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Physical Theories of Motion in John Donne's *Holy Sonnets*

In the Aristotelian-Scholastic discourse, the concept of motion was a broad philosophical, moral and theological category, which was not restricted to the physical understanding of movement as change of spatial location but also encompassed such phenomena as maturing, dying, learning, and thinking (cf. Bostock, ch. 1: 1–19). Motion occupied the center of Thomas Aquinas's ethics and ontology: ontology because Aquinas derived the proof for the existence of God, the first Unmover Mover, from the efficient causality of motion, i.e. from the Aristotelian principle that whatever moves is moved by another; and ethics because he deduced the ethical goal of humanity, which moves towards its natural end, i.e. the attainment of salvation, from the Aristotelian teleology of motion (Oliver, ch. 4: 85–137). Although post-Galilean physics overthrew both the Aristotelian causality and purposefulness of motion (in Galileo's dynamics, mechanical causes were responsible for motion and rest, equally), the scholastic metaphysical significance of motion endured in seventeenth-century natural philosophy.

Aquinas presented the operations of sanctifying grace the Aristotelian theory of local motion and with echoes of the Platonic idea about the movement of the rational soul.¹ The ethical treatment of motion reappeared in *Institutes of the Christian Religion*, where Calvin so argued that will and understanding are the faculties essential to the predestinarian scheme: “[we shouldn't assume] that the mind has no motion in itself but is moved by choice” (194). It is a mistake, reasoned Calvin in a different passage, to compare the motions of man's soul to the projectile movement of a stone thrown in the air, for man can choose to “obey or resist that motion” (303). In the same chapter, stressing that election does not obliterate free will, Calvin compared grace to “an outside force” which affects “the motions of the heart” (308). “God by His power,” stated the theologian, “inspires in man

¹ In Aquinas's words: “the supreme bodies are moved locally by the spiritual substances; whence we see that the soul moves the body first and chiefly by a local motion.”

a movement by which he can act in accordance with the nature implanted in him” (ibid.). The heart of man who yields to carnal appetites is pulled away from God in a “perverse motion,” (301) while elective grace compels its movement in the correct direction. Those and other metaphors of motion pervade Calvin’s religious writings and, as I will demonstrate, the *Holy Sonnets* of John Donne.

In *Divine Poems*, Donne combines allusions to Aristotelian-Scholastic physics with references to Galilean mechanics. One of the areas of the New Science which captures the poet’s interest was the question of the reality and possibility of motion, lying at the heart of Zeno’s logical paradoxes,² which Donne refers to in theological verities. In “Hymn to God, the Father,” such a reference can be found in the line, “Will thou forgive that sinne; through which I runne, and do runne still: though still I do deplore?” wherein the pun on the word “still” (meaning both “continuously” and “without movement”) points to the Zenonian paradox of an arrow. A flying arrow, argues Zeno, cannot simultaneously occupy two segments of space, and it is motionless in every discontinuous point of its trajectory; therefore it always remains at rest. In Donne’s poem, the apparent impossibility of motion comes to represent the powerlessness of a sinner, whose innate depravation, like inertia, offers resistance to the momentum of faith.

Another typically Eleatic paradox appears in “Holy Sonnet VI”:

This is my play’s last scene; here heavens appoint
My pilgrimage’s last mile; and my race
Idly, yet quickly run, hath this last pace;
My span’s last inch, my minute’s latest point;

Comparing life as pilgrimage to a race towards death, Donne inscribes both into the Baroque trope of life as a flight towards the grave and into the Paulinian metaphor of an athletic race, an allusion to the race between Achilles and the tortoise. To win the race, Achilles must first traverse the interval separating him from the tortoise, who will meanwhile advance a small distance; consequently Achilles will run through an infinite sequence of gradually decreasing intervals, but he will never overtake his opponent. Donne’s race towards death also implies a repeated division of space into smaller and smaller units: “mile,” “pace” (0.001 miles, or 148 cm) “span” (0.15 paces, or 23 cm), “inch” (0.1 spans, or 2.5 cm), but the acquisition of consecutive termini does not yet permit him to reach the final limit. Roston (1976) describes this division *ad infinitum* in the sonnet as “elongation and compression of space and time,” (184) which leads to “a personal confrontation with death” (ibid.). What the critic fails to notice is that the meditative practice is modeled on algebraic geometry: Donne’s Christian pilgrimage to death conjures up not only the Archimedean theory of infinitesimals, but also the mathematics of a harmonic

² The Eleatic paralogisms reemerged in sixteenth-century scientific discourse, for example, in the arduous struggle of Renaissance mathematicians to solve the problem of the infinitesimals (Andersen and Bos 2006: 700).

series, a sequence approaching zero. Lastly, in the third line of "Holy Sonnet I," "I runne to death and death meets me as fast," there can be perceived a reference to Zeno's paralogism of the Stadium, which involves the consideration of chariots moving in opposite directions, and which elicits the conception of relativity of motion and speed. Davies (1996) reads this double race metaphor in a devotional context when stating that the poetic persona "sheers headlong against his will toward his enemy, who rushes to meet him as if charging backwards along the same line" (63).³

What role do paradoxes of motion play in Donne's penitential verses? Generally speaking, Zeno's paralogisms, relying on the divergence between scientific thought and observable experience (i.e. between the geometric idea of a line as an assemblage of dimensionless points and the physical actuality of motion along a straight line), call attention to the deceptive character of the material reality.⁴ Deploying, therefore, the Eleatic hypotheses in his sonnets, Donne gives a new turn to the Baroque concept of the perceptible world as a source of illusion. The essence of Zeno's argumentation is the proposition that all motion, including change from existence to non-existence, is illusory. In the *Holy Sonnets*, Donne meditates on the logical incongruities resulting from the geometrization of motion to explore the Christian paradox of life-in-death, thus discovering a continuity between mathematized kinematics and Christian metaphysics: death, like motion, is a contradiction in terms. In this way the description of the pilgrim's travel through the unfolding infinity of discrete points in the Euclidean manifold becomes both a metaphor for the dogma of salvation and a psychological device through which the poet delays the moment of death.

Disagreeing with Martz (1962), who sees *Holy Sonnets* as a spiritual exercise in *memento mori*, Bond (1983) believes that Donne's divine poems convey "the statement of how God's power overcomes death and of how that assurance affects the speaker" (26–27). In a way, Donne conquers mortality by the very means of the reference to Zenonian (and Galilean) mathematical description of motion – a metaphor which implies a de-ontologization of time and space surrounding the poetic persona. Rather than physical territory, the I-speaker seems to be traversing a geometrical system of disembodied spatiality and metrical time. Space, divided here into units of measurement (spans, inches, and miles), becomes described almost invariably through recourse to numerical magnitudes. Similarly, time becomes

³ Zeno's exposure of motion as a succession of stationary points also becomes an object of contemplation in Shakespeare. In *Winter's Tale*, this paradox underlies Florizel's wish to divide Perdita's movement into "singular [acts] in each particular" [Act. IV, Sc. IV, 166] and to arrest it in a series of motionless images ("move still, still so" [Act. IV, Sc. IV 164]). In Sonnet 104, in turn, Zenonian irreconcilability between sense perception and the geometry of time is applied to the contradictions of love as eternity in mutability: "So your sweet hue, which methinks still doth stand / hath motion, and mine eyes may be deceived" [9–10].

⁴ But also to the illusory nature of rational systems such as mathematics.

constituted by a point moving in a line (“my minute’s latest point”), which exists only in relation to other points: “terror” placed “behind” and death put “before.” Moving through such a Euclidian continuum, the pilgrim seems to dematerialize into a mathematical point which, remaining in the present, separates the distance between past and future and which, lacking extension, makes visible movement and place.⁵ Deprived in this way of physical extension, the “feeble flesh [which] wastes by sin in it,” the poetic persona anticipates the mode of existence to be attained in an eschatological setting. A seventeenth-century scientific view corresponding with Donne’s geometrical representation of motion is the mathematics of fluents, which are lines created by a continuous movement of a point.⁶ With the metaphor reducing the sinful body into an abstract value of a continuous function, Donne’s “fantasy of a material purification” (Strier 1989: 373) plays out in the space of mathematics.

The aforementioned allusion to Zeno’s paradoxes connects Donne’s metaphors to seventeenth-century mathematical investigation of motion. Also the very cosmological setting in which Donne’s drama of salvation takes place is not the Aristotelian-Scholastic universe of forms, but the modern, Stoic-Nominalist universe of forces.⁷ Moreover, unlike in medieval physics, these forces operate at cosmic distances without permanent contact with the moving body. Van Emden calls attention to the double syntactic distribution of the word “only” in “Holy Sonnet I”: “God alone is above” and “only God who is above” [can pull the human soul to heaven] (53). This ambiguous modifier underlines the position of God as the originator of all forces in the cosmos. Symbolic of the Calvinist notion of irresistible grace, the identification of God with an external force acting on passive matter is more consistent with post-Galilean mechanics than Aristotle’s physics wherein force is treated as an inherent quality of bodies and motion as an expression of their essential nature. Also the references to gravity and magnetism which are understood as dynamic processes linked with force and weight relate Donne’s imagery to early modern science. “Holy Sonnet I” dramatizes the battle for the sinner’s soul in terms of the natural laws of attraction and repulsion. It is external force – varying according to the mass of sins – that pushes man to hell (“feeble flesh doth waste / By sin in it, which it towards hell doth weigh”), producing gravitational acceleration downwards (“so fall my sins”) and it is also external force that pulls him upwards through a magnetic field (“And Thou like adamant draw mine iron heart”).

⁵ In “Holy Sonnet I,” Donne introduces the third dimension of space: the vertical line of God’s gaze. In a play on the theories of perspective and optics this verticality is proved indispensable for salvation. Unfortunately, the topic of optics and perspective goes beyond the limited scope of this article, so this area of interest will not be further explored.

⁶ Despite the efforts of Donne’s contemporaries to tackle the continuous function, the problem was not solved until Newton’s invention of the calculus which, still conceived in a metaphysical framework, allied the flowing motion of a point with the permanent supervision of God over natural law.

⁷ Such a distinction between the “old” and “new” models of the cosmos was made by Funkenstein (440).

Donne's image of God as a great adamant stone, whose directive power excites the magnetic susceptibility of man's iron heart, relies on the literary topoi of a heart which is hard as a rock ("You draw me," says Helena in *Midsummer Night's Dream*, "you hard-hearted adamant, but yet you draw not iron, for my heart is true as steel," [I, 1. 570]) and of a magnetic tie between two hearts ("my captured hart is bynd with adamant chayne," writes Spenser in "Sonnet XLII"). Donne combines these two meanings in the paradoxical metalepsis that Skulsky (1994) identifies in the closing line of the sonnet. "Things made of iron are hard, hard things are unyielding," Skulsky unveils the reasoning behind the conceit, "and in the dialect of Donne's language community, to be hardhearted is to be naturally resistant to the love of God" (114). At the same time, however, the iron steadfastness of the heart renders it more vulnerable to the attractive force of irresistible grace. Gardner (1952) believes that this double significance of iron in "Holy Sonnet I" exposes the pitfalls of the doctrine of elective grace, a problem which Donne also touches on in Sermons 7: 156 (75).

Donne's magnet metaphor is not only anchored in literary practices, but it also indicates the metaphysical interpretation of magnetic force in early modern natural philosophy. Even though the scientific narration of the sixteenth century reduced free fall and magnetic attraction to mechanical principles, the primary cause of these phenomena remained, for many philosophers, supernatural or at least unexplainable in physical terms. In Kepler's Neoplatonic model of the solar system, magnetic rays, caused by fibrous emanations of the Sun and identified with the souls of planets, account for the motions that organize the universe, so elliptical movements of the heavenly bodies and mutual attraction of planets are caused by the occult influences of the magnetic Sun (cf. Martens 2000). Similarly, William Gilbert understands magnetism as an "animate force [which] imitates a soul," (308) or "a light and spiritual effluvium" (368) which, sending forth its energy to objects separated by a distance, infuses the cosmos with rotational motions. In Gilbert's metaphysical cosmology, the Earth itself was envisioned as a giant spherical magnet. Thus, Donne's vision of God as an adamant stone exerting from above the firmament a gravitational force on his terrestrial heart might be patterned on scientific explanations of planetary attraction in such metaphysical-magnetic terms. As we can see, despite the prominence of the pre-modern, teleological view of nature in Donne's imagery (which will be the subject of analysis in the second part of this article), the motion metaphor in *Holy Sonnets* does not rest entirely upon a scientific relapse into medievalism. Modern physics with its mechanical concepts of gravity and magnetism provides Donne not only with the source domain for conceptual metaphors that represent the doctrines of Protestant theology, but it also supplies a metaphysical ground for these metaphors.

Zenonian paradoxes embedded in *Holy Sonnets* point to the Galilean recognition of motion as a geometrical process; nevertheless, Donne later reaches for the Aristotelian-Scholastic concept of teleological motion, not for Galilean mechanics

as a source of eschatological metaphors. The reason might be that the pre-Newtonian convictions about the final cause of movement agree more closely with the Christian idea of life as a continuous progression towards God than mechanical philosophy proclaiming that motion is not directed towards a purposeful end. Moreover, although participation in algebraically measurable motion anticipates the infinity of eschatological space, it does not fully liberate the poetic persona from the weight of sins and the tangibility of existence; in the moment of death he becomes suspended between these two realities. Thus, in *Holy Sonnets* the questions of soteriology are also translated into the language of pre-Galilean physics of matter and force, underlying the Aristotelian theory of teleological motion. Aristotle divides all terrestrial motion into natural and violent. According to the Stagirite and his commentators, all objects strive for their *telos*, their natural place of rest: upwards, under the influence of levity (in the case of light bodies), or downwards, under the influence of gravity (in the case of heavy bodies). Violent motion takes place when this natural, spontaneous mobility of objects is disrupted by an extrinsic force that operates on the body coercing its movement in the opposite direction (cf. Grant 1977: 130).

In “Holy Sonnet VI,” Donne imagines himself as an Aristotelian mixed body, that is a body composed of a heavy element (flesh) and a light element (soul). Because of the weight of sins which encumber the flesh, the heavy element prevails in man, determining his natural direction of movement as fall. But after death, which will “instantly unjoint” the body and soul, the simple substances, liberated from the compound body, will resume their natural motion:

Then, as my soul to heaven her first seat takes flight,
And earth-born body in the earth shall dwell,
So fall my sins, that all may have their right,
To where they’re bred and would press me to hell.
Impute me righteous, thus purged of evil,
For thus I leave the world, the flesh, the devil.

After death, the human soul instinctively ascends to the place of its origin, and the flesh is subjected to a vertical fall with speed directly proportional to the weight of its sins. In this image, Donne reformulates the iconographic motif of *psychostasis*, or weighing of souls, by providing that medieval visual convention with a scientific grounding. The poetic vision also illustrates the Calvinist doctrine of the imputation of righteousness (quoted word for word in the sonnet): when sinlessness is conferred on a man, his iniquities drop away in accordance with their inner principle of heaviness, so his soul no longer remains under the gravitational pull of hell. Commentators speak of “blatant theological sophistry” of the quoted lines (Sanders 1971: 128), discerning “an air of nervousness” (Young 1987: 34) with which Donne approaches the doctrine of imputation. The Aristotelian physics of natural motion, serving as the base of the metaphor, certainly underlines the effortlessness and passivity of a regenerate Christian in the process of attaining salvation,

which might indicate spiritual and psychological tensions raised by the dogma of unconditional election. In the whole sonnet, Donne represents the Christian grammar of eschatology and one's own perturbed awareness of mortality through the motion-related conceit.

"Holy Sonnet I" also draws on the theory of teleological motion. The lyric starts with consideration of qualitative change, namely birth and decay, which, in Aristotelian philosophy, are also caused by motion. The movement from corruption to regeneration mirrors what Malpezzi (1995), reading the sonnet on the level of tropological allegory, describes as "a hierophantic progress" from the past of humanity, through death, towards the eternal judgment (71). The paradigmatic journey from the creation of man through his moral corruption and fear of death is, as noted by Milward (1979), the subject of St Ignatius's meditative exercises of the First Week (86). In the opening line of Donne's "Holy Sonnet I," the I-speaker apostrophizes God, the originative source of his being and the agent of his alteration: "Thou hast made me and shall thy work decay?" A similar address to God can be found in "Holy Sonnet II":

First I was made
by thee, and for thee, and when I was decay'd
Thy blood bought that, the which before was thine.

Both quoted excerpts are based on the Aristotelian assumption that nothing can come into being on its own since everything that moves must be moved by something other than itself. This physical thesis validates the Christian position that humankind received its existence from God at creation and that the human soul, in the words of Augustine, "was made by God" (*City Of God*, 251). Dissevered from its moving agent and subjected to the progression of time, however, man, like all natural elements, undergoes degeneration. What Donne accentuates is that in the course of alteration and corruption, there persists in man the image of God ("that before was thine"), the restoration of which may reverse the decay process ("repair me now"). *Imago dei*, according to Martz (32–58), is one of the most important topics of meditation in Donne's devotional poetry. A corresponding theory in Aristotelian physics speaks of form, an immaterial substratum of matter, which remains intrinsically unchangeable while the attributes of substance transform and move. Corruption would then be construed as the privation of the divine element in the compound body of man. This identification of God with form, the principle of actuality prior to matter, and man with a mode of potentiality, the passive object of mutation, allows Donne to demonstrate the irresistible power of elective grace and man's inability to be saved without God's assistance.

In the second sestet, Donne returns to the conceptualization of inner depravity as the generator of man's natural motion downwards. The motif of the deathbed adds a physiological dimension to the kinematical metaphor as the weight of sins accounts for the heaviness and languor of the dying body ("my feeble flesh doth

waste / By sin in it, which it towards hell doth weigh"). In the same line, hell becomes the geometric center of gravity, the natural place of rest for man's flesh. Within this Aristotelian-Scholastic scheme, Donne introduces another physical concept: that of a violent motion. The following passage, namely, transfers the theme of *psychomachia* into the Aristotelian field of forces, re-directing the motions of the human soul to heaven:

Only Thou art above, and when towards Thee
By Thy leave I can look, I rise again;
But our old subtle foe so tempteth me,
That not one hour myself I can sustain.
Thy grace may wing me to prevent his art
And thou like adamant draw mine iron heart.

In this fragment, God is identified with an extrinsic force that guides the movement of man in the direction opposite of hell. Such imagery has its parallels in early modern literature and iconography. Donne's metaphors in the quoted passage display a striking similarity to Francis Bacon's moral counsel in "Of Innovations." In a sentence directly dependent upon Aristotle's scientific phraseology, Bacon attributes coerced motion to the workings of goodness and natural motion to sin inherent in the human soul: "For ill to man's nature as it stands perverted, hath a natural motion, strongest in continuance; but good, as a forced motion, strongest at first" (339). George Herbert, on the other hand, contemplates Sunday, a day "thredded on time's string," as a geometrical point in a line and a bead in a rosary punctuating the temporal dimensionless of the eternal realm. "Man," writes the poet, "had straight forward gone / To endless death" but Sunday, as an indicator of eternity, "dost pull / And turn us round," in an act representative of the violent motion of the Holy Spirit towards "the next world." Samuel Tuke adopts a more psychological line on the symbolism of motion. In the 1663 translation of Calderon into a play entitled *The Adventures of Five Hours*, man's misfortunes are compared to "natural motion [as] they acquire more force in their progression," whereas happiness, "ever strongest at the first setting out" and "languishing with time," is likened to "forced motion."

Themes of motion and force also emerge in Renaissance books of emblems. Quarles's emblem IX from Book 4 shows the body of a fallen man, lying "like a lump of the corrupted mass" encumbered by the weight of sins. This motionless flesh is being pulled with a rope by the figure of the Holy Spirit or the Hand of God. The inscription translates the conceit into physical vocabulary: "Oh raise me up and I will strive to go / draw me, oh draw me with thy treble twist / That have no power but merely to resist." In these words, the poetic persona supplicates God to overcome the power of resistance exerted by the man's inner depravity with the pulling force of the holy grace. Another emblemist, Christopher Harvey, represents the strength of Christ's "cords of love" in a fashion similar to Quarles's. Engraving 42 of *The School of the Heart* shows an angel, again symbolic of God's "helping hand

of grace," who is drawing the heart of man with a twined rope. Like Donne in "Holy Sonnet I," Harvey in Ode 42 (attached to the picture) compares God's love to a magnetic force that attracts even the "steel's stubbornness" of the human heart. Finally, Geoffrey Whitney rehearses the familiar comparison between the guiding force of virtue and the mechanism of a compass. His emblem 43 elaborates on the analogy: just as a loadstone attracts the iron pole in a compass pointing to the north star, so "inwards virtues" should draw our [iron] hearts" to "the heavenly star" steering man's nature to "the port of eternal bliss."

In comparison with Bacon's and Herbert's imagery, Donne's metaphor emphasizes more strongly that only God, through the operations of grace, can exert sufficient causal pull to counteract the crafty workings of the devil and the motive force of sins. From the perspective of scientific narration, this symbolism is dependent on two medieval physical notions: force and impetus. Medieval understanding of force, which allows Donne to equate it with a divine power, derives from Aristotle's *Physics* but also from the Neoplatonic theory of emanations.⁸ In contrast to Galileo, who reduced force to purely mechanical laws, medieval scholars conceived of force as a metaphysical phenomenon, that is, a set of influences (also of moral character) exerted by heavenly spheres on sublunary objects⁹ (Jammer 1993: 63). The physical forces in Donne embody "various kinds of holy violence and force" the subjection to which Lewalski (1979) recognizes as a typical Donnean trope (104).

Furthermore, the sentence "That not one hour myself I can sustain" conjures up the medieval theory of the impetus, or an incorporeal quality impressed by the initial mover on the body to help sustain its motion. In Donne, impetus is analogized with man's free will or internal disposition for good. Donne's commentators often note this reliance on an outside force in man's movement towards God; nevertheless, they do not refer it to the discourse of physics. Stachniewski (1981), for example, finds in Donne's use of modal verbs ("thy grace may wing me, I can [not] myself sustain") evidence that the poetic persona, "so strongly tempted by the devil to despair," is in fact powerless in his absolute dependence on the mercy of God (699). According to Rollin (1994), the I-speaker stages his spiritual paralysis in terms of objectification and immobilization; "reduced into an artifact," he "is a hollow man, 'feebled flesh,' or he is but a sack of sin," proclaims the critic (149). These interpretations can be related to the theory of the impetus, on which, I believe, the poetic image rests. To couch it in physical language: without the permanent agency of the holy spirit, communicating its force on man, the power of impetus in man gradually diminishes until it is overcome by the resistance of sins.

As a rhetorical preference and as a philosophical foothold, then, the physical imagery in "Holy Sonnet I" serves to articulate the Calvinist exposition of unmerited grace, to reinvigorate the literary topos of *psychomachia*, and to signify the nature

⁸ On the influence of Neoplatonic theory of emanations on the medieval concept of force, see Leaman (208).

⁹ This is how force was understood in astrology: as distant causality transmitted across space.

of temptation and deliverance from sin. The metaphors of motion and force lend sensual immediacy and philosophical validity to Donne's penitential meditations on the Last Things in Holy Sonnets I and VI, and they re-inscribe his argument into the theological frameworks of Aristotelian-Scholastic theory and Renaissance science.

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All emblems mentioned in the paper can be found at the Pennsylvania State University Library's online *English Emblem Book Project* <<http://emblem.libraries.psu.edu/catalog.htm>>.