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10

SHAKESPEARE AND CLASSICAL COSMOLOGY

Jean E. Feerick

Half a century after the death of Shakespeare, a truism of literary criticism appeared in the pages of John Dryden's *An Essay of Dramatick Poesie* (1668). In the dialogue, poet-critics convene to assess the merits and influences of English poetry as embodied by "moderns" like Shakespeare, Jonson, Beaumont, and Fletcher. Although Shakespeare is singled out for his "irregular" drama that fails to "perfectly observe" the laws of poetic form as codified by Aristotle and Horace, Shakespeare has an avid apologist in Neander, who argues that if Shakespeare is not quite as learned as Jonson or as "improv'd by study" as Beaumont, he nevertheless embodies the power of unmediated art (Vickers 137–38). For where the classics served as the guide for Shakespeare's cultivated peers, he, too, had a powerful mentor: being "naturally learn'd; he needed not the spectacles of Books to read Nature; he look'd inwards, and found her there" (ibid. 138).¹

Not constrained by precept and convention, Shakespeare emerges for Dryden as the poet who has absorbed nature directly: one who is proximate to nature partly because he is removed from the classics. In Dryden's Restoration world, the human artifacts of culture were increasingly regarded as distinct from and even opposed to the world of nature. Classical learning was a sign of artificiality, of a rupture from nature. In such a context, Shakespeare's limited learning—his "small Latine, and lesse Greeke," as Ben Jonson would have him remembered in a famous elegy—positioned Shakespeare for a subsequent generation of critics as the quintessential "poet of nature; the poet that holds up to his readers a faithful mirror of manners and of life" (Vickers 57).² The tradition of Shakespeare as the poet of *human* nature was thereby born.

But Dryden's cultural assumptions did not neatly align with those that were prevalent earlier, in Shakespeare's moment. For the Elizabethan and Jacobean, culture was not a "thing" possessed exclusively by people but an "action" performed on any aspect of the natural world—soil, plant, animal, or person.³ In fact Shakespeare had access to many classical texts, and they did not divide him from the world of nature but served to deepen his sense of nature as an all-encompassing force, pervading the cosmos no less than the world of people and their cultural "tools."

Against the view articulated by Dryden's Neander, I will suggest that the complex and multifaceted conception of nature in Shakespeare's drama was very much shaped by his classical learning. His "philosophy of nature" bears strong resemblance to ancient cosmology, especially in its pre-Socratic forms, which was newly accessible through humanist translations of classical texts and disseminated through Neoplatonic philosophy originating in Italy.⁴ Historians have

described the Elizabethan period as an era awash in such cosmological theories, due to new access to Plato's dialogues, a continued supply of Aristotelian texts that recorded pre-Socratic concepts, and a steady flow of syncretic interpretations of classical theories by Renaissance philosophers who styled themselves mystics, magi, and occult practitioners.

From Aristotle and medieval science, the Elizabethans inherited a view of the cosmos defined by a sharp division between the celestial and sublunary realms, which historians describe as a "two-sphere universe" (Hankins in Grafton and Siraisi 87). His theories postulated that material bodies of the sublunary world were "compounded of unstable mixtures of the elements" and thereby "subject to mutation and decay," while celestial bodies were "perfect and unchanging, composed of stable combinations of the four elements or, alternatively, of a fifth, heavenly element" known as the quintessence (MacDonald 176). In Aristotle's physical universe people were "bound by astrological cycles" (Ingegno in Schmitt and Skinner 237) and harbored a mortal soul, while the universe was understood as eternal. Such views collided with Christian doctrine, requiring considerable labor on the part of medieval theologians to reconcile the two traditions.

With the rediscovery and dissemination of Plato's writings, Aristotle's long-standing view of the cosmos came under attack.⁵ Inspired by the potential for Platonic philosophy to fuse seamlessly with Christian teaching, the fifteenth- and sixteenth-century Italian Neoplatonists—including Ficino, Pico, Agrippa, and Bruno—propounded theories of an animistic world, an infinite universe, and an *anima mundi* (world soul) that conjoined all living bodies into a harmoniously ordered cosmic whole.⁶ Building on the Pythagorean doctrine of the cosmos as a "living being with soul and intelligence" (quoted in Borlik 56), as recorded in Plato's *Timaeus*, their theories reduced "the gulf between the supralunary and sublunary realms" by envisioning a "*spiritus* of celestial origin . . . diffused throughout nature." It followed that the elemental motions occurring in the terrestrial and celestial spheres were not fundamentally distinct but rather were continuous with man's soul, serving as the "bond between the two worlds." Under certain conditions, they argued, man possessed the ability to "attain supracosmic levels," allowing him "to command the elements and to prophesy" (Ingegno in Schmitt and Skinner 238).

Indeed, the magus was, for them, the quintessential natural philosopher. In *De vita coelitus comparanda*, Ficino argued that the magus could unite "earthly and heavenly wisdom by mastering natural and spiritual magic" (MacDonald 182–83). Agrippa's *De occulta philosophia* built on these views, identifying the magi's quest to discover the secrets of the cosmic order as the "perfection of natural philosophy" (ibid. 183). If Ficino's account of the cosmic spheres as elementally continuous issued a blow to Aristotle's conception of the universe, Giordano Bruno pushed still further, viewing the very distinction between supra- and sublunary realms as meaningless, since all elemental processes were identical in the myriad solar systems that constituted a universe now conceived as infinite.

If the "old cosmology" of the pre-Socratics influenced Neoplatonic theories of animism, such ancient philosophies also shaped the views of figures we now associate with the period's "new science." These men, too, launched radical attacks on the Aristotelian tradition "under the banner of Plato and the pre-Socratics" (MacDonald 178). Copernicus's theory that the earth revolved around the sun, for instance, expanded an insight attributed to Pythagoras (179). His account of a heliocentric universe would first appear in published form in England alongside an essay on the ancient doctrine of the Pythagoreans written by Thomas Digges, who was brought up by the great Elizabethan scientist and mage, John Dee. Similarly, Gilbert's work on magnetism—first published in 1600—built on ancient mysticism in understanding magnetism as an "animistic force that permeates the universe" (MacDonald 179).⁷

Shakespeare's cosmic dramas

Like his contemporaries, Shakespeare's imagination was fired by access to these cosmological theories, even as his plays suggest, on the surface, his unfamiliarity with or indifference to the classical figures who authored them. Although occurrences of the singular noun *nature* abound in the plays and sonnets—running to 364 references—allusions to the classical philosophers most associated with physics and cosmology are thinly scattered across the corpus and receive short shrift. Aristotle's name appears only twice in the corpus—invoked once by Tranio in *The Taming of the Shrew* as an emblem of privation associated with “stoics,” “stocks,” and “checks” (1.1. 31–32), and once connoting the labors of logic, rhetoric, mathematics, and metaphysics in juxtaposition with the pleasures of Ovid's “sweet philosophy” (1.1.28).

Socrates' name appears just once, again in *The Taming of the Shrew*, where it is called upon to evoke not his learning but his allegedly shrewish wife. Plato's name is altogether absent from the corpus. Even general references to the broad category of *philosopher* appear just ten times in the plays. Only once, in *As You Like It*, is the word accompanied by the adjective *natural*, in a parodic nod by Touchstone to Clorin's “uncleanly” country manners (3.2.43). Practitioners of the physical world and the nuances of their respective cosmologies would appear to be all but erased by the contours of Shakespeare's imaginary universe.

Only the pre-Socratic philosopher Pythagoras—who delivers a culminating, 400-line oration in Ovid's *Metamorphoses*—evokes anything like a genuine philosophy of nature in the plays. Each of the four references to him allude either to his famous theory of metempsychosis, which described the soul's transmigration across embodied forms, or to his equally famous strictures against the eating of meat. So, upon finding Orlando's egregious love lyrics, Rosalind comically jests, “I was never so berhymed since Pythagoras' time that I was an Irish rat” (3.2.162–63). And more ominously, *The Merchant of Venice*'s Graziano finds justification for his racist view of Shylock in Pythagoras's theory “That souls of animals infuse themselves / Into the trunks of men” (4.1.131–32). This theory, he opines, explains how Shylock has come to possess the “wolvish, bloody, starved, and ravenous” attributes of his bestial alter-ego (4.1.136–37).⁸

But Shakespeare's reticence with regard to ancient sources does not reflect the considerable depth of knowledge he absorbed from these prevalent cosmological traditions. Not handling them systematically—as a philosopher would—he instead weaves them into the fabric of his plays, using them to elaborate character or context, often pitting one tradition against another for dramatic effect. In *The Merchant of Venice*, for instance, Lorenzo eloquently crystallizes a Pythagorean-infused view of the cosmos in praising the “sweet harmony” (5.1.56) of the celestial spheres. Gazing at the skies, he shares his vision of divine order with Jessica:

Look how the floor of heaven
Is thick inlaid with patens of bright gold.
There's not the smallest orb which thou behold'st
But in his motion like an angel sings,
Still choiring to the young-eyed cherubins.
Such harmony is in immortal souls,
But whilst this muddy vesture of decay
Doth grossly close it in, we cannot hear it.

(5.1.57–64)⁹

From Pythagoras via Plato, Cicero, St. Paul, Boethius and Ficino, Shakespeare receives this “doctrine of divine harmony” and imparts it to his young lovers, who perceive their affection for

each other as a distant echo of the sphere's "concord of sweet sounds" (5.1.83; see Danson 184). Their "immortal souls" participate in the heavenly music, even while their access to its wonders is blocked by the discordant effects of their material bodies. Strands of Platonic doctrine thus collide with Aristotelian notions of an essential divide between celestial orb and embodied man.

Hamlet revisits Lorenzo's vision in conversation with Guildenstern, puzzling over his inability to access the wonders of "[t]his most excellent canopy the air, look you, this brave o'erhanging, this majestical roof fretted with golden fire" (2.2.290-92). Though informed of its wondrous structure, he yet perceives only its degraded material form as a "foul and pestilent congregation of vapours" (2.2.293). Man's presumably eminent status among creatures—"the paragon of animals"—is also evacuated of wonder in the eyes of the dispossessed prince, evidencing man's earthly identity, his condition of being a mere "quintessence of dust" (2.2.297-98).

Such moments from *The Merchant of Venice* and *Hamlet* exemplify the countless references to cosmological motifs that pervade Shakespeare's corpus, expressing more than cursory acquaintance with the ancient theories revolutionizing the sciences of his day. As a poet, Shakespeare submits such theories to scrutiny, contestation, and destabilization, transforming philosophical truisms into the threads of powerful dramatic exchanges.

That a scientific sensibility infuses the plays has been registered in a growing field of criticism on early modern theories of embodiment, particularly Galenic humoralism, which has underlined the extremely soft boundary between person and world that prevailed during the Renaissance. Fully in step with classical theories emphasizing correspondence and continuity between microcosm and macrocosm, these popular medical theories portrayed the human body as a mini-cosmos, composed of humors expressing elemental combinations and permeated by variable weather systems in the form of passions. As Gail Paster has argued, humoralism creates a "form of consciousness that is open, penetrable, fluid, and extended outwards," not sealed off from or "opposed to the world outside" (in Paster et al. 116).¹⁰

The "human subject" that these critical approaches locate in the plays is a fully dispersed one, and owes his/her appetites, drives, desires, thoughts, and speech to the elemental world—a human effect, as it were, of cosmic forces much greater than those possessed by him/her alone. Indeed, classical natural philosophies viewed everything in the cosmos, from the highest angel to the lowliest worm, as composed of the four elements. The qualities of the elements—hot, cold, dry, and wet—infused the "real properties of all matter, animate and inanimate alike," transforming the human body into a "dynamic entity of intensities and flows" (Paster in Paster et al. 117, 123).

We can see Titus retrieving these elemental continuities when he imagines his fatherly bond to Lavinia as a powerful, yet intimate, expression of cosmological activities:

I am the sea. Hark how her sighs doth blow.
She is the weeping welkin, I the earth.
Then must my sea be moved with her sighs,
Then must my earth with her continual tears
Become a deluge overflowed and drowned . . .
(3.1.224-28)

Father and daughter here forge a microcosmic order, bound elementally by the water of tears, the air of sighs, and the earthiness of flesh that flow between them. Similarly, Lear's betrayal at the hands of his daughters registers as a violent cosmological event, a tempest that rages in the hemisphere no less than in the mental sphere of "his little world of man" (3.1.10). He defers, "I tax not you, you elements, with unkindness . . . And yet I call you servile ministers," perceiving their "fretful" (3.1.4) and "conflicting" (3.1.11) powers as the axis of his daughters' revolt. Indeed,

a powerful subtext of pre-Socratic cosmology insisted that such conflict—which Pythagoras's student Empedocles named elemental strife—was as much a part of the cosmological dance as was harmony.¹¹

Ovid's elemental poetics

Shakespeare's access to these rich philosophical traditions arrived not through a university curriculum rooted in Aristotle or Plato but, ironically, through his grammar school primer. Such texts as Erasmus's *De copia*, which schooled young readers in the art of eloquence, quoted widely from the Latin poet with whom Shakespeare would forever be associated—Ovidius Naso. Like all Elizabethan schoolboys, Shakespeare first learned Latin by reading Ovidian poetry. And I would suggest that it was in Ovid that Shakespeare discovered the cosmological poetics, with an emphasis on the mutability and homology of all living forms, that would exert a profound influence on his imagination throughout his life.

Indeed, from Shakespeare's childhood days at the King's New School in Stratford-upon-Avon, exercises in double translation and imitation imprinted the vivid contours of Ovid's language on his mind. As Jonathan Bate has observed, "lessons in poetry were lessons in imitating Ovid," whose epic served as the schoolboy's foremost textbook, folding poetry, rhetoric, history, and natural philosophy into one (Bate 22).¹² As R. R. Bolgar has observed, educated men like Shakespeare might be said to have "lived in two distinct, if overlapping, intellectual worlds," oscillating between their contemporary world and the world of antiquity, which became larger than life through the myths that lent color and drama to the classical past (quoted in Lyne 2001: 15–16). That Shakespeare was hardly alone in being inspired by Ovid's imaginary is evident in the major translations of the *Metamorphoses* by Arthur Golding and George Sandys that appeared in 1567 and 1632, respectively, framing the most active years of dramatic production in Renaissance England.¹³

Dramatic and nondramatic poets like Marlowe, Jonson, Spenser, and Drayton imitated, adapted, and echoed Ovid's poetry (Bate; Lyne 2001). But it was Shakespeare whom contemporaries most identified with Ovid, even casting him as the reincarnated soul of the long-deceased Ovid. Francis Meres posited this connection almost literally: "As the soule of Euphorbus was thought to live in Pythagoras: so the sweete wittie soule of Ovid lives in mellifluous and hony-tongued Shakespeare, witness his *Venus and Adonis*, his *Lucrece*, his sugred *Sonnets*" (317). In imagining a poetical soul migrating from poet to poet, Meres was imitating a classical pattern that had led the Roman poet of epic, Ennius, to imagine his own soul to be infused by that of the Greek Homer (Hardie 210–11).

Writers like Meres linked Shakespeare with Ovid through a gustatory vocabulary that attributed to each a sensuous, bodily, flowing, and erotic style, which they described as "mellifluous" and "sweete" like "hony." Indeed, modern critics have little doubt that Shakespeare's favorite poet was Ovid: Bate, estimating that no less than 90% of his mythological references derive from Ovid (23), argues that Ovid served Shakespeare not only as a "source of inspiration" but as his "guarantor of high cultural status, his way of rising above the 'vulgus'" (2). In the opinion of Charles and Michelle Martindale, a whole chapter of English literary history would vanish from the canon but for the humanist emphasis on the Latin poet: "Without Ovid, Shakespeare's plays (and English literature generally) would have been very different, and greatly impoverished" (90).

Humanist theories of education located the value of reading classical authors like Ovid partly in the belief that doing so would forge "worthy public servants" through rhetorical exercises that equipped the young men to develop skills as orators and stylists (Bate 32–33; Bushnell). However, they also emphasized the moral wisdom to be gleaned from classical history and mythology.

Golding illustrates this tradition in the verse to Leicester that frames his 1567 edition, providing biblical parallels to events that Ovid narrates from creation down through the four ages, as well as moralizations to tame the myths' erotic and illicit energies.¹⁴

But Ovid's text provided more than a handbook of style and moral wisdom for the school-boy. It offered, both in form and content, a lively and palpable grid of the workings of the universe—even a compendium of Greek cosmological theories. Golding captures this central aspect of the poem in his epistle when he notes:

For whatsoever hath been writ of ancient time in Greek
By sundry men dispersedly, and in the Latin eke,
Of this same dark philosophy of turnèd shapes, the same
Hath Ovid into one whole mass in this book brought in frame.
(*Golding Epil. 5–8*)¹⁵

In speaking of the "dark philosophy" of "turnèd shapes"—which he later describes as "the wonderful exchange / Of gods, men, beasts and elements to sundry shapes right strange" (Epil. 13–14)—that Ovid borrows from the Greeks and yet moulds anew into "one whole mass," Golding underscores a reading of Ovidian metamorphosis as first and foremost a cosmological event (Myers 54).

Accordingly, the "four kinds of things,"—in other words theses—that Golding identifies as being crucial to Ovid's poetry all form part of a cosmological reading of the epic. First, "nothing under heaven doth aye in steadfast state remain" (Epil. 9–10). Second, "nothing perisheth, but that each substance takes / Another shape" through a sequence of elemental "turns" (Epil. 11–12, 16). Third, "the soul of man [is] from dying to be free" (Epil. 17). And "finally," "not all / That bear the name of men . . . Are for to be accounted men" (Epil. 55–59). In Golding's understanding, the first three messages fall under the rubric of "natural philosophy" (Epil. 63). Although Ovid makes mention of such ideas "dispersedly" (Epil. 22) throughout his poem, they are the particular focus of the final book. When Pythagoras steps into Ovid's account of metamorphosis to provide a theory of the soul's wandering migrations through embodied forms, his oration serves to bring the restless and rapid narrative sequence to a close. This moment also symbolically transfers his philosophical knowledge from Greece to Rome, as he imparts his wisdom to Numa, the legendary second king of Rome (Hardie 206).¹⁶ Ovid's fourth subject—man's potential for beastly behavior—is described by Golding as the purview of "moral" (Epil. 64) philosophy, showing how broad the concept "philosophy" was for the sixteenth century: the principles of physical and moral life belonged together as objects of philosophical inquiry.

Golding was right to underscore the Greek origins of Ovid's "dark philosophy of turnèd shapes." From Greek philosophy, Ovid inherited a theory of elemental continuity among all living forms (Macauley 13–50). One of the earliest pre-Socratics to theorize these material connections was the Pythagorean disciple, Empedocles (Hardie 206), who first identified the four elements in writing as *rhizomata* or "roots of all." Viewing the elements as "united and separated by the forces of *philia* and *Neikos*, love and hate," Empedocles envisioned an "animate cosmos in which distinctions between things are graded, labile, mobile, and fluid" (Macauley 86, 116).¹⁷ A century later Plato would name these cosmological forces "elements," from the Greek word *stoicheion* or "letter," drawing attention to their status as the alphabet of "the great 'Book of Nature'"—even as he modified pre-Socratic theories in viewing these "letters" as secondary to a more prior realm of Forms (ibid. 109, 60).¹⁸ Subsequently, Aristotle, although inclined to critique both Plato and the pre-Socratics, yet affirmed that the sublunar world was composed of these ever-changing building blocks, making it a world of continual flux, as against the unchanging heavens, which he proposed

were composed of a fifth element—ether (Garber 28). Broadly considered, the elemental tradition in Greek philosophy offers a cosmology in which all living forms belong to a “broad community,” with none positioned “outside, above, or behind the phenomenal realm” (Macauley 120).

Such is the cosmology on display in Ovid’s epic, which enacts and embodies this elemental philosophy both explicitly and implicitly. In the opening book of Golding’s translation, a sequence of creations and un-creations serves as the pattern for the entire epic. The universe first appeared in its most fundamental form as a body composed of elements—fire, air, water, and earth—bound into chaotic relation by “strife” (1.20). Then a creator—whom Golding renders as the doubled agent of “God and nature” (1.20)—“did them bind / In endless friendship” (1.24–25), through motions described as “part[ing]” (1.21), “unfold[ing]” (1.23) and “sever[ing]” (1.23). Further acts of binding yield an ordered ball of earth and, finally, a human form, engendered, like the world, from the restless elements, both earth and water—but also, perhaps, from the “heavenly seed” (1.92) of more ethereal materials.

This first creation of man is not the last of its kind in the opening book. In a further creation of humankind, man grows from blood spilled on the earth after Jove strikes him down for threatening his godhead. In yet another creation story, stones soften into flesh at the hands of Deucalion and Pyrrha, following a deluge designed to purge man’s evil from the earth. In each case the affinity of humans with elemental and mineral substances is highlighted, and their kinship with the physical world emphasized.

Ovid’s first book is, in a way, a philosophical précis of the stories to come, in which individuals will be remade again and again. Humankind continues to be defined and propelled by a kind of “metamorphic geochemistry” (Barkan 30), whose patterns appear infinite in number and direction. So we see man’s elemental nature morphing him in the direction of the sky, as men become giants aspiring to godhead. And we see the converse when Lycaon hurls himself to the “ground with grovelling eye” (1.97), his “rage” (1.271) giving birth to the “ravening wolf” (1.276) within him, or when Daphne’s flight from Apollo lands her in the rooted posture of the laurel tree, her flesh transmogrified into bark and her hair into leaves (1.669–76). Finally, we see the process start all over again: Io, following her sojourn as a “goodly heifer” (1.756), resumes her “native shape” (1.924), relearning the mechanics of human speech after years spent “[l]owing” like a cow (1.936).

Ovid thrusts his readers into a natural world infused by elemental passions, laws, and drives. Rivers impart “justice to the waves” (1.710), reeds issue mournful noises (1.882), and the gods transmogrify “into flames” (1.598) of desire, presumably vulnerable to the fiery element of their celestial abode. If Ovid’s is a fantastical, mythological world, it is also a philosophical *poesis* that “[bridges] all the orders of creation by understanding heaven and earth, animate and inanimate beings, physical laws, and human emotions through a series of parallel explanations” (Barkan 27).¹⁹

In his epistle, Golding reveals some of the implications of this cosmology when he traces the dynamic borrowings and “mysterious contagions” (Barkan 27) that ripple through the universe, imagining a web of interlinked agents conjoined by acts such as respiration:

I grant that when our breath doth from our bodies go away,
It doth eftsoons return to air; and of that air there may
Both bird and beast participate, and we of theirs likewise.
For while we live [. . .]
Both they and we draw all one breath.

(*Epil.* 45–49)

Ovid understands human and nonhuman beings as “conspiring—literally, breathing together,” acknowledging the extent to which “nonhuman otherness [is] woven into the very elemental

conditions" of human existence (Macauley 26). His mythology builds on Pythagoras's philosophy, yet extends this web of "conspiracy" still further, suggesting that the very "universe respired"—its *pneuma* (life force) connoting "breath, wind, spirit, [and] mind" all at once (Borlik 35).

One implication of the community of breath in Ovid's epic is that "poetry becomes an adjunct to cosmology" (Heninger 6), its language a privileged participant in the elemental exchanges governing physical bodies. Far from being artificial, removed, or severed from the cosmos, human language—which transmutes air into breath and sound—is seen as tapping into the *pneuma* of the universe. For this reason Ovidian etymologies allow language to reveal a truth about the natural world, just as through his "transgressive wordplay"—wherein "semantic boundaries" dissolve into outrageous puns or where figurative meanings morph into literal ones—we witness a linguistic and conceptual version of the epic's physical transformations (Tissol 12).

Something similar occurs at the level of narrative structure: Charles Segal has noted how the "narrative discontinuity" that is a touchstone of Ovidian style, as against the providential telos governing an epic like Virgil's *Aeneid*, "parallels the ever-shifting nature of the physical world" (quoted in Tissol 4). For Ovid, metamorphosis—"cuncta fluunt" (Miller 15.178)—is the rule that governs the world in all its elemental forms, visible even in the linguistic seams—the plot, syntax, and structure—of the poem.

To the extent that language is bound together with the physical world, expressing the same elemental patterns, Ovid's poem embodies a pre-Socratic epistemology, one that tolerates no "cleavages between the natural and cultural realms" (Macauley 2). Although relentlessly fixated on the physical laws and connections among animate and inanimate beings, Ovid's poem, like the philosophy of the Greek philosophers before him, should therefore not be mistaken for materialism "in the modern sense," since "their notion of 'matter' (*hyle*) was not separated from or divested of 'mind'" (Macauley 69, emphasis in the original). Those aspects of humanity that would seem to us to set the human apart from the nonhuman—such as language or thought—are for Ovid profoundly connected to the physical world, extensions of its patterns and materials, not ruptures from them.

Indeed Ovid's poet-philosophers are singled out for their ability to use breath—whether as speech or song—to direct the elemental forces of the cosmos. Often their utterance conditions a response from animate and inanimate auditors.²⁰ The breath of the poet's song and language, for both Ovid and the pre-Socratics, can tap into the "cosmic harmony" ordering the otherwise strife-filled elements. As Charles Segal has argued in a study of Orpheus, it can also "recreate" that order "in the shaped, human terms of art" (quoted in Simonds 63).

In a favorite anecdote about Pythagoras that circulated in Renaissance texts, Pythagoras's strengths as a sage or philosopher—and it is significant that he was credited with being the first to use the word *philosopher* or "lover of wisdom" to describe himself—were emblemized in a stunning speech-act on his part. According to the story related in Thomas Cooper's entry for "Pythagoras" in Elyot's *Bibliotheca Eliotae* (1545), one night in the city of Tarentum the philosopher noted an ox eating and treading on a farmer's crops and told the herdsman to tell the ox "he shulde absteyn frome grayne." After being mocked by the herdsman, who retorted that "he never lerned to speake as an oxe," Pythagoras was invited to do so himself. Cooper narrates, "Forthwith Pythagoras went to the oxe, and laying his mouthe to his eare, whispred some thyng of his art. A mervaylous thing, the oxe as yf he had ben taught, left eatynge of the corne, nor ever after touched any, but many yeres after mildely walked in the citie" (Ee 6-E^{6v}, quoted in Heninger 26). The philosopher's breath thereby effects a reorientation of the beast's appetite.

In the *Metamorphoses*, the "Thracian poet" Orpheus (10.11) enacts similarly wondrous responses with the song of his harp.²¹ Traveling to the underworld to retrieve his prematurely dead wife, Eurydice, Orpheus tells a tale that makes "the bloodless ghosts shed tears" (10.43),

stirring passions produced by physical properties more fundamental than blood. "Then first of all (so fame for truth hath gone) / The Furies, being stricken there with pity at his song, / Did weep" (10.48–50). After returning to earth an altered man, Orpheus sits in an open pasture and "touched his tunèd strings" (10. 96). His music effects a veritable act of creation, as trees of every variety "thither came" (10.105), yielding forests and orchards animated by passions like "[delight]" (10.102) and by the spirits of transformed humans. Mastering his art after finding that the many strings make "one harmony" (10.152), Orpheus transitions from his "graver verse" (10.155) to a "milder style to tell of pretty boys / That were the darlings of the gods, and of unlawful joys / That burnèd in the breasts of girls" (10.157–59), thereby fusing his song with that of the poet who authors the mythological compendium enclosing it.

His song extends to the end of Book 10, when the disordered voices of the Ciconian women, enraged that Orpheus's grief has led him to "disdain" them (11.7–8), intervene to silence him. Their assault begins with objects—a lance and stone—weapons which continue to be "appeased" by the "sweetness of his song" (11.15–16) and are "vanquished with his sweet / And most melodious harmony" (11.11–12). But when the women stir the air with noises—"blowing shawms and beating drums and bedlam howling out" (11.17)—the harmony of Orpheus's breath-air is drowned out and their disharmonic chaos overtakes him. Dismembered by their violence, his voice yet echoes in the respiring forces that surround him: stones "did mourn" (11.47), beasts yield "sighing howls" (11.46), trees "cast their leafy hair" (11.49), rivers surge with tears, and even his "lifeless tongue" (11.55) murmurs a "lamentable noise" (11.56) which is echoed by the banks of the river down which it is carried. The story captures the physical powers and continuing sway of the poet's harmonious air-sounds, which migrate into the natural seams of the universe in the form of lingering respirations once the poet ceases to exist in human form.

The tangled web of nature in *The Tempest*

The Greek elemental philosophy that served as the building block of Ovid's metamorphic poetry also infused Shakespeare's conception of nature, both in the sonnets, which meditate recursively on the transforming effects of time and the power of poetry to arrest its sweep, and also in the plays.

The plays bear an Ovidian imprint in their understanding of humankind as extending and enveloping a lively, animate world: one that often seems rather human in its passions and drives.²² At the start of his career, for instance, Shakespeare's Titus comes to perceive not rigid divisions between human and nonhuman nature but a tangled web of agents and properties. There is a continuum in which men can be "more hard than stones" (3.1.44), just as the tribunes are in being deaf to Titus's pleas. Stones, for their part, can appear "soft as wax," as when they "receive" Titus's tears and seem "to weep" with him.²³

Midway through his career, Shakespeare made perhaps his most overt engagement with Ovid's cosmology. In *A Midsummer Night's Dream*, Bottom envisions translating himself through the medium of theater—but he comes to experience such movement literally, assuming the head and altered appetite of an ass. Similarly, the play's young lovers escape to the woods where they become "woody," encountering as readily as Ovid's gods the contagious effects of a desire traceable to a flower that has itself been "[purpled] with love's wound" (2.1.167).²⁴ Here and elsewhere Shakespeare stages the effects of elemental crossings, as the shared properties of the elements which crisscross all life-forms confound discrete categories like human, animal, plant, and mineral.²⁵ Agency, liveliness, and desire animate elemental forces that are universally present, serving as the letters that spell the cosmos and all who derive from it and reside in it.

But it is to the end of Shakespeare's career that I will now turn, to demonstrate the depth of the classical cosmology he absorbed from Ovid. In *The Tempest*, Ovid's cosmology ceases to be

something that Shakespeare, as a poet, wields playfully and metaphorically as a tool for understanding the world. Instead it comes to be acknowledged as the very condition of *poesis*. For the insight that the poet is a philosopher of nature, whose words "tune" and are "attuned to" the airs of the cosmos, lies at the heart of Shakespeare's most self-reflective drama.²⁶

In his study of the *Metamorphoses* the classical scholar Garth Tissol tellingly observes that Ovid's epic is a "creation story from beginning to end" (191). It portrays human, animal, plant, and mineral forms—not to mention linguistic, cultural, and social ones—emerging and dissolving in a continual sequence of elemental comings and goings. It is not difficult to map *The Tempest* along a similar kind of conceptual grid: featuring an exiled king washed up on an unknown, enchanted island with his infant daughter, *The Tempest* is nothing if not a creation story, the site of new beginnings for any number of characters.

For Prospero, the island affords the opportunity to rule anew, a chance to recreate the Milan he has failed to govern. For Miranda, who greets the newcomers to the island with a resounding "brave new world" (5.1.183), the island is a place of education and maturation, where she transforms from infant to marriageable woman. For Caliban, whom Sycorax "did litter" (1.2.282) on the island, the island is the only home he has known—his native country. For Gonzalo, the island evokes reveries of a golden age, which he poetically recreates, even as he treads in the poetical footsteps of Montaigne. For the Italian noblemen, the island is where they grow strange to themselves—since "no man was his own" (5.1.213)—and, in one case, where passion's relenting flows yield transformation. Finally, to the Italian servants the island intimates autonomy—a release from indentured servitude to self-rule.

Change, alienation, transformation—these are the conceptual elements of *The Tempest*. Most of the characters suffer a sea-change—literally, metaphorically, and psychologically—imitating Bottom in *A Midsummer Night's Dream* in being disjoined from their former selves and remade into something new and strange. When Ariel invites Ferdinand to imagine this process literally—which is to say elementally—in wistfully singing of the "sea-change" (1.2.401) of his father's bones and eyes into stony coral and pearls, it is a process that many of the play's characters undergo in one way or another.

The Tempest pushes the metaphorical language of elemental crossings into its most literal expression. Shakespeare populates the play with characters who not only possess elemental qualities, but appear to personify the elements. Ariel epitomizes this pattern. A spirit whose name denotes his association with the "air," he has a power to shape-shift—one that links him to the poet, imagined by Theseus in *A Midsummer Night's Dream* as giving shape to "airy nothing" (5.1.15–16). Ariel performs these deeds literally. As "air," he infuses trees, flowers, sea, earth, minds, and bodies. He travels by means of wind, breath, song, speech, roars and other forms of "windy suspiration" (*Hamlet* 1.2.79).²⁷

Critics have traced Ariel's name to biblical passages, observing its connections to the word *altar* in the Geneva Bible, where the Hebrew word is defined in a gloss as "the Lyon of God." In this context, the word evokes disembodied speech. In chapter 29 of the Geneva Bible, Ariel is exhorted: "thou . . . shalt speak out of the ground . . . like him that hath a spirit of divination," and "[thou] shalt bee visited of the Lorde of hostes with thunder, and shaking, and a great noyse, a whirlwind, and a tempest, and a flame of devouring fire" (quoted in Johnson 206–7). Neoplatonic tradition defined airy spirits as "spiritual matter," viewing them as an "organic part of the universe" and an "administrant of natural processes" (ibid. 207). Robert Burton made these associations more precise in his "Digression of the Nature of Spirits," linking natural or sublunary spirits with the elements: "aerial spirits, are such as keep quarter most part in the aire, cause many tempests, thunder, and lightnings, tear Oakes . . . [make] strange noyses . . . and cause whirlwindes on a sudden, and tempestuous stormes" (quoted in ibid. 208–9).

Shakespeare's play features trees howling, the wind sighing, and logs tearfully weeping; Ariel emblemizes the elemental crossings that produce such effects. His airs stir the forces of wind and sea into a tempestuous storm, and invade the minds of the Italian aristocrats, infusing them with "fumes that mantle / Their clearer reason" (5.1.67–68)—except in the case of Ferdinand, for whom the "sweet air" is described as "Allaying" his passion's "fury" (1.2.393–94). Ariel's airs, along with those of his associates, invade Caliban's body so as to "rack" him with "old cramps" and make him "roar" (1.2.368–69). But for Prospero, Ariel would seem to be the "master" of the forces that envelop the island and all its inhabitants, the emblem of nature's all-encompassing power.

And yet it appears that a human figure, Prospero, controls Ariel's comings and goings, embodying an agency more powerful than nature and the elements. Does Prospero control the "*cuncta fluunt*" described by Ovid's Pythagoras? He might be seen to stand outside the system of elemental forces that the play dramatizes, an Orpheus or even a Pythagoras, whispering commands to nature to effect his political designs.²⁸ New historicist criticism has come to understand Prospero and his language of mastery as the epitome of culture, politics, and imperial power—the site, that is, of all those human activities that would seem to pull away from nature and, with the rise of empiricism, master it (Greenblatt). In such criticism, Prospero emerges as a kind of modern man, a natural philosopher who stands above and against nature.

However, I would argue that *The Tempest* is, perhaps, at its most elemental when it comes to Prospero. We misread the play when we perceive his language as inaugurating the "new" human dominion that will extirpate the natural.²⁹ On the contrary, just when Prospero is most mage-like, most philosophical, and most poetical, he is also most dependent—like Ariel, Caliban, Miranda, or the Italian courtiers—on forces greater than himself. His very use of books, of language, requires that he step fully into the laws and logics of elemental nature. It is this insight—that the poet is a philosopher bound to nature through his breath—that Shakespeare copies straight from his Ovidian textbook.

Prospero's past reads as a lesson in becoming more attuned to the airs of the cosmos, much as Ovid's Orpheus is portrayed at an early stage learning how to make the vibrating airs of his lyre achieve harmony (Simonds).³⁰ In the first act's expository account of Prospero and Miranda's journey to the island, the wind appears crucial to their survival. Prospero assigns credit for their safe arrival to a higher power—to "providence divine" (1.2.159)—but the wind functions as the agent and instrument of this power, allaying their grief by receiving and returning their pitiful cries. Prospero describes how they were caught in an elemental echo chamber that made them "cry to th' sea that roared to us" and "sigh / To th' winds, whose pity, sighing back again, / Did us but loving wrong" (1.2.149–51).³¹ Compared with the indifference to his plight expressed by his brother Antonio, the pitying winds that share in Prospero's grief seem to enable the flow of human lamentation that leads to healing. If Miranda has a substantial role in this process—since he identifies her as the figure who "did preserve me" (1.2.153)—the narrative he tells assigns a share of her agency to the windy breath that "[i]nfused" her "with a fortitude from heaven. . . which raised in [him] / An undergoing stomach to bear up / Against what should ensue" (154–58). In transmitting this stream of life-breath to her father, the infant Miranda gives him new life—in a remarkable reversal of normal gestational patterns whereby parent begets child.

The suffusing powers of the airy element, glimpsed in this reported episode, will be a defining mark of Prospero's activities. The opening scene of the play, in which he calls up a storm to ensnare his Italian enemies, replays the chronologically earlier moment in a darker key. While bringing the enemies to shore, the storm also begins the airy assault of Prospero's magic. Aboard the ship, mariners and passengers are subject to the "fire and cracks / Of sulphurous roaring" (1.2.203–4), which infuse them with rage and chaos: "A plague upon this howling!" (1.1.35–36).

The storm invades them, body and mind, stirring up social turmoil, as the Boatswain contests the Duke's power. It also wreaks havoc on the passions of the individuals, irrespective of rank. Their shrieks and cries echo the clamor of the winds, transmuting the airy element into human voice. Brought to the verge of despair, Ferdinand is the first to jump to what should be certain death, plagued by the overwhelming sense that "Hell is empty, / And all the devils are here" (1.2.214-15).

If the winds of the storm blow new passions into these men, so, too, it evokes a passionate response from Miranda, who views the ship's wreck from the shore. It is the wails of the men, rather than the roaring winds, that pierce her, "[knocking] / Against [her] very heart" (1.2.8-9). Although Prospero assures her that no one has been hurt—even diverting her attention with a gripping account of her princely identity—his words are a white noise to the mariners' wails, which she describes more than 100 lines later as "still . . . beating in my mind" (1.2.176).

Prospero's "magic" is indeed nothing more than a concerted attempt to tap the latent powers of the airy element: first, through his ability to marshal airy spirits (Ariel and his ministers); and second, through the management of his own breath and that of those he would rule. Here Shakespeare was indebted to the efflorescence of Neoplatonism in the sixteenth century. The Neapolitan natural philosopher and dramatist Giambattista della Porta, in his most famous work, *Magiae Naturalis* (1589; translated into English in 1658 as *Natural Magic*), described the natural philosopher as fully attuned to cosmological forces, described by followers as examining with "lynx-like eyes those things which manifest themselves, so that having observed them, he may zealously put them into operation" (quoted in Eamon 229). Such "books of secrets" imagined the magician as "a 'servant of nature' who coaxed, cajoled, and extracted from nature what nature could not produce unaided." As such, "the natural magician was like a superior artisan who possessed an intimate knowledge of materials and the forces acting upon them. Substituting philosophy for the artisan's cunning, he is able to do with nature what nature cannot do on its own" (ibid. 226, 217).

Tellingly, the frontispiece to the first English translation of della Porta's *Magiae Naturalis*, published in 1658, portrayed emblems of the four elements in each corner. At the top of the engraving was an image of "chaos," a cacophony of human, animal, and elemental bodies; at the bottom, an image of the author deep in contemplation beneath the sun's rays. Emblems of "art" and "nature" framed the title on the central lateral panels. Art, thus positioned on par with nature, was given visual space comparable to the four elements and located amid them. Here artist is embedded within the elements, his male artisanal hand a complement to the many breasts that define the emblem of female nature.

As someone who shares della Porta's love of nature's secrets, Prospero has learned to lend an open ear to the winds—that is, to the voices, sounds, and musical airs—piping around him. His attentiveness to the elements leads him to Ariel, trapped in a tree for twelve years after Sycorax's death. Tutored to heed the voices of the ambient world when lost at sea, Prospero, as a newcomer to the island, hears the groans that "Did make wolves howl, and penetrate the breasts / Of ever-angry bears" (1.2.288-89) and uses his art to release the "imprisoned" (l. 278) spirit. He reminds Ariel how he "didst vent thy groans, / As fast as mill-wheels strike" (ll. 280-81), a description that echoes Prospero's own posture of despair when trapped in a bark at sea and doomed to vent his sighs to the winds. With this act of liberation Prospero advances a step in securing his skills as a natural philosopher.

But Prospero's art is "airy" when it constricts as well as when it liberates the flow of breath or *pneuma*. We see this in his treatment of Miranda. First, he directs her to "ope thine ear" (1.2.37) to the verbal winds of his tale. He interrupts his narrative with questions that function as verbal winds that bombard her, demanding her attention: "dost thou attend me? (l. 78); "thou attend'st not!" (l. 87); Dost thou hear?" (l. 106). Then, when his tale is through and he wants her to be

no longer "open" to further knowledge of his and Ariel's airy design, he puts her to sleep with a "Wondrous heavy" (2.1.196) musical air or song. With such an air, Ariel will subsequently charm the Neapolitans; with such an air, Orpheus reportedly calmed wild beasts.

Just as he directs Ariel to use his airy ministers to besiege the ears, eyes, minds, and bodies of the Neapolitans, so Prospero practices a version of this technique on all with whom he comes in contact. His language is the counterpart to the voices, music, thunder, and other ear-invading activities that Ariel oversees. When Prospero first approaches Caliban's cave with derogatory and impassioned exclamations—"What ho, slave! Caliban! / Thou earth, thou, speak!" (1.2.313-14)—his visit would appear gratuitous. As Caliban indicates, his chores have already been completed. Arguably, Prospero's murky reference to "other business" (1.2.315) can mean only his desire that Caliban come out and be "pinched" (l. 328) by his words. To frame Ferdinand's beauty for Miranda by contrast with Caliban's vileness, Prospero must take the momentarily peaceful Caliban and incite him to rage.³² Prospero's language accomplishes this goal, replicating the powers of Ariel's spirits with a windy battery that torments the weary servant. Prospero's terms of address—"slave," "filth," "hag-seed," "malice"—serve as windy darts, eliciting from Caliban a storm of curses, among them "A south-west blow on ye" (1.2.323). This would be a more powerful form of the breath that Prospero uses to subjugate Caliban. Something similar can be observed in the manner in which Prospero tests Ferdinand, allowing a staccato-like language—"One word more" (1.2.453)—to trigger a seeming conflict between the men.

Of course, Caliban's decision to imitate the blustery Prospero only brings him tighter constriction later, when the pinch of words will be coupled with the pinch of flesh effected by stronger ministers: "Tonight thou shalt have cramps, / Side-stitches that shall pen thy breath up" (1.2.325-26). Later, Prospero takes a cue from Sycorax in threatening to "make thee roar, / That beasts shall tremble at thy din" (1.2.369-70). Prospero emulates Sycorax in seeking to control the flow of air and breath as the very mechanism of his rule.

Although Prospero's ability to release and restrict the breath of those on the island initially seems to identify a power that is unique to him, in fact the play shows rule as generally predicated on this dynamic. When Alonso believes that he has seen his son engulfed by the seas, Gonzalo, as counselor, offers him words to allay his grief. His effort resembles Ariel's use of a "sweet air" to allay Ferdinand's anguish when he believes himself the sole survivor of the shipwreck. Less effective than Ariel's airs, Gonzalo's words are repeatedly rejected by Alonso: "You cram these words into mine ears against / The stomach of my sense" (2.1.104-5). The implication is that rulers reserve for themselves the authority to sanction speech. Later Stephano will parody this view, lording it over his new "servant-monster" (3.2.3) by exhorting "I prithee now lead the way without any more talking" (2.2.167-68).

The Tempest shows rulers claiming to control air, breath, and wind as a vehicle of power—an ability that Prospero refines into a "potent art" (5.1.50). But if the rulers play upon others like so many wind instruments, so too are they played upon themselves by the elements that they seek to conjure. When Prospero pens Alonso in the magician's circle—an analogue of the tree penning Ariel or the cave penning Caliban—Prospero's airy kingdom has mastered him. Soon thereafter, he surrenders Milan to Prospero, expresses remorse for his treachery, and concedes to the union of Ferdinand and Miranda.

But Prospero is similarly infused by the elements he seeks to exploit, rather than simply mastering them from without. He, like Miranda, is repeatedly described as having a "beating mind" (4.1.163), interrupting his revels by observing: "Sir, I am vexed. / Bear with my weakness, my old brain is troubled" (ll. 158-59). When he hears Ariel's report of Caliban's advance on his cell, his troubled state erupts into a threat: "I will plague them all, / Even to roaring" (4.1.192-93). If here he diagnoses Caliban as having a mind that "cankers" with age (4.1.192), the same is true

of his own mental faculty, which betrays the stirred and confused state that Ariel's ministers have evoked in others. These final moments repeat the windy storm at the play's start, this time played out across the emotional registers of its aging rulers.

Prospero's passion, his quest for vengeance, is in the end allayed by little apart from air. It is Ariel who prods him in a different direction and models a gentler posture. Ariel's account of the Neapolitans—with liquid images of tears, sorrow, and “winter's drops” (5.1.16)—tempers Prospero's rigidity. By telling the magus that, were he human, his “affections / Would become tender” (ll. 18–19) in response to such sufferings, Ariel stirs him in a new direction. His act is crucial, emphasizing that all humans—servants, rulers, and natural philosophers alike—are subject to air, participating in the matrix of elemental infusions by which we mark and are marked by a surrounding world.

When Prospero remains onstage after the other characters have departed, he frames himself as a woeful spirit confined to the circle of the island. But Shakespeare extends the circle of participants in this elemental exchange to embrace us, the auditors, thereby framing the theater as nothing less than a miniature cosmos, one in which speech-acts are agents that effect dizzying exchanges between actor and audience, stage and world in the airy chamber of its globe.

Conclusion

As Dryden, echoing Jonson decades earlier, reminds us, Shakespeare did not benefit from a university education, whereby a curriculum in natural philosophy would have introduced him to Aristotle's theories of the physical universe as outlined in his *Physics*, *De anima*, and *De caelo* (Dear 107). Indeed, his plays often give voice to a profound skepticism about whether such philosophies would have benefited him had his education advanced further. Famously, Hamlet reproves university men for trusting too much in the powers of human wisdom to grasp cosmic secrets. As the young prince insists, “There are more things in heaven and earth, Horatio, / Than are dreamt of in your philosophy” (1.5.167–68).

In having the prince turn his back on the verities he and Horatio would have imbibed at the university in Wittenberg, Shakespeare was dramatizing a change that was well underway during his time. Aristotelianism—with its focus on universal causes, rather than on the particular properties governing natural objects—was being challenged from all sides, first by Neoplatonists like Ficino, Bruno, and Telesio, who insisted on an immaterial realm they argued was ontologically prior to the material world; then by Paracelsians, who emphasized the value of untutored experience and artisan knowledge; and later by Baconian empiricism and the atomism of Descartes and Gassendi, which paved the way for mechanical philosophy and the reorganization of the capacious humanist discipline of philosophy into the discrete enterprises “of physics and [that of] grounding physics,” otherwise known today as the disciplines of science and philosophy (Garber 68). In the words of Park and Daston, it was a period defined by “pell mell change at every level” (13).

Shakespeare's plays were animated by the epistemological transitions of the moment, the poet's distance from the axioms of a university curriculum even, perhaps, positioning him to be receptive to unorthodox views of the cosmos. His grammar school education, laden as it was with Ovidian poetics, introduced him to the pre-Socratic philosophy which would, paradoxically, serve as a major engine of philosophical change for his contemporaries. It was to them—to Pythagoras, but also to Plato and Democritus—that figures like Copernicus, Paracelsus, Gilbert, Kepler, and Newton turned for inspiration for their “new science,” wedging bigger and bigger holes in the Aristotelian philosophical system by returning to pre-Socratic visions of an infinite universe, animism, and a heliocentric solar system. It was Pythagoras who first coined the word *kosmos*, propounding a theory of the universe as a “contiguous, self-regulating system” that had great appeal for the practitioners of the new science (Borlik 34).

But what held equal appeal to Shakespeare was the pride of place that Pythagoras afforded the poet-philosopher in emphasizing *pneuma*—alternately defined as air, breath, wind, spirit, and mind—as the life-force of the cosmos. The divine artisan, in creating the world, engaged in an act of *poesis*, of making the universe by breathing life into it. As Heninger observes, in Plato's dialogue when Timaeus, "the astronomer from Pythagoras' Magna Graecia," describes the "creating deity . . . he refers to him with two epithets: 'the poet and father of this all'" (292). Echoing this act, Golding's Pythagoras delivers his culminating oration in "heavenly words" (15.75) that celebrate "earth as a living creature" (15.377), the harmony of his speech conveying the pulse of that cosmic body. So, too, throughout his career, Shakespeare explored the relations between human breath and cosmic *pneuma*. If in Titus and Lear he emphasized the seeming impotence of linguistic powers—both patriarchs making frenzied appeals to a sky that remains indifferent—in Prospero he came as close as he ever would to dramatizing Pythagoras's ideal of the poet-philosopher. For here he limned a figure whose language had the power to metamorphose minds and bodies, even while portraying that speaker as tossed, turned, agitated, and refined by the still greater airs of the animate cosmos.

Notes

- 1 For further discussion of this critical tradition, see de Grazia.
- 2 Jonson's quote appears in the elegy "To the Memory of My Beloved, the Author Mr William Shakespeare," which was first published in 1623 as part of the preface to the First Folio of Shakespeare's plays; for a modern edition, see Donaldson 453–55.
- 3 For an overview of the etymology of *culture*, see Williams. See also his discussion of the complex meanings of the word *nature*, which begins with a discussion of its iterations in *King Lear*.
- 4 For an overview of theories of cosmology in Shakespeare's day, see MacDonald.
- 5 Historians have argued that Renaissance philosophers continued to stand by Aristotle's views long after challenges from different quarters arrived. Mercer points out that 3,000–4,000 editions of Aristotle's work were published between the founding of the printing press and 1600 (39). Hankins notes that Plato's works had been ejected from the university curriculum in the first half of the thirteenth century, becoming the property of "lowly grammarians" and humanists, and only in the second half of the sixteenth century did the dialogues return to the university (88–89). For the view that "From top to bottom of literate society Aristotle was read," see also Schmitt 36.
- 6 For the history of mysticism and magic, see Walker. For Ficino's treatment of Platonic ideas, see Hankins. For the cosmology of Bruno, see Michel. For the history of the hermetic tradition, see Yates. For the Pythagorean tradition, see Kahn.
- 7 For a detailed discussion of this cosmology and its Pythagorean roots, see Heninger. See also the excellent encapsulation of Renaissance reception of Pythagoreanism, as distinct from Neoplatonism, in Borlik 24–74. See also the detailed history of Renaissance natural philosophy in essays by William A. Wallace, Alfonso Ingegno, and Brian P. Copenhaver in Schmitt and Skinner (201–300).
- 8 My discussion of Shakespeare's allusions to these classical philosophers is indebted to Bevington, although my emphasis differs, especially as regards the Pythagorean references, which he construes as little more than a "bizarre joke" (2). The other two references to the pre-Socratic philosopher appear in *Twelfth Night* in the exchange between Feste and Malvolio in act 4, scene 2 (ll. 44, 51).
- 9 All references to Shakespeare's plays, unless otherwise noted, are to the Norton Shakespeare 1997.
- 10 For more on humoralism and cosmology, see Paster; Schoenfeldt; Floyd-Wilson; and Floyd-Wilson and Sullivan.
- 11 For a discussion of Spenser's engagement with the paradox of elemental strife and concord, a philosophy transmitted by Empedocles to a poet like Homer, see Wolfe. Empedocles followed Pythagoras in viewing the elements as the "actual primary matter." He theorized that these "four elements, forming as they do pairs of opposites, were initially at war . . . with each other," a tension encapsulated by the phrase *discors Concordia* (Myers 41–42). Adhering to an Epicurean materialist physics, Lucretius would later attack this theory in *De Rerum Natura*, identifying the atom as the most primary form of matter. See Lucretius; see also Barbour.
- 12 Bate points out that the curriculum in Ovid was hardly limited to *The Metamorphoses*, with most grammar schools incorporating selections from *Fasti*, the *Heroides* and *Tristia* (21).

- 13 Although these two complete translations stand out for their popularity in the Renaissance—Golding's translation running through seven printings between 1575 and 1612—Bate discusses the many other extant translations of Ovidian texts by writers like Thomas Howell, Thomas Peend, George Tuberville, Thomas Underdowne, and Thomas Churchyard (30–31).
- 14 But Raphael Lyne has argued convincingly that the view of Golding's translation as a remnant of a "tired medieval moralizing tradition" may be misguided, observing the infrequency with which a "genuinely moralizing tone enters the narrative," as opposed to its framing documents (2001: 29–53, esp. 29).
- 15 Unless otherwise noted, all quotations of Ovid's *Metamorphoses* in English are from Golding's translation, since, as scholars have demonstrated through close lexical study, Shakespeare knew it well and consulted it widely. First published in complete form in 1567, Golding's translation enjoyed widespread popularity, being reprinted in the following years: 1575, 1584, 1587, 1593 (twice), 1603, and 1612. For the Latin text and English prose translations of it, I have consulted Miller.
- 16 Lyne refers to a growing uncertainty among critics regarding the tone of Pythagoras's speech—whether it should be read straight or ironically. But Hardie points out that seventeenth-century readers like Sandys and Dryden "thought that the Speech of Pythagoras was the high-point of the poem" (Lyne 2001: 25; Hardie 204). Lyne, too, observes that Golding "treats Pythagoras's speech as a genuine underpinning of the whole" poem (2001: 52).
- 17 Two fragments of Empedocles's writings survive as *On Nature* and *Purifications*. The former "is devoted in the main to natural philosophy, the claims of reason and the goals of nascent science, describing a cosmological process in which the universe is cyclically generated and destroyed," where the latter "attends more to religious matters" (Macauley 105).
- 18 For the view that Platonic philosophy, particularly the *Timaeus*, was rooted in Pythagorean doctrine, see Heninger 21–22. See also Kingsley's analysis of Empedocles and the Pythagorean tradition that seeks to undo the bias of accessing the pre-Socratics through the teleology of Aristotelian thought.
- 19 Myers emphasizes the extent to which epic and natural philosophy were overlapping modes of writing and inquiry for the Romans, observing: "From its beginning Roman epic not only dealt with Roman history, but also made cosmic claims" (10). Such a tendency built on a tradition that dates back to the pre-Socratics, as evidenced by the fact that Empedocles "deliberately chose to write not in prose but in the tradition of epic poetry," his natural philosophy intricately linked to poetic form (Kingsley 5).
- 20 For the related view that "speech underlines the entirety of the epic" and is "the principal catalyst of change," see Quartarone (68).
- 21 In the second book of *Fasti*, Ovid features another figure, Arion, whose powerful song evokes changes to the natural world, entrancing animals and stilling the running waters.
- 22 But see Borlik's compelling argument that anthropomorphism need not denote an exclusively anthropocentric understanding of nature and might express a view of "human subjectivity and well-being as inextricably linked with that of the non-human" (6–7).
- 23 For further explication of this play's ecological ethos, see Feerick.
- 24 For analysis of the play's ecological dimensions, particularly how the play points up "the way our illusory boundaries of selfhood are overrun . . . by entities much smaller and seemingly weaker than ourselves," see Watson (esp. 34).
- 25 For readings of Renaissance texts that foreground the porous nature of the boundaries that separate human life from animal, plant, and element, see Feerick and Nardizzi.
- 26 Critics have already noted *The Tempest's* close ties to Ovid. As Jonathan Bate observes, in Shakespeare's romances, the imprint of Ovid resurfaces after a period of relative submergence in the tragedies (215). So, too, Raphael Lyne suggests that the influence of Ovid reaches "a kind of climax and a kind of crisis" in *The Tempest* (2000: 150), and A. B. Taylor that "*The Tempest* with its world of changing shapes and forms has the strongest basic affinity with Ovid's poem" (1994/95: 19).
- 27 For an excellent discussion of the aural dimensions of *The Tempest*, see Neill.
- 28 Simonds develops these associations in arguing that "Prospero as a Jacobean Orpheus finds it necessary to use the negative persuasion of pinches and cramps as well as the positive charms of sweet harmony to temper the rebellious humors of such primitives as Caliban . . . and his drunken cohorts Stephano and Trinculo" (68).
- 29 For an analysis of the seventeenth century that blames natural philosophy and the rise of modern science for the degradation of the environment, see Merchant.
- 30 Brown interrogates the nature of Prospero's powers, noting: "At times he seems a beneficent, almost godlike figure, at others a cantankerous and forgetful old man; and, although more than natural forces

seem to be at work in the play, it is not always clear whether they stem from Prospero, the island itself, or some mysterious external agency" (6).

- 31 Quotations from *The Tempest* are to the Oxford Shakespeare edition prepared by Stephen Orgel (1987).
- 32 To this extent I propose that Prospero actively seeks to produce a vile and barbarous disposition in Caliban rather than to reform him, a view that gains credence at the end of the play when he confesses: "this thing of darkness I / Acknowledge mine" (5.1.275–76).

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