

HAMLET'S LOVE LETTER and the New Philosophy

Peter Usher



*As new philosophy arrests the Sun,
And bids the passive earth about it run . . .*

John Donne, Verse-Letter to the Countesse of Bedford



IN Shakespeare's *Hamlet*, Polonius, the chief minister of the Court of King Claudius, reads a love letter to the royal couple that Hamlet wrote to Ophelia. Polonius presents it as evidence for the correctness of his conclusion that love for Ophelia has made Hamlet mad. The contents of the letter are puzzling, as is the verse in it. Since the first two lines of the verse concern the two basic tenets of the medieval cosmic worldview, this article takes a fresh look at the subject from the standpoint of the New Philosophy that emerged in the sixteenth century. A literal interpretation of the love letter indicates that Hamlet is indeed in love with Ophelia, although he was not at his literate best when he wrote it. The love letter and its peculiar style are more readily understood, however, when viewed from the standpoint of the cosmic allegorical interpretation of the play.

The sun is "lost"

In 1611, in an oft-quoted passage from *The First Anniversary, An Anatomy of the World*, John Donne ventures to say that people are confused about whether the Earth or the Sun is the center of the planetary system, and that the "element of fire is quite put out" by the New Philosophy:

And new philosophy calls all in doubt,
The element of fire is quite put out.
The sun is lost, and th'earth, and no mans wit
Can well direct him where to look for it . . .
'Tis all in pieces, all coherence gone . . .

Here Donne refers specifically to the two basic physical concepts behind the New Philosophy, viz. the Sun-centered model of the planetary system, introduced in 1543 by Nicholas Copernicus (1473-1543), and the new model of the starry firmament introduced in 1576 by Thomas Digges (c. 1546-1595).

The New Philosophy is a product of the Renaissance, starting perhaps in the early sixteenth century with the work of Leonardo da Vinci (1452-1519), but generally regarded as having begun in 1543 with the heliocentric model of Copernicus. The New Philosophy is “the accumulation of facts about nature and the development of a critical and objective method of observing the phenomena of the physical universe” (Coffin 65). This new organon assails the *Old Philosophy* whose methodological principles and beliefs stem from the philosophers of ancient Greece and their followers. The New Philosophy includes the so-called New Physics which holds *inter alia* that the four basic elements of the physical universe are earth, water, air and fire. Those parts of mainly astronomical relevance, such as the kinematics of the Moon and the modern planets, are known as the *New Astronomy*. According to conventional wisdom, the New Philosophy culminated with the work of Galileo Galilei (1564-1642), noteworthy among which is *Sidereus Nuncius* of 1610 in which he announces telescopic discoveries about the nature of planets and stars, and *Due Nuove Scienze* which was printed in 1638 after a delay caused by censors, and which contains a cogent statement of the experimental method of inquiry along with practically all that Galileo had to say on the subject of physics (Berry Sections 133-4).

In referring to things astronomical, Shakespeare seems to accept the edicts of the Old Philosophy. In *Julius Caesar* (3.1.61-67) the Emperor says the sky is “painted with unnumber’d sparks” which “are all afire and every one doth shine.” In *Coriolanus* (5.4.46) a messenger measures certainty by knowing that the Sun is fire, and in *Macbeth* (1.4.50) the Thane of Glamis commands the stars to hide their fires. In *Hamlet* of c.1601, Prince Hamlet refers to “this brave o’erhanging firmament, this majestical roof fretted with golden fire” (2.2.283-5), but the remarkable fact is that in this play Shakespeare alludes directly to those same two components of the New Philosophy to which Donne alluded about a decade later and, like Donne, does so in the context of “doubt.”

Moreover, according to the cosmic allegory (Usher “Support”), the two components in question play such an important role that in *Hamlet* Shakespeare dubs them Hamlet’s “transformation” (2.2.5-6). This change results, literally, from the antic disposition that Hamlet puts on, but the word also has a technical meaning first used by Thomas Digges. Hamlet is *transformed* by the heliocentric subversives at the University in Wittenberg as well as by the treasonous apparition from the starry sky. In effect, Hamlet’s new disposition refers to what may be seen as the mathematical transformation of the two boundaries of the old cosmic worldview (Usher *Bulletin AAS* 1996, 1997; *Giornale; Elizabethan Review*).¹

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Shakespeare describes Hamlet's transformation at the start of 2.2, the very scene in which he places Hamlet's love letter to Ophelia and in which he alludes to "infinite space." Polonius, Ophelia's father and chamberlain to King Claudius, reads the love letter to the King and his new wife Gertrude, Hamlet's mother. The full text of the love letter (herein simply "the letter"), as read by Polonius, excluding what he censors ("et cetera"), is as follows (2.2.115-8):

To the celestial, and my soul's idol, the most beautified Ophelia,
In her excellent white bosom, these, et cetera.

Doubt thou the stars are fire,
Doubt that the Sun doth move.
Doubt truth to be a liar,
But never doubt I love.

O dear Ophelia, I am ill at these numbers, I have not art to reckon my groans;
but that I love thee best, O most best, believe it. Adieu.

Thine evermore, most dear lady, whilst this machine is to him, Hamlet.

This letter has been described as "a great puzzle" and the quatrain as "affected, juvenile, and graceless" (Edwards 2.2.109-22n, 2.2.119n). Its several references to things astrophysical and astronomical prompt examination from the standpoint of the New Philosophy. In particular it behooves us to seek its relation to the cosmic allegory.

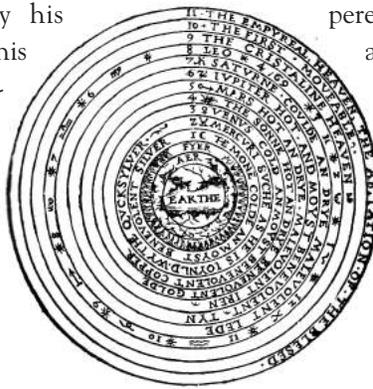
Bounded geocentrism

Neither Plato nor Aristotle was an astronomer, but Aristotle nevertheless proceeded to develop a theory of physics and cosmology. His theory dutifully adhered to the Platonic simulacrum of a spherical, bounding Firmament of stars centered on the Earth, about which revolved the seven ancient planets: the Moon, Mercury, Venus, Mars, Jupiter and Saturn. Aristotle developed his cosmological theories in *Physis*, *De Caelo* and *Meteorologica*. His writings on logic upon which much of his physical theory is based are now compiled in *Organon*. He may have written other material now lost, but concerning the cosmos, available information indicates that he ignored the contrary opinions of several Pythagoreans of the sixth and fifth centuries B.C., who posited a rotating Earth (Berry *Section 24*); he did not entertain seriously the possibility that geokineticism could account for the apparent diurnal rotation of the Firmament; nor did he countenance the possibility that the Earth might move through space. Aristotle made positive contributions in all areas he studied "save in physics and astronomy" (Dampier 30) because he relied on his own intellectual virtuosity to the exclusion of counter-intuitive possibilities and empirical evidence, and so put cosmology on the wrong track for well-nigh two millennia.

As for the physical properties of stars, the idea that they are "fiery" can be traced to

Anaximenes in the 6th century B.C. (Dicks 46). Parmenides of Elea (c.512-450 B.C.) and Empedocles of Acragas (c.493-433 B.C.) later asserted that fire is one of the four elements of the material world and that the Sun and stars are made of it. Plato too subscribed to that view (Dicks 131), though Aristotle departed somewhat from his master's belief and asserted in *De Caelo* that friction ignites the air around the stars as they and the planets move in their orbital spheres (Heath *Greek* 73-4). Moreover, in *De Caelo*, Aristotle strove to demolish the theory of the atomists who believed in an infinite universe of worlds (Dicks 199, Heath *Aristarchus* 240-1, Johnson 40-1).

Organon includes demonstrations of deductive reasoning through use of syllogisms, but of course these are only as useful as the validity of their premises (Weaver 35). As a result, Aristotle's astrophysical theory was hampered by the limits of his imagination and we now know that it was fatally flawed by his peremptory neglect of the possibility of a moving Earth. Such was his authority that when Aristarchus of Samos (c.310-c.230 B.C.) advocated a two-fold terrestrial orbital revolution), he received nothing but grief for his trouble, the Stoic Cleanthes (3rd century B.C.) asserting that it was his duty to indict him on charges of impiety for "putting the Hearth of the Universe [i.e. the Earth] in motion"



The Ptolemaic Universe as portrayed in Andrew Borde's *The First Book of the Introduction to Knowledge*, 1542.

Through Arab philosophy filtered piecemeal via Spain and religion of western went many translations, and developed ideas of their own at the time. Various schools of thought is now generally known as Aristotelianism. Eventually the authority of the Athenian philosophical tradition became so entrenched and its arguments so persuasive that the Christian church incorporated Aristotelian cosmology into their dogma. As a result, bounded geocentricism became the standard of theological correctness in Europe throughout the Middle Ages and was still widely accepted at the turn of the seventeenth century, about the time the final version of *Hamlet* was written.

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The "New Philosophy"

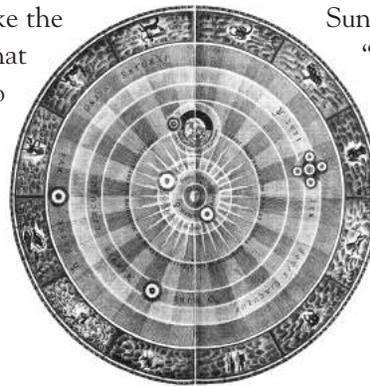
Copernicus (1473-1543) posed the first significant threat to the Aristotelian-Christian hegemony, but, due to his fear of political repercussions, he withheld details of his work for over thirty-five years (Copernicus 5). By about 1529 he had completed *Commentariolus* in which he made a preliminary case for a Sun-centered (heliocentric) planetary system. Thanks to the timely intervention of Georg Joachim (1514-1576) and the Lutheran preacher from Nuremberg, Andreas Osiander (1498-1552), the full treatise, *De Revolutionibus*, finally appeared shortly before his death. Osiander took responsibility for publication of the treatise but became so alarmed at its novelty that

he added the words *Orbium Celestium* to the title, with an unsigned prefatory note explaining that the work was merely algorithmic in nature and was not to be taken literally (Berry Section 74).

Like Aristarchus before him, Copernicus posited a heliocentric planetary system in which the Earth is relegated to the rank of a planet, but with the Moon's orbit remaining geocentric. But he left it to "the philosophers of nature" to decide whether the Universe is finite or infinite (Copernicus 17).

In 1556, heliocentrism started to take root in England, and twenty years later Thomas Digges published a short work entitled *A Perfit Description of the Caelestiall Orbes . . .* which he appended to a popular almanac that he edited. In it he criticized Aristotelian physics and astronomy, and proposed a model of the universe that imbeds a Copernican heliocentric planetary system in an infinite universe of stars like the Sun. He was not fooled by the Osiander ploy, for he wrote that "Copernicus meant not as some have fondly excused him to deliver these grounds of the Earth's mobility only as Mathematical principles. . ." (Johnson & Larkey 79).

Digges's model is diametrically opposed to the old model of bounded geocentric Athenian philosopher who seeing (no doubt) the sons in seeking to confute the words: *De his explicatum est ea explanation of these things is* Rather, Digges implicates



The sun-centered Copernican Universe as engraved by Andreas Cellarius, 1660.

schoolrooms and elsewhere who, he says, were led to bounded geocentricism chiefly on that philosopher's authority and so whose minds were closed to other possibilities.

In the sixteenth century no poet grasped the full significance of the new cosmological worldview, save one. According to the cosmic allegorical interpretation of *Hamlet*, Shakespeare devotes an entire sub-text to an account of the rise and establishment of the new worldview instigated by Copernicus and furthered by Digges. As a child, Thomas Digges was tutored in mathematics by John Dee (1527-1608) (Johnson 135), England's foremost mathematician, who counted astrology among his many interests. Dee was retained by Lord Robert Dudley (1532/3-1588), the Earl of Leicester, to whom Digges dedicated his 1578 book *Stratitoticus*, and for whom he named his eldest son, Dudley Digges (1582/3-1639). Lord Leicester was a devotee of mathematics and a patron of letters and the stage. It was to his company that the first royal patent for actors was granted.

Edward de Vere was about four years younger than Thomas Digges, and just as Dee tutored Thomas, so perhaps he might have tutored de Vere, although the panegyric that there was no-one better than de Vere to mark "the seven turning flames of the sky" (Ogburn 474) was probably due to his tutor Sir Thomas Smith, another dedicated astrologer (Dewar 65). Dee, Smith, de Vere, Digges, and Dudley were all variously connected, so it is reasonable to speculate that it was due to Smith and possibly also to Dee that de Vere may have known of Digges's work of 1576.²

The letter

Events leading to Polonius's reading of Hamlet's letter in 2.2 begin at 1.3.132-4 where Polonius forbids Ophelia to have further contact with him. But in 2.1 Ophelia complains that Hamlet has frightened her. Polonius asks her whether Hamlet is mad for her love. She does not know the answer, but tells her father:

. . . as you did command,
I did repel his letters, and denied
His access to me. (2.1.106-8)

—which causes Polonius to conclude: “That hath made him mad.” Polonius must protect his daughter from this madman, but is not about to tangle directly with the heir to the throne. So he resolves to bring Ophelia and report the results to the King.

In 2.2, Polonius enters without Ophelia, but comes armed with a letter to her from Hamlet. The letter must have been written and delivered before Ophelia began refusing to see him or accept his letters (Wilson 113). After Hamlet frightened her, she must have handed it over to her father. With this letter in hand he has no need for testimony from his daughter, for in itself the letter is damning. Polonius does not even finish reading the first sentence before Gertrude asks in disbelief: “Came this from Hamlet to her?”

The verse

Hamlet begins his letter by addressing Ophelia as “celestial,” and proceeds to inflict four lines of doggerel upon her (2.2.109, 115-8). For ease of reference let the four lines of this verse have labels L1, L2, L3 and L4. In the first two lines LL1,2, Hamlet refers to the stars and the Sun. Line L3 is a trite observation on truth and falsity, and line L4 says that Hamlet loves Ophelia. The word “doubt” leads off LL1-3, and recurs in L4. The repetition sounds imperious. Is Hamlet so liberal with advice as to burden his innamorata with celestial and philosophical inanities? Whereas the stars might serve the interests of romance quite well, it is more likely that the Moon provides the desired ambience, yet Hamlet is apparently so gauche that he ignores that luminary in favor of the Sun.

LL1,2 assume “the certainty of what has now begun to be doubted” about the old Ptolemaic *weltanschauung* (OED, Jenkins 2.2.116n, Edwards 2.2.117n). LL1,2 refer specifically to properties of the old picture of stars and planets shining by virtue of the element fire, and the Sun moving, literally, around the Earth. The verb “to doubt” means “to be uncertain or divided in opinion about” or “to call into question” (OED) with the sense exemplified in 1513 by: “. . . not doubting that he should find . . .” and from 1664: “I do not doubt that I shall find . . .” The verse begins, therefore, by urging Ophelia to doubt the two cherished beliefs of the standard cosmology of the day.

In L3 there is a change of subject. If we believe that “truth” refers to the totality of real things, events and facts, then L3 means in effect that Ophelia should doubt that this grand ensemble of knowledge and lore is associated with “a liar.” So the verse leads off by urging denial of properties

of the generally-accepted cosmic worldview with which hardly anyone at the time would agree, only to be followed, anti-climactically, by a truism that no-one would dispute.

As a result there is a distinct lack of parallelism between LL1,2 and L3. No right-thinking Christian should doubt the truths of the Old Philosophy, but all should doubt that truth is a liar. This is not the end of the verse however, so perhaps L4 can shed light on the matter. Consider first, the meaning of LL1,2 in connection with L4.

L4 begins with the conjunction “but” that often introduces “a statement of the nature of . . . [in] contrast to what has gone before” (OED), so a meaning for LL1,2+4 emerges that is something like: (1a) If she pleases, Ophelia can doubt the foundations of the contemporary worldview, but she should not doubt Hamlet’s love for her. Or, what amounts to the same thing: (1b) Ophelia should doubt two sacred verities of contemporary cosmology before she doubts Hamlet’s love for her.

In other words, no-one doubts matters that all agree are plainly true (i.e. no-one doubts the sacred verities of bounded geocentricism), ergo Ophelia should not doubt Hamlet’s love either. Given the lofty quality of these standards of truth, Hamlet shows that he loves Ophelia in the most perfect way possible, because among the common beliefs of the day is the conviction that perfection resides only in the heavens. This explains Hamlet’s epithet “celestial,” with which Hamlet compliments Ophelia in the most flattering terms possible.³

Next consider the problem line L3. It seems hardly possible that it ends with “liar” simply because the poetaster needs a word to rhyme with “fire,” because, given its vacuous meaning, the function of L3 would then be simply to fill up space. The quality of the writing supports the idea, yet, knowing Hamlet (and Shakespeare), it’s implausible to think that there’s nothing more to L3.

Some believe that *doubt* in L3 could have the “weakened sense” of *suspect* (OED; Edwards 2.2.117n), the argument being that the sense of *doubt* in L3 is similar to the sense of *doubt* appearing in 2.2.56 some fifty lines earlier, where Gertrude suspects the causes of Hamlet’s disposition, even though of course she does not actually know them. The word *suspect* signifies suspicion, but to suspect that truth is falsity only injects an element of uncertainty into something that devotees of Aristotelianism would agree is plainly false (viz. that truth is a liar), and so would reject out of hand. For example, simple counting reveals the truth that one and one are two, neither more nor less. Such truths are not in doubt.⁴

Suppose instead that a weakened sense of “doubt” obtains in LL1,2 rather than L3. Then LL1,2 urge Ophelia to “mistrust,” or hesitate to “believe,” or hesitate to “trust” (OED), as in fact we have already argued in arriving at the two equivalent interpretations (1a) and (1b) above. In other words, LL1,2 are simply rhetorical, and Hamlet uses them to make his point (that he loves her so much). In LL1,2, therefore, Hamlet establishes standards of truth that Ophelia should deny in order to show by comparison how much he loves her, whereas in L3 he writes of something that is simply true in its own right. Thus a weakened sense of “hesitation to believe” does not resolve the orthogonality of LL1,2 and L3. If Shakespeare had desired parallelism throughout LL1-3, then in L3 he should have made that which Ophelia should doubt a rhetorical hypothetical as well.

A possibility is that L4 has a different meaning when used with LL1,2 than when used with L3. In the explanation of LL1,2+4 above, “but” in L4 has the meaning of “exception,” however

“but” can also express “disconnexion” (OED). In that case “but” serves to introduce “a distinct or independent fact” as might occur in the minor premise of a syllogism, and has a closely equivalent meaning of “moreover” (OED), though “and” would do as well. The implication is that the combination LL3+4 contains two “distinct or independent” facts, viz:

- (2) Ophelia should doubt something that is plainly false,
and she should never doubt Hamlet’s love for her.

This differs from the likely meanings (1a) and (1b) of the combination LL1,2+4, which is in brief that:

- (1) Ophelia may doubt two sacred verities of contemporary cosmology
but must not doubt Hamlet’s love for her.

The difference occurs because the meanings of LL1,2 are contingent on the meaning of L4, whereas in L3 and L4 the two meanings are independent.

Edwards (2.2.117n) writes that each of LL1,2,3 “means the same,” viz. that Ophelia “may challenge the unchallengeable.” Though this interpretation is more pertinent perhaps to the combination LL1,2+4 than LL3+4, in a loose sense the net effect is the same:

- (3a) No matter what, whether she doubts things that are true
 or doubts things that are false, Ophelia should not doubt
 Hamlet’s love for her.

Thus with due respect for the lofty ideals that obtain in the celestial realm, the literal meaning of the verse reduces simply to:

- (3b) Above all, Ophelia must not doubt that Hamlet loves her.

“This machine”

Hamlet signs off by calling himself “this machine” (2.2.121-2). Most critics agree that “machine” refers to Hamlet’s body (Edwards 2.2.121n, Hibbard 2.2.123n, Jenkins 2.2.122-3n), a sense of the word that is unique in the Canon. It is the first example cited in OED 4c, in which the human or animal “frame” is seen “as a combination of several parts.” Perhaps the young man sees himself as fully functional, a fact of interest to Ophelia, no doubt. The construction “this machine is to him” is analogous to the idiom “there is a great deal to him,” so regardless of whether or not Hamlet is expressing contempt for corporeal life, the general sense is that he pledges devotion while his “bodily frame belongs to him” (Jenkins 2.2.122-3n). To reduce love to mechanical terms is crude in the extreme, however, and Hamlet comes off looking like an unfeeling and artless suitor.

Moreover, by elevating his love for Ophelia to divine status, the earnest swain oversteps his

bounds, because it is ridiculous—even blasphemous by the standards of the day—to think that anything terrestrial can aspire to celestial perfection (excluding of course the divine gift of the soul, which is not at issue here). The double superlative at 2.2.120: “I love thee best, O most best, believe it” emphasizes the extremity of his devotion. In fact, throughout the letter there is an abundance of superlatives and adjectives. His grammatical constructions are convoluted. Hamlet’s scribbles are grist to the pedant’s mill, for Hamlet seems grossly enamored of Ophelia yet is apparently unable to write from the heart. Polonius, it seems, is right: Hamlet is in love, but mad.

The allegory

It is common to find persons who appreciate and recite poetry yet cannot write it themselves, but there is no evidence in the text or elsewhere in Shakespeare’s sources that says that unrequited love engenders illiteracy. Hamlet demonstrates knowledge, not just of contemporary cosmology, but, in the selfsame Scene 2.2 in which Polonius reads his letter, he demonstrates further cultural sophistication by reciting, apparently at the drop of a hat, a dozen or so lines from a poem about “rugged Pyrrhus.” Even Polonius is impressed, but after Player I takes over and recites thirty more lines, the pedant interjects: “This is too long.” Modern readers wonder about this too, but here the Bard is drawing attention to Hamlet’s education and his love of the arts.

Hamlet ignores Polonius’s objection and urges Player I to continue, which he does for fifteen more lines (2.2.460, 462-76), ending with references to the “burning eyes of heaven, / And passion in the gods.” These lines are not the last lines of the poem because Hamlet tells the Player that he can continue the recitation at a later time. The reason why Shakespeare terminates the recitation precisely at this point is to announce for the first time that empirical evidence exists in support of the conjecture that the nebulous Milky Way is comprised of stars (Usher “Support” 141-2). Thus the demonstration of Hamlet’s literacy and his connection to the new cosmic realities of the last quarter of the sixteenth century that were wrought by astronomical telescoping, encourage examination of Hamlet’s letter from a cosmic allegorical standpoint.

When Hamlet addresses Ophelia as “celestial” (2.2.109), he sees her as a paragon of heavenly perfection, but also recognizes that her very name derives from the celestial alignments of Full or New Moon, since the coined name *Ophelia* refers to the alignments of Opposition and Conjunction (136). Thus Hamlet speaks of his alignment with Ophelia, which in the abstract world of allegory is that of Syzygy⁵ but which in real life would pass equivocally as “love.” The heir-apparent needs his cosmic alignments just as the false monarch needs his “Conjunction” with Gertrude, for “as the star moves not but in his sphere” so the King “could not but by her” (4.7.14-6).

Consider first the combination LL1,2+4. In L1, Hamlet advises Ophelia to doubt that the stars are fire. By the precepts of the New Philosophy, this is correct. In L2 he advises her to doubt that the Sun is in motion. Correct again! If “but” in L4 connotes a topical disconnection from LL1,2 and means *moreover* or *and* as discussed above, then Hamlet changes the subject and proclaims an affinity with Ophelia. This establishes the prospect that through the couple’s combined agency, unbounded heliocentricism can prevail at Elsinore if she chooses to team up with Hamlet, forsaking her father and the old worldview.

Hamlet's admonitions LL1,2 to doubt items that relate to the two basic tenets of bounded geocentricism are now no longer mere rhetorical hypotheticals as in the literal case (1) above. Instead they instruct Ophelia to heed the New Philosophy, and in the process perhaps also a new political hope for an end to tyranny. Hamlet does not stand on romantic niceties because the cold, hard facts of natural philosophy per se have nothing to do with emotion and do not respect feelings. In the abstract world of allegory, alignments of the heart play second fiddle to the alignment of heavenly bodies.

LL1,2 implicate the Copernican and Diggesian worldviews, suggesting that Ophelia consider changing her outlook and subscribe to the new model because by L4 Hamlet's destiny is aligned with Ophelia's as the Sun is aligned with the Full and New Moon. If they are to pull together, then Ophelia must prepare to help rule Elsinore just as in mythology the royal Sun and the chaste Moon rule the sky. Delightful as the prospect may seem, when the alignments are most nearly exact (i.e. more nearly perfect) either the Sun or the Moon can be in a state of total eclipse. It comes as no surprise, therefore, that in the end Hamlet and Ophelia are both eclipsed, Ophelia being "too much of water," followed by Hamlet who is "too much in the Sun." They are not eclipsed simultaneously just as eclipses of Sun and Moon do not occur at the same time. Ophelia's star, the Moon, rules Neptune's Empire, the oceans, whose high water marks at the time of eclipse are deepest, at which time those caught in the ebb and flow of events are most imperiled by drowning. Mythology further justifies the epithet *celestial* because to the ancient Greeks, Phoebus Apollo was god of the Sun, and Diana was goddess of chastity and of the Moon.

Hamlet represents the star that rules the planetary system, whereas Ophelia represents merely a satellite of a satellite of that star, and so moves in decidedly inferior circles. In the new organon, the Moon is the only ancient planet to retain a geocentric orbit, so the lunar Ophelia has no inherent reason to doubt that the Earth is the center of her orbit. But in stating the primacy of the Sun—that it does not move about the Earth but the other way around—Hamlet suggests her potentially new and unique role. She retains geocentricity in that she will forever be the progeny of a geocentric father, but her new orbit will expand her horizon and carry her around Hamlet's Sun.

Then in L3, Hamlet switches topics and suggests that she doubt that truth is a liar. As noted, there is a shift in topic from LL1,2 to L3, from matters celestial to a banality on verity and falsity. But now at least all three lines are similar to the extent that they all suggest that Ophelia doubt erroneous concepts, viz. (L1) that the stars are fire; (L2) that the Sun moves (around the Earth); and (L3) that truth is a liar.

Despite this modicum of parallelism, lines LL1,2 remain orthogonal to L3 to the extent that LL1,2 deal with a fairly advanced and esoteric subject (cosmology), whereas L3 is a trite and elementary observation on the nature of truth. A desire for parallelism is not absolute of course, but a sense of artistry suggests that: if LL1-3 are to be similar in their advocacy that Ophelia doubt erroneous matters, might not the matters in these three lines have something in common? What if the singular "truth" in L3 refers not to the abstract notion of the general state of "being-the-case," but rather to a particular truth, just as the singular "liar" might likely refer to a particular existent? Since the verse does not actually name the absent noun to which the attributes of a liar might pertain, a

myriad of possibilities exist. Under these circumstances it is unlikely that the Bard would fail to provide a clue to the meaning intended, but in the present context a good guess is that the preceding two lines LL1,2 serve to guide the interpretation of the next, L3. So the question is whether there is anything in the New Philosophy that relates specifically to a liar, and the answer is yes, there is.

According to the cosmic allegory, Thomas Digges's *A Perfit Description* is one of the Bard's chief sources for *Hamlet* and the first complete statement of the new cosmic worldview. As noted, therein Digges takes Aristotelianism to task, quoting the Stellified Poet, Palingenius, who had singled out Aristotle in his *Zodiacus Vitae* of 1531:

Whatsoever Aristotle saith, or any of them all,
I pass not for: since from the truth they many times do fall . . .
(Book VIII, 129-30; see e.g. Johnson & Larkey 101n2)

Palingenius specifically associates that philosopher's followers with lies:

What store of fond Foolosophers and such as hunt for praise
The earth brings forth, it is not good to credit all he says . . .
For famous men do oftentimes make great and famous lies,
And often men do miss the truth, though they be [e'er] so wise.
(Book XI, 513-4 & 517-8)

Digges assails Aristotle's lack of consideration of Pythagorean ideas, and the resulting air of infallibility that developed about his works, whereas Digges himself "consistently kept to the scientific point of view" (Johnson & Larkey 79-80, 101, 113). Thus if "liar" in L3 pertains to Aristotle's cosmology as the prior lines LL1,2 might suggest, then it is likely that Digges's treatise and the cosmic allegorical explanation come into play both in LL1,2 and L3.

In addition, the apparent truism L3 contains the words, *doubt*, *truth*, and (by implication) *falsity*, and these belong to the language of logical argument. In fact, the age-old matter of truth versus falsity is of major concern to Aristotle whose collected works on logic, *Organon*, constitute the logical grounds of his canon.

When Aristotle constructs his worldview he ignores the possibility that the very essence of what we today term the Copernican and Diggesian transformations might exist, so by neglecting them he imputes falsity to them. Whereupon his followers dutifully regard the missing possibilities as eminently unworthy of consideration. Thus it is hardly a stretch to let the topic of "truth" in L3 refer to Digges's beliefs concerning the two elements of Hamlet's transformation. So in L3 Hamlet instructs Ophelia to go against Aristotelian *belief* and *doubt* that the *truths* of Hamlet's transformation are false. In short, she is encouraged to see Aristotle as a liar for failing to entertain even the possibility of unbounded heliocentrism.⁶

The fact that Hamlet chooses to write L3 in such a complicated way suggests that the line is a parody on Aristotelian logic and methodology. The pious philosopher's chief instrument of logic

is the syllogism, and by ridiculing its axiomatic nature, Hamlet disparages the grounds of Aristotelian physical cosmology. In this Shakespeare follows Digges exactly: "There is no doubt, of a true ground truer effects may be produced than of principles that are false, and of true principles falsehood or absurdity cannot be inferred" (Johnson & Larkey 80), so it seems likely that the Bard would choose to write Hamlet's letter in such a way as to bring out the erroneous foundation of systems based purely on axiomatic truth and logical inference.

In a popular account of Aristotelian logic, Weaver writes that Aristotelian logic has the "absolutely devastating limitation" of allowing only two "truth values." These are: perfect truth, symbolized by the number 1, and absolute falsehood, symbolized by the number 0. A third, and embarrassingly large, category "contains all the statements that classical logic cannot handle at all," these being ones that are "neither completely true nor completely false," i.e. with truth values lying between 0 and 1 (27-38). A logical conclusion is worth just what the premises are worth, since logic cannot manufacture truth out of thin air, and in fact, in the vast majority of instances, there is never enough information to lead to a single, definite and certain conclusion. To this extent the suggestion that "doubt" in L3 could have the "weakened sense" of *suspect*, is pertinent.

In sum, it is hardly a stretch to believe that Hamlet encourages Ophelia to doubt the two basic elements of the old canonical worldview as well as the means by which that view is reached. All three lines LL1-3 are closely allied and parallel in meaning, with the added layer of significance that the assumptive and deductive arguments inherent in *Organon* and which form the grounds for Aristotelian physics and astronomy, are ridiculed into the bargain. Whereupon L4, being independent of the dry subjects of physical cosmology and logic, and with the sense above of "but" meaning *more-over* or *and*, establishes the independent fact that Hamlet has a special cosmic relationship with Ophelia. Since most problems of significance in the real world have truth values between 0 and 1, Shakespeare uses *doubt* repetitively instead of words more appropriate to the binary extremes, such as *deny* or *accept*, to demonstrate awareness of the complexity of problems in cosmology, epistemology, and the lives of humans, and in general of the open-endedness of inquiry in natural philosophy.

Right after he has completed writing the verse, Hamlet tells Ophelia that he is "ill at these numbers," and that he has not the "art to reckon his groans." Shakespeare implies that the word *ill* means *artlessness*, and this agrees with the meaning in OED (7a) of "unskilful" [sic] and "inexpert." The standard interpretation of the line in question then is that Hamlet acknowledges the artlessness of his writing and verse-making (Edwards 2.2.119n), in which case the words "these numbers" refer to the *quality* or *quantity* of the words and lines of Hamlet's letter and verse. Another possibility is that Hamlet is referring to the "stars" mentioned in L1, as the only plural noun antecedent to "these numbers," a possibility supported by textual evidence and previous results (Usher "Support"). L2 refers to the Copernican component of the New Philosophy, and L1 refers to the alleged "fire" of stars, but the verse contains no reference to the distribution or number of stars. Yet of course in the Diggesian model, stars would be rather plentiful in an Infinite Universe. In fact, to someone with access to a telescope, their sheer numbers would boggle the mind. A person whose mind is boggled is likely to emit a groan or two, but when it comes to estimating the number of stars in an Infinite Universe, no-one has a store of groans equal to that seemingly endless task. Moreover,

Digges is challenged by the number of stars in the Milky Way which we know from the Pyrrhus recitation are so numerous and crowded as to give the impression of nebulosity. Thus the sentence in question joins L1 and L2 in accounting for all cosmological aspects of the New Philosophy: viz. that the Sun is the center of the planetary system, that stars are like the Sun, and that they extend into space seemingly without end.

Finally, consider the odd way in which Hamlet concludes his letter (2.2.121-2). As noted, most agree that Hamlet's use of "machine" refers literally to his somatic being (OED 4c). But it is unclear to what particular "machine" the pronoun "this" refers. In principle, it could refer also to Ophelia's "frame," in which case Hamlet's ambiguous pronouncement of devotion "whilst this machine is to him" means that he pledges devotion to her for as long as she "is" [devoted] "to him." In fact, in 3.1, no sooner does Hamlet suspect her of dishonesty than he breaks off the relationship and advocates she get herself to a nunnery.

The OED invites readers to compare this narrow somatic meaning of "machine" in category 4c, with the leading and general meaning, OED 1, of which only two examples are from the sixteenth century, both in category 1a. In this definition a "machine" is "a structure of any kind, material or immaterial, a fabric, an erection." The later of the two examples narrows down the possibilities. It comprises line 38 of the 1599 hymn "Of Gods Benefits Bestowed upon Man" by the Scottish poet and churchman Alexander Hume (1557?-1609). Lines 37-8 of the hymn have to do with the creation of the universe as related in John 1.1:

Even be his wisdom, and his word, so wondrously of nought,
This machine round, this universe, this other world he wrought. (Lawson 18)

The next two lines of the hymn are the start of Hume's lengthier account of the Creation according to Genesis 1. The description is apt, since the Ptolemaic model with its rods and wheels resembles an intricate mechanical device. Thus, following Hume, Hamlet's "machine" could be the frame or structure of the universe, the sense in which it is used by Digges a quarter-century earlier (Johnson & Larkey 87-8): "In this form of Frame . . . we behold such a wonderful Symmetry of motions . . . the progressions and Retrogradations," great in Mars and least in Saturn, "but if it be referred to the orb of stars fixed, then hath it no proportion sensible" (i.e. there is no perceptible heliocentric parallax angle for the stars; see Usher "Allegory"). In scene 2.2, in which his letter is read, Hamlet refers to cosmic existents using architectural terms: "this goodly frame, the earth, . . . this . . . canopy the air," "this brave o'erhanging firmament," and "this majestic roof fretted with golden fire" (2.2.282-4).

We need to know how this cosmological meaning of "machine" relates to Hamlet's closing sentence. When Hamlet writes of the new model being "to him," he is speaking allegorically as if associating himself with corporeal or incorporeal cosmic properties. In effect, when Hamlet signs off, he announces that "there is a great deal" (the New Philosophy in fact) "to him." He says as much when, after his education at Wittenberg and his loss of political and cosmic innocence, courtesy of the Ghost, he implies that he knows of the New Philosophy when he tells Horatio that

there are more things in heaven and earth than are dreamt of in Horatio's philosophy (1.5.167). The association of "machine" and Hamlet is not hard to accept because by hypothesis, the two components of the New Philosophy which are Hamlet's transformation and which he personifies, are an integral part of him.

Next, according to the OED, "whilst" can mean "while" which in a transferred sense has various connotations, such as "provided that" or "as long as." This is exemplified by usage from 1597: "Neither boldness can make us presume as long as we are kept under the sense of our own wretchedness; nor, while [as long as] we trust in the mercy of God through Jesus Christ, fear be able to tyrannize over us." Altogether, Hamlet's closing sentence means, therefore, that he will remain faithful to Ophelia as long as she remains true to him, and as long as he is alive to personify the two chief components of the new worldview.⁷

Irony

Jenkins (2.2.116n) suggests that Hamlet speaks unknowingly of the New Philosophy in LL1,2 and so concludes that Hamlet's verse is ironical. Hitherto, critics have not known of the possibility of a cosmic allegory, and indeed from the standpoint of the present essay, Hamlet's letter would be ironical were he unaware that he is the agent of cosmic change. But Hamlet correctly interprets the resistance of Polonius and the King to his role as the harbinger of the New Philosophy, and by slyly burdening Ophelia with his letter he anticipates correctly that Polonius ultimately will lay hands on it, so he writes in order that Polonius be hung by the petard of his own scurrility.

Thus the greater irony is that Hamlet dupes Polonius into announcing to his geocentricist monarch the very worldview that is totally at odds with the prevailing doctrine at court. Hamlet's letter promotes the new worldview, and makes the bigoted advocates of bounded geocentrism look foolish. Irony brings opposing theories into direct conflict, as it does here. Irony has victims, who in this case are the King and Polonius.

In conclusion

The Bard uses the device of allegory in Hamlet to tell surreptitiously of the New Philosophy, but he supplies many textual clues to the hidden meaning of the play lest equivocation be his undoing and camouflage the cosmic sub-text too well. This article shows that Hamlet's love letter is another part of the play that has both a literal and a figurative meaning, first that Polonius is justified in believing that Hamlet is madly in love with his daughter, and second that Hamlet's letter is a parody of Aristotelianism and as such is further support for the cosmic allegorical interpretation of *Hamlet*. Through the agency of Hamlet's letter, Shakespeare continues the disparagement of Aristotelianism that Thomas Digges engages in *A Perfit Description*, as does Digges's favorite poet Palingenius in *Zodiacus Vitae*.⁸ Hamlet's letter is ironical insofar as Hamlet dupes Polonius into announcing the essential elements of the New Philosophy in the presence of the King who epitomizes its very antithesis, viz. the bounded geocentrism of his namesake, Claudius Ptolemy. — 🍷

Endnotes

¹ The “inward man” represents a transformation of the origin of coordinates ($r = 0$) from the center of the Earth to the center of the Sun, while the “th’exterior” man refers to the universe of stars. A recent interpretation (Usher “Support”) posits that Thomas Digges came by this model with the help of a primitive telescope, through which, seeing stars extending outward in all directions as far as his eye could descry, he makes a quasi-mathematical inductive leap and arrives at the concept of “infinite space” (2.2.244). This leads in effect to an outer boundary of limitless extent ($r = \infty$). Between these two boundaries lie virtually a limitless number of mysteries, of which the meaning of *Hamlet* is one.

² Editor’s note: It is possible that de Vere first made the acquaintance of Thomas Digges during their childhood while de Vere was living with his tutor, Sir Thomas Smith, since Smith’s wife, Philippa Wilford, was first cousin to Bridget Wilford, mother of Thomas Digges and wife of Leonard Digges, the primary source of his son’s scientific knowledge of mathematics, telescopes and stars. The great interest in astronomy and astrology shared by Smith and Leonard Digges, who were contemporaries, plus the family relationship between their wives, argue for the connection. In addition, Smith’s library list of 1566, the one available to Oxford throughout his childhood, contained all the important texts of the day on astronomy and astrology, including those of Ptolemy (the old worldview) and Copernicus (the new) (Strype 279-80). It is plausible therefore that up-to-date knowledge of the stars and the New Philosophy came to de Vere early in life via his tutor, Sir Thomas Smith, the husband of Smith’s wife’s cousin, Leonard Digges, and later on, their son, Sir Thomas Digges.

³ One presumes that Ophelia can understand these astronomical references. Many in Denmark, where the Lutheran Melanchthon (Philipp Schwarzerd 1494-1560) enjoyed a devoted following, would know of Luther’s ridicule of Copernicus in 1539 (Dreyer 177n3). Neither Protestants nor their Catholic brethren had a monopoly on rejection of the New Philosophy, however, so it is safe to conclude that, regardless of her religious affiliation, Ophelia would toe the line of religious conformity and understand through the celestial references that Hamlet is expressing his love as sincerely as any mortal can.

⁴ Jenkins (2.2.117n) notes also that *suspicion* in L3 would leave “the status of truth and hence of Hamlet’s love in some ambiguity,” but this suggestion is itself doubtful because Hamlet says explicitly in the nunnery scene (3.1.114): “I did love you once.” The truth of this admission seems plain enough, except that three lines later, Hamlet says what seems like the exact opposite: “I loved thee not.” Here, however, it seems likely that Shakespeare intends different meanings for the two usages of the verb *to love*. Consider that the noun “love” can refer either to states of solicitude, delight in presence, desire for approval, warm affection, or attachment,” or it can refer to the “animal instinct between the sexes and its gratification” (OED). Ophelia is Hamlet’s paramour, since from the fourteenth century, a paramour is “a person beloved of the opposite sex, a ‘love,’ a lover, a sweetheart . . .” (OED). The same distinction as occurs in the meaning of the verb *to love* occurs in the meaning of the noun *paramour*, as in usage from the middle of the sixteenth century: “His paramour she thought to be, Him for to love with heart and mind, Not in vice but in chastity.” It is reasonable that Hamlet’s apposite and seemingly contradictory statements about love signify this difference, because Hamlet and Ophelia are unwed and Hamlet loves her platonically and not sexually, and thus not in vice but in chastity. Thus Hamlet’s love for Ophelia is not in doubt, and so it is unlikely that the weakened sense of *suspect* obtains in L3.

⁵ Syzygy is the rough alignment of the Earth with the Sun and Moon, and so describes alignments corresponding to *Opposition* and *Conjunction*, and the phases of Full and New Moon.

⁶ For purposes of further clarification, note that there are three alternative ways to express the conclusion in this paragraph. Replacement of the words *doubt*, *truth* and *falsity* by their opposites, these being, for example, *acceptance*, *falsity* and *truth*, taken in mutually negating pairs, yields three other independent expressions for L3; these are that Ophelia should: doubt that falsity is truth; or accept that truth is truth; or accept that falsity is falsity. Further, in the special case here advanced, *truth* refers to the two components of Hamlet's transformation, and *falsity* to the antithetical Aristotelian assumptions of *bounded geocentricism*, so that substitution of each of *truth* or *falsity*, in turn, in the three equivalent expressions immediately above, yields six alternative expressions for the meaning of L3: that Ophelia should: doubt that falsity describes Hamlet's transformation, and that truth describes the antithetical Aristotelian assumptions; or she should accept that Hamlet's transformation is truth, and that truth describes Hamlet's transformation; or she should accept that the Aristotelian assumptions are false, and that falsity describes the Aristotelian assumptions.

⁷ Concerning the difficulty that the ingenue Ophelia might not grasp her new and potentially significant cosmic role (see Note 3), Hamlet cannot speak more plainly lest he reveal his revenge motive and so risk retaliation in the natural world. Until his primary figurative (cosmic allegorical) and literal (human political) goals are accomplished, the one thing that he must not lose is his life (2.2.210). As it is, he fears bad dreams when he thinks of himself as ruling Elsinore, and thus being, so-to-speak, cosmically the "king of infinite space" (2.2.243-4), so he is not about to abandon his riddling ways. If Ophelia does not see the deeper non-literal meanings, then the literal meaning of the letter is sufficient to alert her to the possibility of her role in political change at Elsinore.

⁸ Editors Note: While at Cecil House during his teen years, Oxford would have become acquainted with the poet Barnabe Googe (1540-1594), whose translation of the second half of Palengeniuss's *Zodiacus Vitae*, published in January of 1561, he dedicated to his patron William Cecil, later Lord Burghley (Kennedy 11). As Burghley's protégé, it's clear from his biographer's account of his life that Googe was a regular at Cecil House during the years that Oxford resided there. Thus Palengeniuss's references to the infinite heavens would have coincided with information acquired from Leonard and Thomas Digges.



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