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Scripture in the Sky: Jeremias Drexel, Julius Schiller, and the Christianizing of the Constellations

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Abstract. From the times of early Christians up to the Enlightenment, the twelve ancient signs of the zodiac were challenged as highly inappropriate pagan images. The most concerted efforts to replace those signs with names, mottos, and images taken from Holy Scripture occurred in the early decades of the 17th century. We review the background that led to the proposed use of sacred mottos by Jeremias Drexel, and then of the names and images of the Twelve Apostles by Julius Schiller. The reaction of a leading seventeenth-century astronomer is presented to suggest why such changes were never adopted. Finally, we address issues of conflict and motivation that might have led to efforts to Christianize the Heavens.

1. Introduction

The constellations of astronomy sit at a unique intersection of science, folklore, art, and religion. Their popularity spans the millennia of recorded history, and we can safely assume that the practice of seeing and naming patterns in the stars precedes even the earliest depictions found in cave art. And yet, for astronomers of the past several centuries, constellations have no relevance whatsoever to their research into the workings of the natural world.

Today the most popular form of constellation lore–that attached to the twelve constellations of the zodiac by astrology–bears no relation to science. However, the constellations, both images and names, were once a pressing concern to astronomers. Religious, political, and scientific controversies once found their common theater of conflict in the constellations and the celestial atlases that represented them. These battles, often fought with no more than prefaces, footnotes, and illustrations, are the subjects of our study.

When the ancients grouped the fixed stars into constellations, they also noticed that a few objects in the night sky wandered among them: the Sun, Mercury, Venus, Mars, Jupiter, Saturn and our Moon. These seven objects (which give us names for the seven days of the week) were not distributed randomly about the celestial sphere, but rather had their motions (assumed to be geocentric) confined to a distinct zone or belt that encompassed twelve specific constellations. Thus the zodiac and its twelve signs comprised the highway and sign posts of the sky. This grand scheme of about 1000 fixed stars, organized into 48 constellations, with 12 of them the arena of all celestial action, became the classic geocentric Ptolemaic cosmology described in the

Almagest in 140 AD. The twelve zodiacal constellations remain with us today: Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpius, Sagittarius, Capricorn, Aquarius and Pisces. Their staying power over the centuries is all the more remarkable when we consider the long, if fitful, campaign against them.

2. The Use of Constellations

When astronomers of the 21st century point a telescope at a specific region of the sky, they follow the same practice used by astronomers for centuries: a system that indicates celestial latitude and longitude in terms of "declination" and "right ascension". While it might still be convenient, for example, to say that a comet is in Gemini, or a star-forming region is below Orion's belt, those names for general regions of the sky have no relation to the actual practice of astronomical research. They are good names, with wonderful stories, and they provide a cherished link to the past. Yet, their passage from ancient times to the present was neither smooth nor unchallenged. The gods and goddesses of early religions found their way to immortality in the sky only to become a concern to later religions. While much of the poetry, philosophy, science and architecture of Greek and Roman antiquity passed into western European culture with esteem, the religions that gave birth and substance to them were dismissed as mere pagan mythologies. The signs of the zodiac have weathered several attacks on just these grounds.

3. Re-naming Constellations

Early in the history of Christianity, there were calls to replace the pagan figures that populated the sky with Christian symbols, thought to be more appropriate to celestial matters. Early church leaders endorsed new names for the constellations in the hope that their former pagan names would simply disappear. Typical of this approach were the suggestions put forward by St. Augustine (354-430) and the Venerable Bede (672-735). Within this context of semantic switchery, the twelve zodiac constellations received special attention because of their prominent role in astrological prediction. St. Augustine, with good precedent in both Christian and classical thought, denounced astrological forecasting of human fate and proposed instead a select clergy who would provide the correct scriptural guidance needed for salvation. That Augustine was well-aware of astronomical matters is evident in artistic representations: for example, in Botticelli's magnificent fresco in the Church of the Ognissanti in Florence, the upturned gaze of the saint leads the viewer's eye to an armillary sphere displayed prominently above his desk.

For nearly a thousand years after Augustine and Bede, such concerns continued with less visibility until developments in the 16th and 17th centuries. In 1517 Luther initiated the Reformation, which quickly led to waves of challenges to accepted authority. One such example was iconoclasm, the destruction of images deemed to be offensive to heavenly concerns (Koerner 2004). Luther in Germany and Calvin in Switzerland had remained firmly opposed to the heliocentric system promoted by Copernicus in his *De revolutionibus* in 1543 (Drake 2001). In their minds, the reformation of religion was not to be linked to any proposed "scientific corrections" to the Aristotelian universe. Yet, in Italy, just a decade prior to Galileo's publication of *Sidereus Nuncius* (1610), when

the physical reality of the natural world was to collide head-on with church-endorsed scientific pronouncements, Giordano Bruno (1548-1600) had no such hesitation. He argued for the twelve signs of the zodiac to be replaced summarily by the twelve Moral Virtues, also called the Twelve Fruits of the Holy Spirit (Charity, Joy, Peace, Patience, Kindness, Goodness, Generosity, Gentleness, Faithfulness, Modesty, Self-control, and Chastity).

While Bruno's proposed reform of the heavens died with him at the stake, Jeremias Drexel (1581-1638) pushed Bruno's concepts even further by circulating manuscripts devoted entirely to replacing the pagan signs of the zodiac with symbols intended for Christian meditation. Drexel's treatise on the topic was published in Munich in 1622. Then, Julius Schiller unveiled by far the most extensive attempt to Christianize the heavens by offering both new images and names for the constellations in his *Coelum Stellatum Christianum* ("The Starry Christian Heavens"), an atlas published in the year of his death (1627). His compilation also included many new stars discovered using telescopes, and thus his goal was to get astronomers to use both the old and new stellar positions in his maps for their professional work. Schiller's complete plan was bold and thorough–replacing the 48 constellations of Ptolemy with 48 figures from the Bible. With constellations in the northern hemisphere represented by New Testament names and images, and those of the southern hemisphere by the Old Testament, Schiller then offered no less than the Apostles of Christ for the twelve constellations of the zodiac.

The appearance of Schiller's atlas in 1627 and the translation of Drexel's book into English in 1633 (the year of Galileo's trial) were the high-water marks of efforts to merge religion and astronomy. Revisionist projects, however, were not at an end. Later in the same century, Erhard Weigel (1625-1699) shifted the focus from religion to politics when he proposed that the symbols of the zodiac be replaced by the coats of arms of the European dynastic families. In this study, we will concentrate on the works of Drexel and, in particular, Schiller, the two most prominent advocates of their time for replacing the pagan "idols" of antiquity with Christian paragons from scripture.

4. Star Atlases, Symbols, and Sacred Assignments

Historians of astronomy widely credit the humanist and popularizer of science Alessandro Piccolomini (1508-1578) with the first printed star atlas (Warner 1979). Its woodblock prints depict the classic constellations using variously sized symbols of stars to portray levels of stellar brightness. His *De le stelle fisse* was first published in 1540, with many subsequent editions up to 1595 (Gingerich 1981; Kanas 2006). Piccolomini produced a "pure" star atlas in the sense that no images of the constellation figures were shown; he offered page-by-page groupings of stellar positions to aid observers (professional or amateur) in the visual identification of the constellations. In 1603, Johannes Bayer (1572-1625), a lawyer living in Augsburg who had a keen interest in astronomy, unveiled a major star atlas, the *Uranometria*, published in Augsburg again in 1624 and reissued several times in Ulm from 1639 well into the 18th century. It contained the positions of nearly 2000 stars, many ordered by brightness level. Bayer represented the 48 ancient constellations, each with a copperplate engraving of the classical figure and stars associated with it; in addition, he added a plate with 12 new constellations of the southern sky comprised of stars discovered by Dutch explorers (Kanas 2007). Astronomers found Bayer's atlas suitable to their needs and it became a fundamental tool for the field.

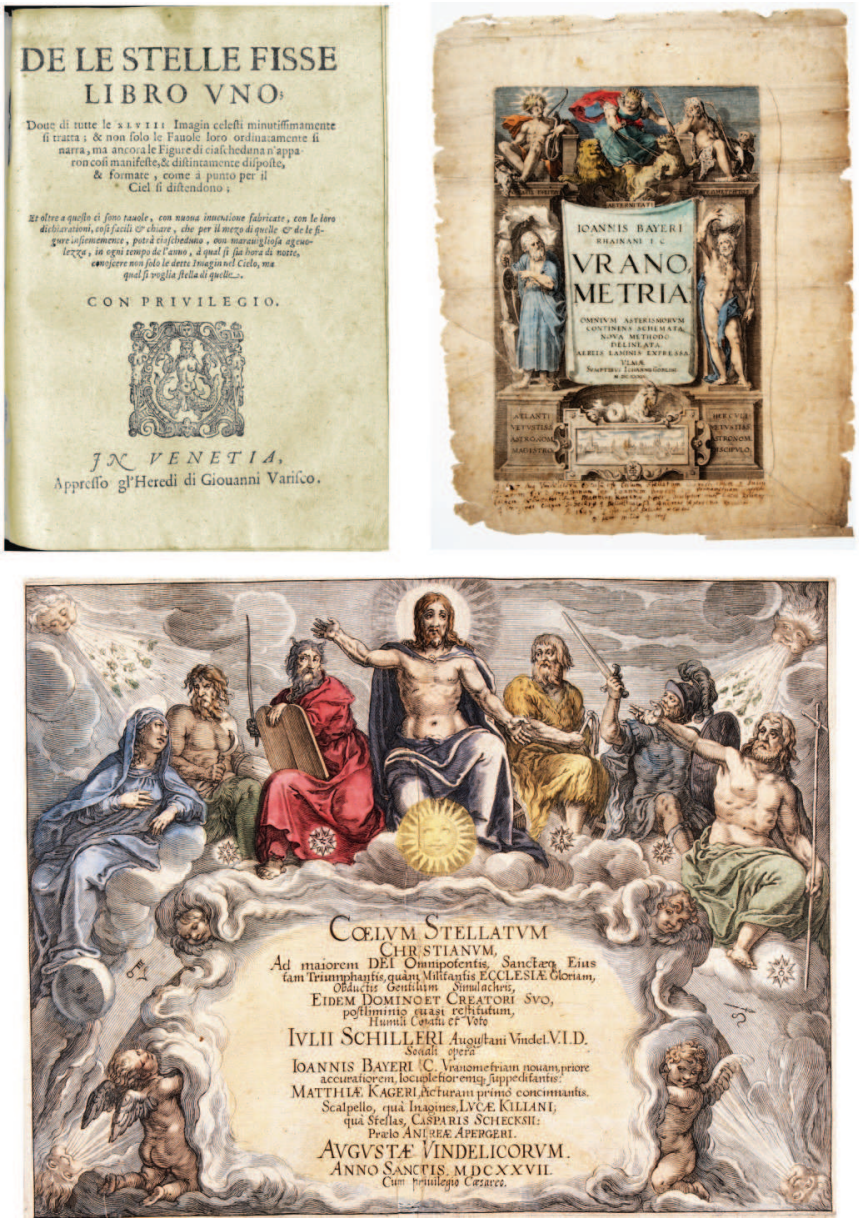


Figure 1. Title pages of the celestial atlases of Piccolomini (upper left panel), Bayer (upper right panel), and Schiller (bottom panel). (Credit: Mendillo Collection)

Julius Schiller (c. 1580-1627) was another Augsburg lawyer with a strong interest in astronomy, and thus a colleague of Bayer's in several ways. He produced a star atlas entitled *Coelum Stellatum Christianum* (1627), begun with advice and assistance

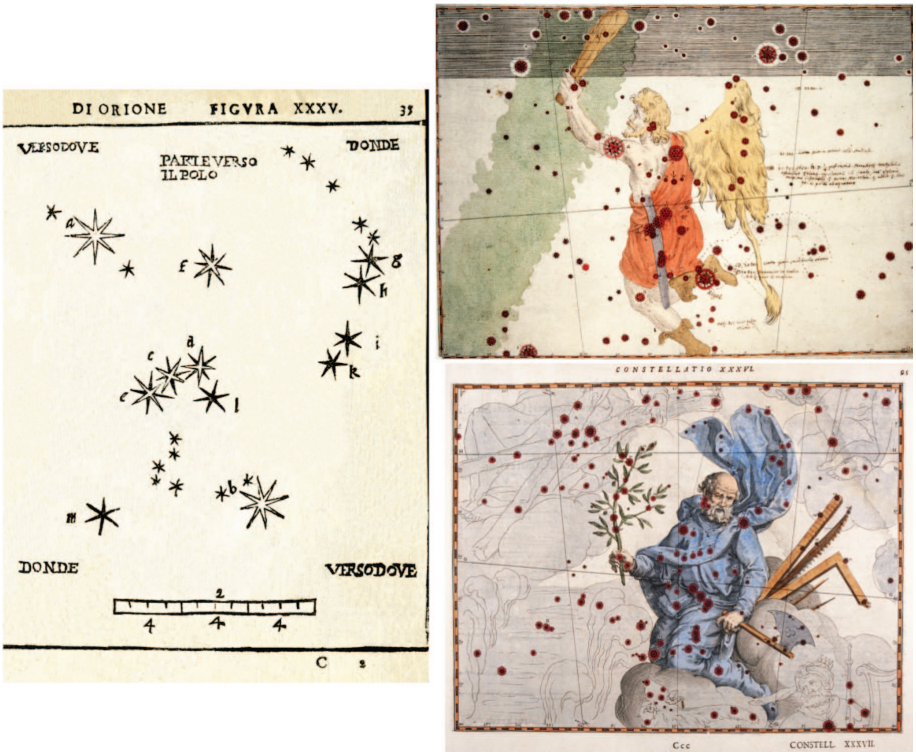


Figure 2. The constellation Orion (St. Joseph) as depicted by Piccolomini (left panel), Bayer (upper right panel), and Schiller (lower right panel). (Credit: Mendillo Collection)

from Bayer and others. It contained updated stellar information, but, as we have noted, its major departure from past conventions was the set of copper-engraved prints of constellations depicting Biblical figures.

Figure 1 gives the title pages of the Piccolomini, Bayer, and Schiller star atlases. Figure 2 shows how the constellation Orion was portrayed in those three atlases. In Piccolomini, the famous three belt stars of Orion are aligned from lower left to upper right (as they actually appear in the sky). The stars of Bayer's atlas are also presented from this perspective. Schiller, adopting a format used in celestial globes, portrayed those stars as they would be seen from outside of the celestial sphere (a God's-eye view). Schiller's revolutionary step was to envision in that same set of stars St. Joseph, protector of the Holy Family, and not that reprehensible pagan character Orion.

Jeremias Drexel (1581-1638), born in Augsburg, joined the Jesuit order and rose to prominence in the court of Maximillian I of the Holy Roman Empire. He was a powerful orator and a prolific author during a time of upheaval and conflict that included the Thirty Years' War. As with Piccolomini, Bayer, and Schiller, Drexel was not an astronomer but had developed a serious amateur interest in the field, perhaps due to his long acquaintance with Schiller and the presence of Bayer in Augsburg. Drexel had suggested a fresh set of mottos and symbols to replace the traditional signs of the zodiac

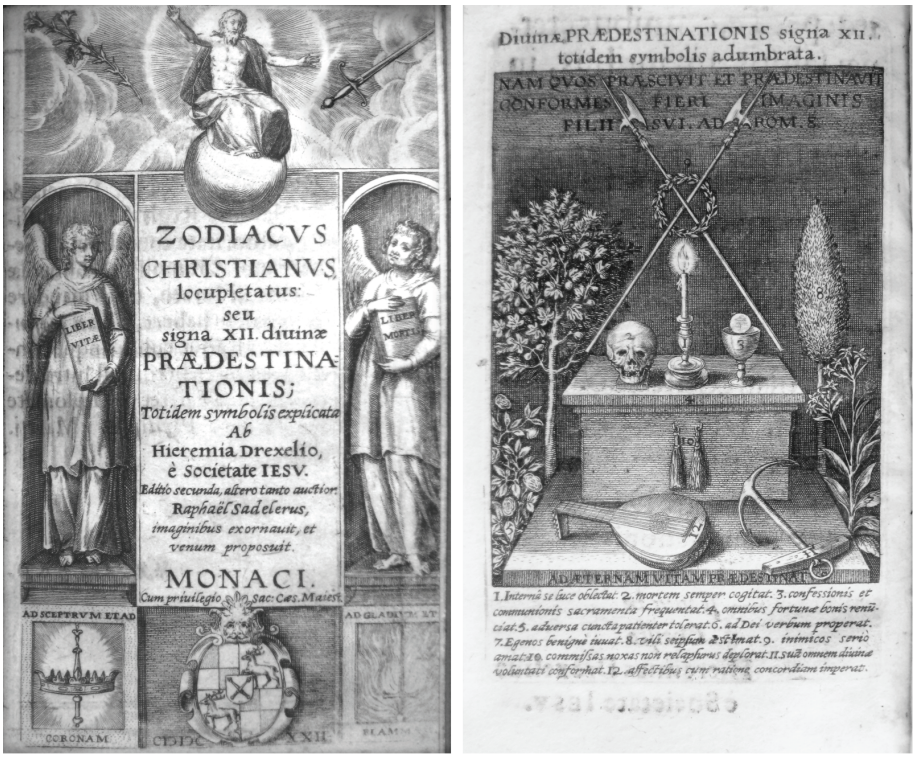
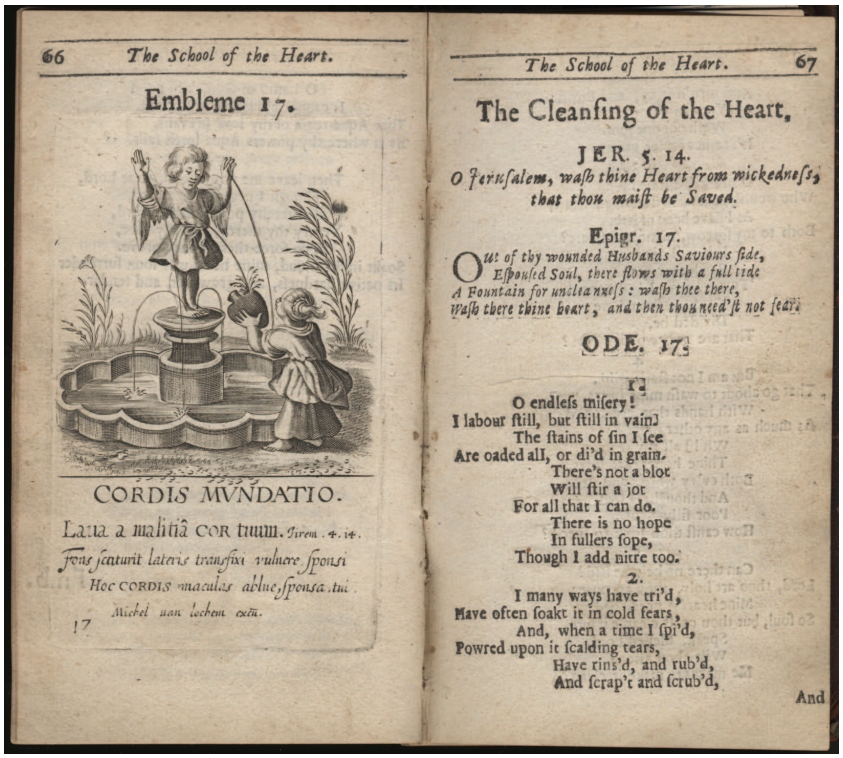


Figure 3. Left panel: Frontispiece of Drexel's book of 1622. Right panel: Drexel's figure summarizing the twelve symbols proposed as replacements for the signs of the zodiac (see list in Table 1). (Credit: Andover-Harvard Theological Library)

in his *Zodiacus Christianus*, published in Germany in 1622 (Figure 3), and translated into English in 1633. Schiller quoted Drexel extensively when discussing his re-naming scheme for the constellations. Table 1 presents a summary of the relationship between the Drexel, Schiller, and Bayer systems of zodiac identification. Included in the table are the symbols used for the traditional zodiacal constellations and those related to the twelve Apostles.

5. Schiller, Drexel, and the Emblem Tradition

Schiller not only turned to Drexel as a recent precedent for Christianizing the zodiac but also borrowed from him a central technique: the pairing of each zodiacal "image" with a motto and a corresponding scriptural passage. For readers of both Drexel and Schiller, this pairing of text and image would have inevitably recalled the wildly popular genre of the emblem book. At least one reader, Philipp von Zesen in his *Coelum Astronomico-Poeticum* (1662), actually called Schiller's a project of "Christian Emblems." In this genre, authors presented each illustration (first from woodblocks, later from copper-


66 The School of the Heart.

Embleme 17.

CORDIS MVNDATIO.

Lava a malitiâ COR tuum. Jirem. 4. 14.

Fons ſcaturit lateris tranſfixi vulnere ſponſi
Hoc CORDIS maculas ablue, ſponſa, tui.
Michel van Lochem excu.

17

The School of the Heart. 67

The Cleanſing of the Heart.

JER. 5. 14.

O Jeruſalem, waſh thine Heart from wickedneſs, that thou maiſt be Saved.

Epigr. 17.

Out of thy wounded Husbands Saviours ſide,
Eſpouſed Soul, there flows with a full tide
A Fountain for uncleanneſs: waſh thee there,
Waſh there thine heart, and then thou need'ſt not fear.

ODE. 17.

1.

O endleſs miſery!
I labour ſtill, but ſtill in vain
The ſtains of ſin I ſee
Are oaded all, or di'd in grain.
There's not a blot
Will ſtir a jot
For all that I can do.
There is no hope
In fullers ſope,
Though I add nitre too.

2.

I many ways have tri'd,
Have often ſoakt it in cold fears,
And, when a time I ſpi'd,
Powred upon it ſcalding tears,
Have rins'd, and rub'd,
And ſcrap't and ſcrub'd,

And

Figure 4. Example from a religious emblem book, including motto, image, scriptural passage, and epigram. From *The School of the Heart*, third edition, 1676, adapted by Christopher Harvey from Benedictus von Haeften's *Schola Cordis*, 1629. (Credit: Reproduced with the permission of Rare Books and Manuscripts, Special Collections Library, the Pennsylvania State University Libraries)

plate engravings) with a motto, a title, and an explanatory epigrammatic poem (Russell 1995). To these elements, religious emblem books often added an apt scriptural passage (Figure 4)–a procedure followed by both Drexel and Schiller (Table 1).

The prime mover in this tradition was the *Emblematum liber* ("Book of Emblems") of the Italian jurist Andrea Alciato. By the time of his death in 1550, Alciato had expanded the original (1531) edition of 104 Latin emblems to 212 on subjects ranging from the seven deadly sins to the nature of love. Alciato's new form, along with his talent for a particular sort of "riddling, moral poem", brought continent-wide success, and by the end of the seventeenth century his book was republished in an astounding 171 editions, including translations into the major European vernaculars[1].

We can attribute some of the wide appeal of this form to its great versatility: various Renaissance emblem books took up sacred and secular, moral and amorous,

[1]See The Memorial University Web Edition of Alciato's *Book of Emblems* available at http://www.mun.ca/alciato/.

Catholic and Protestant, personal and heraldic themes. Regardless of subject, the emblem presented the author's interpretive pairing of text and image while inviting the reader to engage in a parallel feat of interpretation. Renaissance readers delighted in the invitation. Around 1577, in the margin of his edition of Erasmus' *Parabolae sive similia*, a book of analogies and similes (housed in the Folger Library), the English scholar Gabriel Harvey wrote "Nihil similius his similibus, quam Emblemata / Alciati, Iouij, Ruscelli" ("Nothing is more similar to these similitudes than the Emblems of Alciato, Giovio, Ruscelli"). For readers like Harvey, the emblem was not simply a popular mode of analogical thinking–it had become one of their paradigms.

But why specifically might Drexel and Schiller have turned to the text-image pairing for their Christianizing projects? For Drexel, the Jesuit teacher of rhetoric, providing verbal descriptions of his images also allowed him to work within a mode widely associated with his order–some of the most enthusiastic Catholic producers of emblem books–while making what he called his Christian "signs" more vivid and memorable (Lewalski 1979). His new signs consisted of three elements: mottos (e.g., "An Internal Light"), which 'for the helpe of memorie beare each one their Device or Emprese in the front of them" (e.g., "A Burning Torch"), and appropriate passages from scripture (e.g., "Thy Word is a Lanthorne to my feet, and a light unto my paths". Psalm 118).

Drexel intended for his readers to envision not new images in the sky but new virtues in themselves: "diligently [to] marke how many of these signes thou discover'st in thy self" (Drexel 1633). His treatise includes no star maps and his illustrations no stars. Rather, the zodiac functions here more like a rosary or a cycle of spiritual exercises; it gives order to devotional practice. In characteristically Jesuit fashion, the terms in which Drexel describes his signs marry the language of emblems ("motto", "device") with that of the Ignatian spiritual exercises.

For Schiller, the goals of his zodiac were far more practical than meditative. His method even more closely resembles that of the emblem book: he provides *actual* images for each constellation, mottos (all borrowed openly from Drexel), scriptural passages for some of the signs, and–in lieu of an epigram–an explanatory paragraph for each. Here, his main interest is explaining why each apostle in his zodiac is appropriate to a motto from Drexel. St. James the Greater, for example "changes the third sign, namely Gemini. He is that James to whom may be adjoined 'Readiness for death,' which he first of the Apostles suffered; nor when Christ offered him that bitter cup did he delay in accepting it".

Schiller had at least three likely reasons for choosing the emblem-mode: 1) reworking Drexel's mottos allowed him to draw on Jesuit authority for his revisionary project, 2) associating each apostle with a specific quality and Biblical episode provided his zodiac with a story-appeal comparable, in kind if not in quality, to the old constellations (not, say, an apotheosis but a martyrdom), and 3) the emblem-complex of image, text, and title aims to make the new signs comparably memorable.

To this end, anticipating the concerns of his critics (see Section 7 below), Schiller consolidated several mnemonic strategies in the hope, no doubt, of permanently supplanting the ancient signs and constellations. In a later section of the atlas, he assigns new symbols to his new zodiacal signs (Table 1): for each apostle, either a signal object (for Peter, a key) or, more often, the instrument of his martyrdom (a saw, a two-edged axe, a club). Schiller even goes as far as to rewrite an old mnemonic distich on the zodiac so his readers can more easily remember these new symbols.

Table 1. Comparison of the Nomenclature of Bayer, Drexel, and Schiller

DREXEL			SCHILLER			BAYER	
#	Motto	Symbol (& Biblical Ref.)	#	Apostle	Symbol	Name	Symbol
1	An Internal Light	Burning Torch (Psalm 118 (119):105)	4	John	Cup	Cancer	
2	Readiness to die	Skull (Philippians 1:25)	3	James the Greater	Staff	Gemini	
3	Frequent use of sacraments	Chalice & Host (John 6:58)	9	Matthew	Two-edged Axe	Sagittarius	
4	Contempt of worldly things	Bare Altar (Philippians 3:7)	1	Peter	Key	Aries	
5	Patience in the midst of long affliction	Prickly Rose Bush (Luke 6:21)	8	Bartholomew	Knife	Scorpio	
6	Frequent listening to sermons	Fig Tree (Proverbs 1:5)	10	Simon	Saw	Capricorn	
7	Giving alms	Balsam Tree (Eccl. (Sirach) 17:12)	7	Philip	Small Cross	Libra	
8	Self-contempt	Cypress Tree (Matthew 18:3)	12	Matthias	Axe	Pisces	
9	Love of our enemies	Two Thwarted Lances, Olive Wreath (Romans 12:21)	6	James the Lesser	Fuller's Club	Virgo	
10	Detesting our past sins	Rod and Scourge (Rev. 2:5)	5	Thomas	Spear	Leo	
11	Propensity of our will to do good	Anchor (Psalm 118 (119):112)	2	Andres	Decussated Cross	Taurus	
12	Moderations of our passions	Strung Lute (Genesis 3:16)	11	J. Thaddeus	Club	Aquarius	

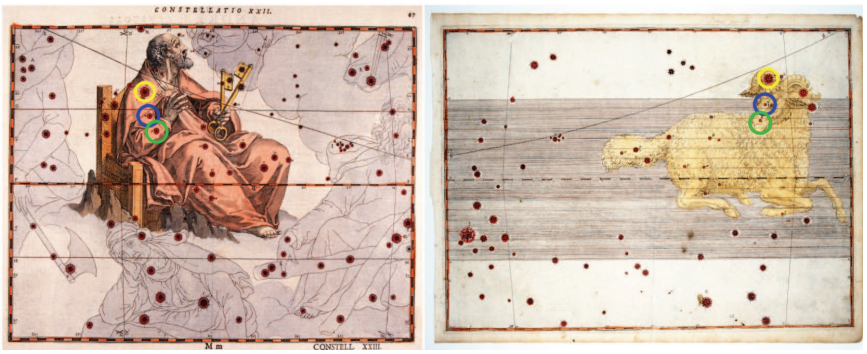


Figure 5. The locations of the same three stars in the constellations St. Peter (left panel) and Aries (right panel). Note that Schiller's plate contains many more stars than in Bayer's. (Credit: Mendillo Collection)

6. Specific Example: Aries

For each constellation, Schiller gives a detailed description of each star's position within his new image from Holy Scripture, with cross reference to its location in the classic images of the pagans. We illustrate this tedious task using the constellation Aries, which becomes St. Peter. Aries traditionally marks that point in the sky where the Sun is found on the date of the Vernal Equinox (approximately March 21). This "First Point of Aries" had long been considered the origin of the coordinate system used by astronomers for celestial longitude (Aries is thus the Greenwich of the sky). For this reason, says Schiller, St. Peter, the leader of the apostles and "first among equals", is the figure appropriate to replace Aries. Schiller provides a star-by-star replacement for over thirty stars in Aries, relating their locations in St. Peter's portrait to those used in Bayer's depiction of Aries. To be even more complete, Schiller occasionally adds references to Aries as described by other celestial map makers. A sample of this approach is given in Table 2 using only the first twelve stars in Schiller's St. Peter.

To appreciate the effort and complexity of this undertaking, we indicate in Figure 5 how stars #3, #4, and #5 are treated in both systems. The star circled in yellow is the bright one in St. Peter's shoulder that formerly was said to be in the ram's right horn; the star circled in blue (in the saint's right arm) had previously been described as in the ram's left eye; the star circled in green is on the same arm near St. Peter's wrist, replacing its location at the snout of Aries. This remarkable devotion to detail was clearly needed if the new nomenclature being proposed was to be adopted and used by astronomers. Schiller's friend and colleague, Johannes Bayer, probably provided key collaboration in this effort.

7. The Reaction of Astronomers

Johannes Hevelius was born and died on 28 January in the years 1611 and 1687. He was the only son of a wealthy brewmaster and prominent Lutheran citizen of Danzig (now Gdansk, Poland). In 1630, he went to the University of Leiden to study Law with paternal hopes that he would become an active public figure. While at university, how-

ever, he developed a fascination with astronomy, mathematics, optics and mechanics. To advance those interests he embarked on a tour of European centers of learning, with plans to visit Galileo in 1632 (the year prior to the great astronomer's trial). When news arrived about more urgent family matters, Johannes had to cancel his visit to Florence and return home to run the brewery. With ample resources to support his avocation, Hevelius created a great observatory above his home, equipped with naked-eye and telescopic instruments that he designed and built. With these state-of-the-art capabilities he became a major force in astronomy, much to the surprise of scientists in other countries. In England, for example, discussions at the Royal Society about the accuracy of his observations resulted in the bright young astronomer Edmond Halley departing for what we would today call a "site visit" to assess the reality of Hevelius' results. Halley left very impressed (Cook 1998).

Hevelius is then a worthy authority on whom to base our assessment of Schiller's reception. Hevelius had observed so many new stars that he ultimately proposed a total of forty new constellations. By his own account, he struggled with the question of how to name them. The choices, as he saw them, were to find Christian names to add to Schiller's plan, or to come up with his own. Explorers on great voyages of discovery had never been shy about naming their new findings as they saw fit. Magellan had done so for terrestrial findings. For the heavens, Galileo felt he clearly had the right to name the moons of Jupiter after the Medici in his *Starry Messenger* (1610). In the crowning achievement of his life, Hevelius produced a great celestial atlas that he named *Firmamentum Sobiescianum* (1687). In the very title Hevelius tips his hand, for he named his famous set of star maps after the King of Poland, John III Sobieski.

The influence of Schiller is immediately evident in the *Firmamentum*: where Schiller's frontispiece had depicted Jesus, flanked on either side by major figures from the Bible (e.g., Moses, John the Baptist) and holding court on a cloud, Hevelius' frontispiece depicts a cloudy court of great astronomers in similar array around Urania, the pagan muse of astronomy (Figure 6). Among these ancient and modern luminaries, ranging from Ptolemy to Tycho, Schiller is nowhere to be found.

Hevelius chose the same "external view" scheme adopted by Schiller, but the similarities were to stop there. To address the possible complaint that he was not a good Christian astronomer, he devoted five full pages of his preface to defending his rejection of Schiller's nomenclature:

> Indeed necessity demands that we Christians root out utterly all those things which take their origin from the pagans and all those which incline toward idolatry... It seemed at the beginning, before I considered the matter more deeply, that it would also have been glorious for me, if I had kept on [Schiller's] footsteps.

But, he explained, there were reasons not to do so:

> All my work would be in vain: in the sixty years since [Schiller's atlas], no astronomer has found any occasion, either in formal written work or letters, disputations or dissertations, to follow Schiller's opinion on the names of the constellations.
>
> And the reason is that even though the Starry Christian Heaven is widely available, nevertheless it is not universally convenient and marketable, and worse it is owned by very few among the learned.

Table 2. Example of Schiller's description for the first twelve stars in his constellation St. Peter with cross-reference to their counterparts in Bayer's Aries.

Of Saint Peter	Of Aries
1. In the back of the Chair of St. Peter (which we present in imitation of the true one which is guarded at Rome) preceding and rather south of two more discernable stars. These stars, it is said, are the first of all the stars in the firmament, [including for example that star from which the Astronomers begin the *Uranometria* [Heaven-measuring] and *Annus Sidereus* [Sidereal Circuit]. More concerning the same star below on this very page.	1. South on the preceding horn. For the authors of the tables, the first [mentioned] of all [the stars].
2. Following to the north.	2. West and following on the same horn. These two are said to be more brilliant *Scarthai* [sic], that is the equal servants of Aries
3. The very bright star in the right shoulder.	3. The bright star on top of the head, the first among certain others. For Bayer, it was in the right horn and numbered 14. For Clau. [sic, Clausus?], not part of the figure but above the head.
4. Which is under the shoulder joint or in the right arm.	4. In the northern of the two open jaws. Bayer: at the left eye; the same for Clau. #3.
5. Lower on the same arm, near the joint of the hand.	5. Which is more to the South [than #4]. Clau. #4 and Bayer: on the snout.
6. The third on the back of the Chair which sits most to the south.	6. On the neck. Clau. #5 and Bayer at the nape.
7. At the navel.	7. In the loins. Clau. #6, Bayer #17. On the back or upper loins.
8. In the left thigh.	8. Which is on the [haunch] or the base of the tail. Bayer and Clau. #7.
9. Of the three at the left knee, the one that comes first and to the south.	9. The first of three on the tail. Clau. and Bayer #8.
10. The middle [of those three], and north.	10. The middle star of that sequence. Clau. and Bayer #9.
11. The third and last [of those three].	11. The last. Clau. and Bayer #16.
12. On the right shin following two others.	12. On the thigh. For Bayer, on the rear thigh. And the same for Clau. #11.

Figure 6. Frontispiece to Hevelius' *Firmamentum Sobiescianum sive Uranographia*, 1690. Note the similarities to Schiller's frontispiece in Figure 1. (Credit: Collections de la Bibliothèque Jagellonne, Cracovie and the State Archives of Poland)

> No globe has ever been made using Schiller's method.
>
> Schiller's nomenclature is not convenient (i.e., too many words needed to specify positions), and it is annoying, bothersome, and tedious.

To drive home these points, he suggested to his readers the following possibility:

> For example, if someone were to write that he had observed a comet in the little ship of St. Peter near the star on the northern border of the ship, near the third of the bright stars along the oar, and that the comet had proceeded from that spot beneath the fourth star near the ship's stern, in the ropes of the fishing net, heading toward a star on the stern just behind the third oar…
>
> Who, I ask, of all the most learned men to date, could ever have understood or embraced these descriptions when they confound rather than please the reader's mind with their own obscurity?

While such an example was certainly contrived to amplify complexity, Hevelius then offered what he felt would be the traditional way to describe the same thing:

> Couldn't these details have been expressed, good reader, much more quickly and clearly–as even novices might understand–as "A comet has been observed in Ursa Major near the first star of the tail and that it migrated from there under the middle star of the tail to the last"?

Hevelius' concluding point is as relevant today, and perhaps more so, as it was for astronomers in the 17th century:

> Since human life is precious and brief, we have to spend our time rather in acquiring a more perfect understanding of matters not yet satisfactorily detected in Astronomy than in overwhelming the memory with new inventions of terminology and names (except as is necessary).

8. Assessments

Faced with a lack of detailed motivation provided by Schiller for his great project, we offer some possible avenues of analysis. At first we might be tempted to consider Schiller's project a conservative Catholic response to the threat posed by Galileo's work. Yet, Schiller clearly valued the scientific yield of the telescope–he included hitherto unseen stars in his atlas. Schiller's publication date and death (1627) preceded Galileo's trial (1633) and, given the amount of time required to produce such an atlas, he would have initiated work several years earlier. In 1616, Galileo received his initial censure concerning Copernicanism from Church authorities, and his bold and provocative writing style in *The Assayer* (1623) attracted attention. Nevertheless, there is no evidence in Schiller's introduction that Galilean discoveries or their implications played a motivational role.

Schiller's is first an Augsburgian project: a collaborative act of piety that attracted his schoolmate Drexel and his colleague Bayer. Their shared sense of Catholic duty must have been shaped by a city that had long been a focal point in the Protestant-Catholic controversy (e.g., the Augsburg Confession of 1530, the Augsburg Interim of 1548, and the Peace of Augsburg in 1555). We should also note that the emblem tradition itself had strong connections to the city, the first three editions of Alciato's *Emblematum liber* having been published there.

As a cultural phenomenon, the revisions advocated by Schiller also form a solidly Counter-Reformation project. In attempting to further an ancient science, the *Coelum Stellatum* asserts Christian primacy over pagan influence while strikingly reaffirming the spiritual value of an image-centric piety, and we should not be surprised that Protestant astronomers (e.g., Hevelius) found the grounds to disapprove. Schiller's work is not then iconoclastic but iconomorphic; it attempts a revision and reformation of the image that draws strength of precedent from the Catholic emblem and meditative traditions. Schiller's finely wrought style of illustration also reminds us that Counter-Reformation movements in art contributed to the development of a continental Baroque.

Like the Reformation, the Thirty Years' War (1618-1648) was, in many ways, an event centered in Germany (Marshall 2009). As a final supposition, we might consider the practical value that Schiller, who had lived to see the Jesuit-sponsored Counter-Reformation give way to the indiscriminate carnage that swept the German countryside, would have found in retreating to his studies, not merely for intellectual distraction but to effect a more perfect, more peaceful reformation in the stars.

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