life. The key part of this personal watermark was the aspects. Kepler found a familiar example of their influence in the life of Barbara, his wife, whom he had married in April 1597. Jupiter and Venus had been poorly positioned at Barbara's birth, and their lasting influence had left her plump and plain-minded:

> You may observe an individual in whose nativity those noble ones, Jupiter and Venus, are unfavorably positioned . . . You may see that such an individual, however honest and sensible, enjoys a rather unfortunate and sorrowful fate. I know such a woman well. She is praised by the entire city for her virtue, humility, and modesty, while she is equally simple-minded and corpulent in frame.[87]

Commended by the community for her moral qualities, Barbara bore flaws that her husband associated with the unfavorable influence of the heavens. Kepler went on to assign a similar influence to the series of sad marriages that Barbara had suffered. Born to a prosperous family, Barbara had already endured two miserable marriages before meeting the "poor and contemptible" Kepler. As he confessed to Herwart, Kepler only worsened her condition by earning a small salary and achieving little success in securing a share of her inheritance:

> From an early age, she was treated harshly by her parents and, scarcely an adolescent, married a forty-year-old man beyond the pale of pleasure. When he died, she immediately married another man of the same age with a more active spirit, though he was not much of a man and spent the full four years of their marriage suffering from illness. The third man she married is poor and contemptible, she [having been] wealthy before.[88]

Kepler moved on from marriage to the many other adversities encountered by Barbara. Plagued by the original configuration of Jupiter and Venus, she gave birth "with difficulty" and struggled even with simple activities.[89] Tying these other details together with her simple-mindedness and series of meager marriages, Kepler claimed that Barbara bore "the same

[87] Ibid., 236–241: "Videas hominem, in cuius genesi non commodè siti sunt boni illi, Jupiter et Venus . . . talem igitur hominem videas, quamvis probum et sapientem, invenustiori tamen et subtristi ut plurimùm fortunâ uti. Talis mihi nota faemina est. Laudatur tota urbe ob virtutem pudorem modestiam. Simplex tamen juxtâ est, et crasso corpore."

[88] Ibid., 242–247: "Haec ab ineunte aetate duriter habita a parentibus, vix adolescens nupsit quadragenario praeter lubitum, eo statim mortuo nupsit alii eiusdem aetatis alacriori animo, sed qui neque vir fuit, et totum quadriennium, quod in hoc vixit matrimonio, per morbos exegit, tertio nupsit pauperi et contempto, dives ipsa antea."

[89] Ibid., 248–249.

character of body, soul, and fortune, clearly an analogy with the configuration of the heavens."[90]

Kepler accounted for his own character according to a similar analogy. At his birth, Saturn and the sun were separated by 60° in the angular subtension of sextile. From his fervent interest in philosophy to his feeble frame, Kepler linked everything to this configuration, down to his very diet. It was at the heart of his sardonic sense of humor and his penchant for "bitter and pungent things," suggesting a strong saturnine element in his life:

> My customs are similar [in character to my body and soul]. I gnaw on bones and cram down dry bread. I enjoy bitter and sour things and walking through hills, ruts, and thickets. I neither possess nor desire any charms in life aside from my studies, and I refuse gifts.[91]

Kepler considered all of the above customs in concert with the location of Saturn at his birth. He even speculated that his disposition, "drawn against society," drove him to challenge the human race by arguing in favor of the motion of the earth.[92] Setting in motion "a globe of such great weight, gliding swiftly through the stars,"[93] was certainly a sign of audacity, and the original imprint of the heavens might have pushed him farther down the path of rebellion. In this way, Kepler identified with other luminaries such as Cicero, whose resistance had also provoked the general populace.

By offering these personal examples, Kepler attempted to provide proof of how an original configuration could forever affect the actions and circumstances of an individual. Considering the coincidence of certain events with the appearance of the aspects at birth, Kepler argued it was "impossible that the soul be the forger of fortune entirely."[94] Rather, the heavens would also leave their mark on one's life events by painting them in a particular hue. In this way, an original configuration would color every decision and event in the course of life, setting the body, soul, and fortune to the tune of the stars. If the body was "the image of the world," Kepler wrote, then the origin of every individual found a counterpart in their

[90] Ibid., 249–250.
[91] Ibid., 257–260: "Mores consimiles. Ossa rodere, siccum panem ingerere, amara, acerba gustare mihi deliciae, per salebras per clivos per dumeta ambulare festivitas. Delinimenta vitae, praeter literas, nulla nec habeo nec desidero, et oblata respuo."
[92] Ibid., 264–268.
[93] Ibid., 266–268.
[94] Ibid., 250–252.

ascendant and a demise in their descendant.[95] "This shapes the actions of an individual," Kepler explained, "as well as those things that occur while the individual is inactive."[96] From the body to the soul and even to external circumstances, the principal elements of the human condition were in part the product of the heavens.

Kepler also told Herwart how the original impression of the heavens conditioned an individual's response to subsequent configurations. Every arrangement after birth, he claimed, could be better understood by comparing it with this original mark. Assuming that "a natal configuration" would endure in every soul, Kepler related it to "the real stars revolving in the heavens" as a way of making sense of their role in one's life.[97] Accounting for the past, present, and future, this comparison revealed the basic contours of every biography from beginning to end. Returning to his own life as an example, Kepler noted the happy coincidence of one particular configuration at a point of medical crisis, "a nearly fatal fever" that had healed with the help of the heavens at the age of sixteen. As Kepler explained to Herwart, this configuration had been foretold by the form of the heavens sixty-four minutes after his birth:

> One hour after the moment of birth, the appearance of the heavens has aged by fifteen years, with 15° elapsing in an hour. An hour later, their appearance has aged by thirty years. In this way, the first six hours may extend to ninety years of one's life. At intermediate points, similarities are found among one's actions and other life events and those things rising and setting in the sky. In my own case, when a nearly fatal fever had befallen me at the age of sixteen, nothing more convenient could have happened than what was signified by Mercury in opposition and Mars in quadrature in 8° Cancer, that is, an hour and 4′ after my ascendant in rising above the horizon.[98]

Here, Kepler described how the heavens had appeared similarly sixteen years after what they had shown just over an hour after his birth. He marveled at the relation of the original imprint of the heavens and their

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95 Ibid., 296.

96 Ibid., 299–301.

97 Ibid., 389–392.

98 Ibid., 347–355: "Hora una post momentum partus, lapsa est in caelo imago 15 annorum, sicut in caelo 15 gradus caelestes horâ una moventur, horis 2, imago 30 annorum, adeo ut horae sex primae ad 90 hominis annos se porrigant. Quaeque intermediis horarum momentis in caelo oriuntur vel occidunt, eorum similitudines in actionibus aliisque temporaneis reperiuntur. Mihi anno 16 cum febris penè lethalis obvenisset, convenientius fieri nihil potuit, quàm ut ea significaretur ab ☍ ☿, □ ♂ in 8 ♋, hora una et sc: 4′ post meum ortum exoriente supra horizontem."

influence after birth, wondering how their original appearance could endure with "the changing sky."[99]

Still, Kepler could think of more spectacular things among the stars than the enduring influence of their original appearance. Managing to endure even more years, their motion was all the more remarkable:

> We marveled earlier that the configuration and form of the heavens may endure anywhere in the changing sky. Now, let us marvel all the more that the motion of the heavens is able to endure anywhere, allowing it to operate after so many years. For we understand their configuration and form to be imprinted in the same way as a seal is imprinted on wax, although that is an actual thing.[100]

Applying a classic metaphor, Kepler compared the impression of the heavens to the mark of a signature ring on sealing wax. This metaphor did not quite capture reality, however, since the soul was thought more subtle than any material phenomenon. Kepler searched for another example in vain. The image of something could "stay in the eye" long after the object had disappeared, but Kepler believed these images were "an actual thing."[101] Turning from sight to sound, Kepler noted that noise was "the image, as it were, of struck bodies," and the motion of the heavens did not produce any. "We have never seen nor heard an example," Kepler finally admitted, even though the matter had still not been "examined enough."[102]

Despite his best efforts to convince Herwart of the influence of the heavens on human lives, Kepler was unsuccessful. The kernel of truth that Kepler attempted to retrieve relied on the acceptance of certain principles that lay at the core of his cosmology. Herwart failed to grasp the rational limits determined by the construction of these principles. As Kepler later explained in the *Harmony of the World*, they set a natural limit that disqualified any figure whose side, in proportion to the diameter of a circumscribing circle, could not be determined "geometrically" from the number of angles of that figure.[103] By not accepting the geometrical rules that Kepler laid down as limiting principles, Herwart allowed for an infinite number of archetypal possibilities. As a result, he saw no reason

[99] Ibid., 369–370.
[100] Ibid., 369–372: ". . . mirabamur antea situm et faciem caeli permanere alicubi caelo abeunte. Iam multo magis est, ut miremur motum caeli alicubi manere posse, ut post tot annos operetur. Situm enim et faciem alicubi imprimi intelligimus, ut in cera sigillum imprimitur quae res est."
[101] Ibid., 375–376.
[102] Ibid., 374–380.
[103] *JKGW*, 6, 22.28–31.

to limit the number of aspects to eight or any other number, for that matter. Herwart was equally apprehensive about the influence of the aspects, which he viewed with as much uncertainty as every other part of astrology. Failing to appreciate the role of the archetypes in Kepler's cosmology, Herwart could not understand why the aspects would remain the one essential element of Kepler's astrology. Rather than dwell on the aspects, however, Herwart preferred to move on to more pressing matters relating to the motives of the creator.

In his response to Herwart, Kepler argued that any question about the cosmos inevitably involved the same set of underlying principles. This held true whether Herwart wished to examine the number and displacement of the stars or how the heavens acted on earth. (On the first question, Kepler claimed to have given a perfect explanation for the number of planets in the *Cosmographical Mystery*, where he had removed "any doubt" there were six in motion around the sun.)[104] In a letter of December 1599, Kepler illustrated the comprehensive nature of his cosmology in an outline of a "cosmographical dissertation" that he would later publish as the *Harmony of the World*.[105] As described above, Kepler foresaw five "books or chapters" corresponding to the areas of geometry, arithmetic, music, astrology, and astronomy, respectively.[106] With subject matter as diverse as "the causes of the harmonies," "the causes of the aspects," and "the causes of the periodic motions [of the planets]," those books would be brought together by the same geometrical principles.[107] Through their unity, Kepler proposed a form of disciplinary harmony that differed sharply from growing political and religious divisions in his province. Strongly disturbed by the rising tide of the Counter Reformation in Styria, Kepler barely managed to complete an outline of this work before abandoning Graz. Drawn to Prague by the promise of a position at the new observatory there, Kepler left Graz in 1600.

The Weight of Proof: Observational Evidence for the Astrological Aspects

Kepler did not rely exclusively on archetypal principles for his account of the aspects. To determine their influence on the weather, he assembled

[104] *JKGW*, 14, no. 134, 510–512.
[105] *JKGW*, 14, no. 148, 13.
[106] Ibid.
[107] Ibid., 15–19.

a collection of observations from his early career. In turn, these observations allowed him to measure the accuracy of his annual prognostics.[108] In a letter of 1595, for example, Kepler confirmed his forecast of an unusually harsh winter for that year. As evidence of "an extraordinary cold," he recounted the experience of local herdsmen who had recently returned home only to find their noses frozen and falling to pieces.[109] "So far, my calendar is correct," Kepler wrote, "for many herdsmen in the Alps perish from the cold when they return home and wipe their noses."[110] Nor was there any doubting the influence of the heavens in the spring of 1599, when an unusual drought and blazing sun had burned through the month of April. "Is it really chance," Kepler asked, "that there was a long-lasting quadrature of Saturn and Jupiter?"[111] Emboldened by this evidence, Kepler often emphasized the importance of "astrological experience" as a sure way of distinguishing "arbitrary causes" from the demonstrable influence of the aspects.[112] He even asked Herwart to accept the testimony of the weather as a primary way of fostering faith in their influence. In the light of observation, "the doctrine of the aspects" was simply "not to be rejected."[113]

Kepler thus combined the supposition of certain archetypal principles with the support of observational evidence. He claimed a configuration that did not possess the right geometrical properties could not be confirmed by experience. And once the right principles were in place, he invited others to probe their potency empirically. Kepler argued that the principles he had found called for the addition of three new aspects whose influence was worth scrutiny. In effect, Kepler had put forward a binding principle, a new and unique basis for why the eight aspects were "the only ones."[114] While he praised Ptolemy for filtering many "frivolities" and focusing more on nature, Kepler scorned the Alexandrian astronomer for arguing that the original five aspects were "the only ones taken into consideration by us."[115] Claiming reason rather than custom, Kepler rejected the many practices he thought had "led astray astrologers and

[108] For an introduction to Kepler's annual prognostics in his early career, see Boner, 2008a.
[109] *JKGW*, 13, no. 16, 16–20.
[110] Ibid., 16–19.
[111] *JKGW*, 14, no. 134, 498.
[112] *JKGW*, 4, 138.7–141.39.
[113] *JKGW*, 14, no. 134, 491.
[114] *JKGW*, 13, no. 117, 422–425.
[115] Ibid., 412–424.

natural philosophers" from the firm footing of the aspects.[116] His was a complete return to nature, a path that revealed three new configurations and a revolutionary connection with the world of music. In later correspondence, Kepler would continue to rely on his observations in defense of these discoveries.[117] Let us now turn to a later example of Kepler's use of "astrological experience" together with the archetypal principles.

In March 1608, Kepler's account of the aspects would come under attack from the physician and friend Johann Georg Brengger. Intrigued by Kepler's mention of "meteorological experience," Brengger asked Kepler for specific examples in support of the three new aspects. Given the number and variety of configurations that came at such a brisk pace, Brengger could not associate certain weather conditions with the appearance of the heavens at any particular point. The result, Brengger claimed, was a confusing flood of configurations that called into question the very possibility of proving the aspects:

> You write that you have proven the extraordinary aspects [quintile, biquintile, and sesquiquadrature] from meteorological experience. I should like to see an example of this experience, for with so many different aspects occurring so often that you may not be certain which one you attribute a change in the weather, I do not know how to make use of experience or if it is even possible.[118]

Brengger did not believe he could derive any evidence for the aspects from observing the weather. In the end, he challenged not only the application of experience but the very ability to distinguish a discrete number of influential configurations.[119]

In his reply to Brengger, Kepler turned to the relation of the aspects and the musical consonances. Building on his earlier battle with Herwart, Kepler explored the nature and number of the aspects according to the

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116 Ibid., 419–422.

117 On the importance of observational evidence in Kepler's various accounts of the aspects, see Field, 1988, pp. 61–63, 128–130.

118 *JKGW*, 16, no. 480, 6–10: "Scribis te aspectus extraordinarios et ab experientia meteorologica comprobatos habere, optarim ego huius experientiae specimen videre, nam in tanto aspectuum numero et varietate, qui semper occurrunt, ubi incertus sis cui eorum mutationem aliquam aëris adscribas, nescio quomodo experimentum capere debeam, vel etiam possim."

119 Brengger became a regular contact of Kepler in December 1604, when Brengger suggested that they accept "philosophy as a means of establishing a friendship." Impressed by Brengger's articulate and careful criticism in correspondence, Kepler asked him in October 1607 to read the manuscript of his forthcoming *New Astronomy*. See *JKGW*, 15, no. 310, 2–6, and *JKGW*, 16, no. 448, 1–7; cf. Caspar, 1993, pp. 171–172, 266.

same basic principles at the heart of his theory of harmony. “You see that the consonances in music and the aspects in astrology,” Kepler wrote, “spring from the same geometrical source of the division of the circle.”[120] And even though the consonances were found on a chord and in this way “more removed” from their circular source,[121] they shared the same characteristics that kept the aspects from extending to infinity. Kepler gave his weather observations priority of place, however, beginning his letter to Brengger with an example of the influence of quintile (72°), one of the new aspects. Naming just a single example, Kepler noted there were many more. He also made it clear that his example had been calculated according to the ephemerides of Giovanni Antonio Magini (1555–1617) and confirmed with the observational instruments of Tycho:

> I may give very many examples of experience of the secondary aspects, but there is not enough space for describing my observations. For in the year 1600 when none of the primary aspects appeared from 23 April to 2 May (N.S.) and quintile was displayed by Saturn and Jupiter according to Magini, an abundance of snow fell in Prague on 1 May and in Styria during the wedding ceremony of [Archduke] Ferdinand . . . Through direct study of the heavens, it was found that on those same days there were 72° between Saturn and Jupiter. For Tycho’s students provided proof of this for me with a Tychonic quadrant.[122]

Kepler suggested an even greater significance for observational evidence in considering a new configuration. Semisextile, the circumferential separation of 30°, seemed opposed to “all reason,” yet Kepler was willing to accept it on “experience alone.”[123] Here, the observations indicated a source of influence in the absence of reason. Along with the prospect of another aspect, Kepler faced the risk of reconceptualizing the relation of astrology and music. To complicate matters further, the same criterion of experience would call into question sesquiquadrature, one of the other new aspects already accepted on archetypal grounds:

[120] *JKGW*, 16, no. 488, 42–44.
[121] Ibid., 44–46.
[122] Ibid., 8–15: “Specimina experientiae de aspectibus secundariis, plurima dare possem, sed non vacat describere observationes meas. Anno quidem 1600. cum à 23 Apr. in 2 Maii St: No: nullus esset ex primariis aspectibus, ⚓ uerò ♄ ♃ in Magino exhiberetur, 1 Maii copiosissima nix cecidit et Pragae et in Styria in nuptiis Ferdinandi . . . Consulto coelo, inventum est iisdem diebus inter ♄ ♃ esse 72° gr: Nam studiosi Tychonis in meam gratiam periculum fecerunt quadrante Tychonico.” Archduke Ferdinand married Maria Anna of Bavaria, daughter of Duke Wilhelm V, on 23 April 1600.
[123] Ibid., 93–95.

> I confess that reason supplied me with those three, quintile, biquintile, and sesquiquadrature, while experience alone supplied semisextile against all reason . . . Experience confirms quintile, biquintile, and semisextile, while it confirms sesquiquadrature more obscurely and doubtfully.[124]

It is testimony to the importance of observational evidence that Kepler was moved "against all reason" to consider semisextile as an influential configuration. Whether he could ultimately limit the number of aspects to eight, he could not deny their tangible effects on earth.

As for Brengger's reluctance to match the weather to the aspects, Kepler argued that it was not particular changes so much as "a general commotion of nature" that the stars could stimulate.[125] Predictions based on the arrangement of the heavens at a particular point could only be made in a general manner due to regional differences and other details that relied on a local knowledge of nature. These factors did not reduce the value of astrology, Kepler claimed, but reinforced it as the study of the regional resonances of the heavens. Returning to his example of heavy snow in the spring of 1600, Kepler explained that the same configuration could have produced another condition. The sign of influence, he suggested, was the sudden uproar of snow rather than the particular state of weather that he could not have easily foreseen:

> Yet I attribute nothing of note to the aspects except for a general commotion of nature that generates the weather. For what in this example was snow can in another be rain and similar things: it can also be a dry wind, it can be a wet vapor, which, with the faint appearance of a cloud in the bright light of the sun during the day, is the forerunner of fissures.[126]

Whether in rain, wind, or snow, Kepler identified the influence of the heavens in the weather. Setting aside any specific association, he focused on a fundamental resonance in the form of meteorological phenomena. This was a symphony orchestrated by the aspects, which produced a palpable, if often unpredictable, effect on earth. In the following chapter, we explore this symphony further as it unfolds in Kepler's response to a brilliant new luminary in the heavens.

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[124] Ibid., 93–125: ". . . fateor, tres hos ⚓ ✯ ♯ ratio mihi suppeditavit . . . sed semisextum nudissima experientia contra omnem rationem . . . Experientia confirmat ⚓ ✯ ✳ sed ♯ confirmat obscurius et dubie."

[125] Ibid., 15–17.

[126] Ibid., 15–20: "Sed nota nihil aspectibus tribuo, nisi in genere commotionem Naturae quae gignit meteora. Quod enim in exemplo nix fuit, in alio potest esse pluvia et similia: potest et ventus esse siccus, potest humida esse exhalatio, qualis de die resplendet instar nebulae, humilis et luce Solis clara, praenuncia chasmatum."