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“Petty Magic to Experiment”
The Seventeenth-Century’s Scientific Revolution and the
Closing of this World to the Next

by

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ABSTRACT

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The shift from a traditional, being-based Christian cosmology—in which God creates all things through an ontologically-invested reason in which man shares—to a voluntarist, will-based Christian cosmology—in which God creates all things through an arbitrary act of will knowable to man only through experience—is considered crucial to the rise of empiricism and its related experimental method, two cornerstones of the Scientific Revolution. This dissertation examines how the shift from a being- to a logos-based cosmology, with its entailed shift from a realist to a nominalist ontology, affected this world’s relation to a next. It explores this issue by considering the resurrection views of three writers whose works, taken together, span the seventeenth-century both temporally and intellectually, from the vestigial medieval scholasticism of John Donne (1572-1631) through the Renaissance neo-Platonism of Thomas Browne (1605-1682) to the Early-Modern mechanism of Robert Boyle (1627-1691). This dissertation argues that the traditional, being-based cosmologies shared by Donne and Browne underlie their teleological understandings of natural processes and, in doing so, allows them to find evidence in this world for resurrection to the next. Boyle’s voluntarist cosmology, on the other hand, banishes inherent teleology from the natural world and thereby silences this
world with regard to a next. This dissertation further argues that this shift in cosmology and more specifically, the entailed shift from a realist to a nominalist ontology, allowed man to make nature speak a new, operational language that could be used to man's benefit. By considering works written around the time of London's 1665 plague, we will see how mechanistic medicine produced such operational knowledge through the use of human-made instruments and methods, including experimentation. Although such knowledge provides no intelligence about a next world, it does allow humanity to make its way better in this one.
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Introduction

A number of scholars studying the relationship between religion and natural philosophy in Europe during the Scientific Revolution have recognized the pivotal importance a voluntarist cosmology had for that revolution. As Eugene Klaaren remarks, “Not only was belief in creation presupposed by virtually all the diverse figures in the rise of modern science, but voluntarist orientations toward divine creation had especial significance” (29). The shift from a traditional, being-based Christian cosmology—in which God creates all things through an ontologically-invested reason in which man shares—to a voluntarist, will-based Christian cosmology—in which God creates all things through an arbitrary act of will knowable to man only through experience—is considered crucial to the rise of empiricism and its related experimental method, two cornerstones of the Scientific Revolution. The effect this shift in cosmology had on knowledge of this world has received extensive treatment by a numerous scholars, including Eugene Klaaren, Francis Oakley and Joseph McGuire. The effect this shift had on knowledge of the next world, however, has gone unnoted.

This dissertation examines how the shift from a being- to a logos-based cosmology, with its entailed shift from a realist to a nominalist ontology, affected this world’s relation to a next. It explores this issue by considering the resurrection views of three writers whose works, taken together, span the seventeenth-century both temporally and intellectually, from the vestigial medieval scholasticism of John Donne (1572-1631) through the Renaissance neo-Platonism of Thomas Browne (1605-1682) to the Early-Modern mechanism of Robert Boyle (1627-1691). This dissertation argues that the
traditional, being-based cosmologies shared by Donne and Browne underlie their teleological understandings of natural processes and, in doing so, allows them to find evidence in this world for resurrection to the next. Boyle’s voluntarist cosmology, on the other hand, banishes inherent teleology from the natural world and thereby silences this world with regard to a next. This dissertation further argues that this shift in cosmology and, more specifically, the entailed shift from a realist to a nominalist ontology, while rendering this world dumb of metaphysical meaning, allowed it to speak a new, operational language that man could put to use in making his life in this world more comfortable.

As our consideration of Robert Boyle will show, the will-based cosmology, with its entailed nominalism, grounds the mechanical philosophy so crucial to the Scientific Revolution by “replacing the teleological and organismic pattern of thinking and explanation by the mechanical and causal pattern) (Koyré).\(^1\) Whereas the vitalistic ancient and Medieval traditions had viewed nature as an organism striving towards its own telos or goal, as determined by its real, “substantial form,” the Scientific Revolution

\(^1\) Koyré refers here to a particular idea of cause as “an event antecedent to and necessarily connected with another event called the effect...a definition established in the eighteenth-century by Hume” (Collingwood 7). Preceding this contingent notion of causality was Aristotle’s very different, necessary notion of causality, which viewed causality as rooted in the essential nature of things. None of Aristotle’s four causes—material, formal, efficient or final—was regarded as an event prior in time to its effect (even the efficient cause is not an event but a substance, i.e., the seat of power).
viewed nature as a machine; rather than an organism operating according to an “indwelling rationality” (Oakley 84), nature was now considered to be the effect of a will and intelligence external to it—namely, those of: the machine’s maker. Of course, almost all European natural philosophers of the time were quick to point to God as the machine’s maker. Yet, once the natural world’s operations are determined not by internal forms but by an external will, it does not matter, epistemologically speaking, if that will belongs to God or man. 2 Thus, the mechanical view of the world freed man to place natural

2 The Scientific Revolution cordoned off a realm of “secondary causes,” which describe the world’s operations and which man was free to manipulate for his own ends. The notion of purpose—a purpose man’s purposes might contradict—was restricted to the realm of a “first cause.” This “first cause,” i.e. God, was not knowable by study of nature: “If any man shall think by view and enquiry into these sensible and material things to attain that light whereby he may reveal unto himself the nature or will of God, then indeed is he spoiled by vain philosophy; for the contemplation of God’s creatures and works produceth (having regard to the works and creatures themselves) knowledge; but having regard to God, no perfect knowledge, but wonder, which is broken knowledge” (Bacon 371). This abyss between knowledge of nature and knowledge of God could not be bridged intellectually, but only by a leap of faith, a spiritual “flight to Providence and the Deity:” “For while the mind of man looketh upon second causes scattered, it may sometimes rest in them, and go no further, but when it beholdeth the chain of them, confederate and linked together, it must needs fly to Providence and Deity” (371). But the fear Bacon implies here, that the natural philosopher may rest in his or her knowledge
materials into processes of his own making—i.e., experiments—in order to gain knowledge that would allow man to realize his own ends; whereas earlier natural philosophers “had aimed above all at understanding the natural world; the new philosophers typically aimed, by contrast, at successful prediction and control” (Revolutionizing the Sciences 3).

By considering works written around the time of London’s 1665 plague, we will see how mechanistic medicine set about producing such operational knowledge through the use of new, human-made instruments and methods, including experimentation.

of secondary causality and not look to God as the “first cause” was a very real one. For in the new natural philosophy itself, there was no place for God—Bacon’s recommended “flight to Providence” is a moral imperative, not an epistemological necessity. Thus it is not surprising beginning in the Renaissance “scientists in all fields showed a strong inclination to avoid talk of first and final causes, to concentrate instead on second causes and omit the supernatural causes lying behind them” (Kocher 140).

3 As Dear has noted: “Experimental contrivance was permissible when the goal was operational knowledge rather than teleological knowledge of nature.” For in the Aristotelian view that a natural process is determined by a cause (or “purpose”) operating in the material, “the natural course of a process could be subverted by man-made, artificial causes, because art replaced nature’s purposes with human purposes;” in the case of experiments, this “human purpose” was “to make operational, or at least phenomenological, knowledge; this cannot, by definition, be a natural goal” (Discipline and Experience 158).
Through these new instruments and methods, mechanistic medicine was able to elicit “symptoms” from a body otherwise devoid of them, thereby (it was wrongly believed) helping to stem the plague’s spread by sequestering the sick. Of course, such human production of symptoms entailed a fundamental change in their meaning—no longer symbolic expressions of God’s intention, symptoms became mere indices of disease. Such purely syntactical, operational knowledge as that provided by these new symptoms provides no intelligence about the next world, but it does allow humanity to make its way better in this one.

The first chapter focuses on John Donne’s “A noottinnall upon S. lucies day, being the shortest day.” Donne was more an observer than a participant in the Scientific Revolution. In fact, Donne was a fundamentally traditional thinker who, born into a Roman Catholic family and converting to Anglicanism as a young adult, was “a disciple of the philosophy of St. Augustine and St. Aquinas” (Simpson 15) and inherited their

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4 The plague was incorrectly believed to be air-borne and thus capable of being passed between people through casual contact. In fact, the plague was carried by fleas, and transmitted primarily by fleabite.

5 Donne’s lack of interest in the new science was both a matter of timing—Bacon’s influence...was only slightly felt [before 1640],” and a matter of temperament: “Donne’s interests were broad, and he disdained mere fact-gathering, instead looking for the symbolic and transcendent meaning of the material world (Ellrodt, 182; 187-189).
being-based cosmology. By reading Donne’s “A nocturnall” in light of his sermons and his other poetic works, this chapter shows how Donne’s being-based cosmology underlies his traditional, basically Augustinian understanding of resurrection. As we will see, this cosmology presents the natural world as a closed qualitative system, divided hierarchically into levels of “being” (i.e., ultimately, God’s presence). Since this “being” encompasses all of creation, Donne views both physical and spiritual resurrection as the

6 Augustine’s theology was “explicitly ontological,” positing God’s being as the ground of all creation, and thus provided the foundation for what would come to be known as the “hierarchy of being,” but the elaboration of this hierarchy happened later: “It remained for Anselm and Thomas to state in careful detail a theology of the hierarchy of created being ranging from divine, angelic, and human being down to the lowest reaches of prime matter. The great Christian chain of being was partly borrowed from classical Greek ontology, but it was secured in that divine ground of being which was, in turn, variously reflected throughout diverse levels (densities) of created being” (Klaaren 30).

7 The doctrine of two resurrections, one of the soul and one of the body, is found in the works of St. Augustine, who bases it on various Old and New Testament texts, especially Revelation 20:14 (O’Daly 210-214; see also Versfeld 114, and Kelly 480). Others use these same texts to argue for millennialism—the view that the resurrection preceding the general one is not a spiritual resurrection, but rather, the resurrection of the chosen to enjoy a 1000-years existence on a restored earth (Kelly 480 ff.). Yet, the necessity of both spiritual and physical resurrection is called for by the fact that Christian cosmology places an ontological divide not between the physical and spiritual, but rather the created
same ontological process, taking place on different levels of reality. Specifically, Donne views life in this world, both physical and spiritual, as a process of “dying,” or degeneration of being through a fall from God (the source of all being). Yet, it is precisely in this current process of degeneration that Donne sees the possibility of, indeed, the necessity for, a future “resurrection,” i.e., the restoration to full being through reunion with God.

The second chapter focuses on Thomas Browne’s essay “The Garden of Cyrus, or the Quincunciall, Lozenge, or Net-work Plantations of the Ancients, Artificially, Naturally, Mystically Considered,” which Browne prefaces by referring to it as a “Symbolle of the Resurrection” (321). Browne was much more interested in the systematic study of the natural world than was Donne. But while Browne shares the Scientific Revolution’s interest in observing and compiling information about the natural world, “he was unable to respond fully to the work of Boyle and his contemporaries, who were of a later, more decisive phase of scientific thought” (Approaches to Browne 143).  

(i.e., everything but God) and the non-created (i.e., God); the human soul, as created, is not inherently immortal and is open to the same corruption, and thus in need of the same resurrection, as the human body. As Robinson observes: “The Christian eschatology of the individual departs from the [Greek] immortality doctrine” in that “its hope of eternal life rests solely on its doctrine of God, and not on its doctrine of man. There is nothing in man, however noble, which is not subject to death and by nature corruptible” (92).  

8 As Dunn observes with regard to Browne’s intellectual conservatism: “[Browne] revolves serenely in the old orbit that centered in the Ptolemaic astronomy and the
In fact, Browne was a fundamentally conventional thinker, deeply immersed in Christianized Neo-Platonism and Aristotelianism. These two influences are evident throughout “The Garden,” which combines the idealism of neo-Platonic metaphysics (especially Pythagorean number theory) with the functional teleology of Aristotelian biology to present God as the supreme ordainer, ordering the natural world both structurally, in terms of essences, and diachronically, in terms of development. Indeed, for Browne the two types of order as inseparable, for the “form” that is the natural entity’s essence (thereby positioning it in relation to others through God’s eternal being) is also that entity’s efficient and formal cause, sustaining and directing the entity’s existence in this world.

Although Browne finds all kinds of providential ordering in the natural world, from the symmetrical color in sheep limbs to the non-transversible order of a seed’s development into a plant, Browne’s favored mode of ordering throughout “The Garden” is what he refers to as “the quincunical order,” based on the number five and its geometrical expression, the quincunx. Indeed, Browne’s seemingly inexhaustible ability to find quincunical order in the natural world have led many critics to dismiss “The Garden” in terms similar to those used by Walter Pater, who claims that Browne’s “chimeric fantasy carries him here into a kind of frivolousness” (140). In fact, the cosmogony of Moses…Except Harvey, contemporary scientists are given slight attention in Vulgar Errors [Browne’s encyclopedic natural history] and though Copernicus, Galileeo, Gilbert and Descartes are mentioned with respect, they are not dignified to the level of authorities” (8).
opposite is true. Far from being frivolous, these numerical and geometrical orderings of five are, in Browne’s view, what gives the natural world its significance, connecting it to both God and the end-time; “The Garden’s” quincuncial orders are forms expressing God’s structural relation to, and providence of, the created world, as well as the symbol of that world’s ultimate perfection in humanity’s resurrection as its microcosm or “contracted essence.”

The third chapter focuses on Robert Boyle’s essay, “Some physico-theological considerations about the possibility of the resurrection.” Boyle was a full-fledged participant in, and even a leader of, the Scientific Revolution. And like the vast majority of such participants and leaders, Boyle was also deeply religious. While a number of Boyle’s religious views inform his scientific ones, none do so fundamentally as his voluntarist theology; Boyle’s entire “anti-rationalist experimental philosophy went hand in hand with his theological voluntarism” (Boyle Reconsidered 132).

While the voluntarist cosmology gained widespread acceptance during the seventeenth century and was crucial to that century’s scientific revolution in England,

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9 The importance of Christianity to the Scientific Revolution in Europe has been examined by many, including Eugene Klaaren, who emphasizes the importance of Christianity’s belief in God as Creator: “The presupposition of created being provided a context in which the natural world was taken as a single system” (30-31). As Klaaren further observes, “Not only was belief in creation presupposed by virtually all the diverse figures in the rise of modern science, but voluntarist orientations toward divine creation had especial significance” (29).
this cosmology had in fact been around for quite a long time before. Indeed, the idea of the absolute sovereignty and freedom of God's will in relation to his creation extends back to Augustine (Klaaren 33). Yet, throughout the history of Christian theology, the absolute freedom of God's will was tempered by his divine wisdom or rationality, with even St. Augustine "assert[ing] that God's holy order rationalized his omnipotence" (Gillespie 14). And for most of the Middle Ages, Christian theology emphasized the primacy of God's reason over his will.

But while this battle between the primacy of God's wisdom or omnipotence tended to wisdom's favor during most of the Middle Ages, the conflict could never be entirely resolved, for it springs from a structural fissure in Christian philosophy—namely, that philosophy's grounding in two very different intellectual traditions, ancient Greek and ancient Hebrew, two traditions with very different conceptions of the world and God's relationship to it: "The perceived conflict over the primacy of various of God's attributes [specifically, wisdom and power] had its origin in the clash between classical Greek rationality and the providential God of the Jews" (Wojcik 200). From patristic times, Greek neo-Platonism heavily influenced Christian cosmology. Although not accepting the neo-Platonist theory of emanation, which would have compromised God's transcendence, Christian theology did adopt the neo-Platonic view of an eternal realm of divine "ideas" that orders the temporal realm of material creation. According to this cosmology, the created world is ontologically secured and ordered by God's rational, eternal being: "Contemplating His own essence from eternity God sees in Himself all possible limited essences, the finite reflections of his infinite perfection, so that the essences or rationes of things are present in the divine mind from all eternity as the
divine ideas... [these divine ideas] neither arise nor pass away, but whatever arises and passes away is formed according to them” (Coplestone i.73). The voluntarist cosmology, on the other hand, is rooted in the Hebrew view of God as absolute Creator and Sustainer of the world. Viewing the Neo-Platonic cosmology as “attribut[ing] necessity to nature and by implication set[ting] boundaries to God’s omnipotence” (Wojcik 33), the voluntarist cosmology presents God “as a free, all-powerful will, as unconstrained by the necessity of a single rational order of divine ideas to create a world that reflect only that one, ideal, rational order” (Bono 82).

“This clash between classical Greek rationality and the providential God of the Jews reached its peak with the reception of the Aristotelian corpus into the Latin West,” when the rationalism of late Medieval Scholasticism seemed to some an affront to God’s omnipotent will. “The result was a series of official decrees beginning in 1210 and culminating in the condemnation of 219 propositions in 1277. Above all, the condemnations denied the natural necessity implicit in Averroist Aristotelianism and affirmed God’s absolute power and freedom. As a result, many Christian philosophers began emphasizing the contingency of the created world and the inscrutability of God’s will, a tendency that culminated in the nominalism of William of Ockham (c. 1285-1349) and his followers” (Wojcik 200). Thus, while the voluntarist cosmology “had a long history in the Middle Ages; for the history of science, it began in important ways with the condemnations of 1277” (Osler 180) for it was these that fostered the birth of nominalism—and as we will see, it is nominalism that provided the “indispensable ontological and epistemological presuppositions of Renaissance and early modern science” (Gillespie 21).
Traditional metaphysics had posited God as “the highest being...[with a] hierarchy of beings or orders of perfection stretching to and including God” (Gillespie 26). Since each created thing’s “form” of being was grounded in God’s rational being: “The metaphysics of traditional scholasticism [had been] ontologically realist in positing the extramental existence of universals such as species and genera as forms of divine reason” (Gillespie 12). Since these universals provide creatures with their essential natures, to know the universal form expressed in a specific creature was to know everything about that creature that counted as true knowledge.\(^\text{10}\) Furthermore, since these universals were all ideas of God’s mind, they formed one, rational system. Accordingly, the relationships among various creatures could be known by logical deduction given the relative positions of their forms. In sum, “within [the realist] ontology, nature and logic reflect one another, and one can describe nature by means of a syllogistic logic that expresses the relationships among all universals” (Gillespie 12).

The voluntarist cosmology, however, has no place for such real universals or “forms,” which were, as seen above, the material expression of those divine ideas with which voluntarism was so loathe to burden God’s will: “The advent of late medieval voluntarist theology marked the beginning of an orientation to creation which...refocused the work of the Creator in terms of His supreme will rather than the divine intellect. In relation to the Creator’s will, the contingency of creation was emphasized in contrast to more rational relations of participation” (Klaaren 33). As Klaaren remarks, this new

\(^{10}\) As Dear remarks, “To give a scientific explanation was to give an account of a thing’s particular nature or form” (Discipline and Experience 154).
"orientation to creation" included the "nominalist rejection of universals." Rather than real forms operating in the material world, such "universals," according to nominalism, are nothing more than the products of man's epistemological limits: "Unlike God, man has need of universals and generalizations. Nonetheless, every multiplication of universals is a step away from actuality... an impression of contingent relationships or similarities between individual existences" (Gillespie 19). Whereas in the realist ontology the relationships among things are entailed in their forms or natures, and thus deducible from them, in the nominalist ontology such relationships are external and contingent to the things themselves, and thus knowable only through observation;\(^{11}\) given the nominalist ontology, "laws of nature' could not be found a priori from first principles, but had to be discovered from the works of creation" (Free Enquiry xv).

Having freed man's "powers of reason...from the logic of being" (Klaaren 37), nominalism allowed man to pursue knowledge of the world in new ways. Whereas the realist, Aristotelian-inspired Scholastic philosophy had relied primarily on logical deduction to know nature,\(^{12}\) the new nominalist philosophies relied primarily on

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\(^{11}\) As Gillespie remarks in this regard, "If all things are radically individual, then universals are merely names (nomina), verbal tools created by finite human beings for the purpose of dealing with the vast array of radically individual things. Universals in this sense have only a logical meaning. Logic thus becomes a logic of names or signs rather than a logic that expresses the real relations among things" (18).

\(^{12}\) This is not to say that there was no induction, or movement from the specific to the general, in realist natural philosophies. In fact, Dear has argued that Aristotle's realism
induction from observation for this purpose, thus paving the way for the Scientific
Revolution’s empiricism: “Lack of necessity in the world implies that a priori,
demonstrative knowledge of the creation is not possible. Thus, a nominalist ontology and
an empiricist epistemology are regular concomitants of voluntarist theology” (Osler 180).

underpinned a certain type of induction: “Aristotle’s belief in the reality of universals as
entities existing above and beyond their individual instances played a crucial part in
establishing one very influential sense of ‘induction,’ called later ‘demonstrative
induction.’” Such “demonstrative induction” is “the recognition of an essential, necessary
truth regarding some class of things;” in other words, it is “when the mind grasps the
universal in the particular by inspection...Induction in this sense thus allowed the
establishment of universal truths practically by inspection and took for granted the
proposition that universals are real rather than being nominalistic categories”
(Revolutionizing the Sciences 26). Patristic and Scholastic theology embraced such
“demonstrative induction.” While Augustine, for example, believed that universals could
be known by “divine enlightenment,” he also believed they could be known through “an
analogical investigation of nature” (Gillespie 15). Of course, such “demonstrative
induction,” with its grasping of universal natures, was not acceptable in nominalist
natural philosophies. Francis Bacon, for example, argued that “True induction must take
the place of pseudo-induction...Regulated induction, which leads from step to step in a
continuous chain from simple observations to general axioms, should replace the method
of invention so far in common use, to wit the jumping from the simple to the highest and
the particular to the Universal” (Pagel 498).
Nominalism not only promoted experience as a way to pursue knowledge, but also legitimized the creation of a new type of experience to pursue this same end—namely, the experiment. As Peter Dear has argued, the realist’s teleological conception of natural processes is incompatible with the scientific method’s appeal to the one-time or “historical” event—i.e., the experiment—as a legitimate basis for knowledge. In realist natural philosophies, “natural processes are goal-directed [and] we cannot understand them other than in terms of the end-states to which they…tend” (Companion to Aristotle 128), for it is in such end-states that the forms are manifest. Yet, this “end-state” is not always reached, natural “processes might fail to fulfill themselves for a variety of reasons: a concatenation of various accidental causes, each in itself ‘natural,’ could pervert the course of a given process; most radically, for Christianized Aristotelianism,

13 “It is not until the 17th century that singular, contrived events become generally used as foundational elements in making natural knowledge; modern experimental science appears in the 17th century. Before then, Western natural philosophy used singular, historically reported experiences mostly as illustrations of general knowledge-claims, or as occasions to investigate some issue, but not as arguments to justify universal propositions about nature” (Discipline and Experience 13).

14 With regard to the individual creature, “the [realist] form is an internal structural principle striving to actualize itself as the fully mature individual” (Companion to Aristotle 128). Taken as a whole, i.e., as the entire complex of such creatures, “Nature [is] the principle of motion, or change…teleologically conceptualized as the effect of process, or the striving towards a goal” (Revolutionizing the Sciences 154).
god could always exercise his *potentia absoluta* to bring about an irregular occurrence" (Discipline and Experience 154). In other words, the result of any particular process might be a “monster” (due to some obstinacy of the matter—“a concatentation of various accidental causes”—in which the form is striving to realize itself) or a “miracle” (due to God’s supernatural intervention in the process). Accordingly, “singular instances,” such as the experiments reported throughout that official mouthpiece of the English scientific

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15 Boyle viewed “chance” as nothing more than a figment of man’s imagination, the byproduct of another such figment— inherent teleology. In contrast to a “form” realizing itself in matter—a process that could be disturbed by “chance,” i.e., events not recognized as part of the normative, natural process of realization—Boyle believed that all “things that are done in the corporeal world, are really done by the parts of the universal matter, acting and suffering according to the laws of motion established by the Author of nature. But we men, looking upon some of these parts as directed in their motions by God, or at least by nature, and disposed to the attainment of certain ends; if by the intervention of other causes, that we are not aware of, an effect be produced very differing from that, which we supposed was intended, we say, that such an effect was produced by chance...chance only means ‘that in our apprehensions the physical causes of an effect did not intend the production of what they nevertheless produced’” (v. 410). In Aristotle, on the other hand, ‘chance’ would be something real—namely, matter’s interference with the *telos*-guided development.
revolution, *Philosophical Transactions of the Royal Society*,\(^\text{16}\) "might not represent the ordinary course of nature and so could not establish the nature of a particular process" *(Discipline and Experience* 155).

Indeed, the study of nature was no longer locked into the "nature of a particular process" or processes. For once the position and changes of a body is no longer inherent to it, i.e., determined by its form, man is free to put such a body into combinations and processes of his own choosing: "Where Aristotle's 'experience' spoke of what was known about how the world routinely behaves, the seventeenth century saw increasing recourse to deliberately fabricated experiments that revealed behaviours that had sometimes never been seen before. Experimental investigation relied on the notion that what nature can be made to do, rather than what it usually does by itself, will be especially revealing of its ways" (Shapin 7). As Rose Mary Sargeant summarizes nominalism's effect on natural philosophy: "Not only had the order of inquiry and demonstration been inverted, but the very meaning of knowledge had been altered. No longer was the sign of knowledge to be the deductive certainty of the logical or metaphysical systems of classic philosophy. Knowledge was now that which has a 'tendency to use'" *(Boyle Reconsidered* 59).\(^\text{17}\)

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\(^{16}\) Dear contrasts the importance of empiricism and experiment in the work of British scientific revolutionaries to the continuing importance of logic and demonstration in some of their Continental contemporaries, including Descartes and Hobbes.

\(^{17}\) "Bacon's vision of natural philosophy, in contrast to the Aristotelian, saw it as an endeavor that would be productive of works; that is of practical applications. This was so
Although Boyle’s voluntarist theology and nominalist ontology supported his empirical and experimental natural philosophy, they greatly impaired his attempt to find religious or spiritual meaning in the natural world. In “Some considerations,” Boyle joins a long tradition, extending back to patristic times, of defending the Christian doctrine of the body’s resurrection. Chapter three’s reading of “Some considerations” in the context of this tradition will show that Boyle does not find in the natural world the evidence for resurrection that this tradition had. For given the nominalist nature of this philosophy, Boyle is unable to consider the natural world as proceeding towards an end established in the nature of things and operating throughout their lives, for there is no longer any “nature of things”—i.e., an intelligible “system of essence-determined parts” and processes—instead, there are only “individual, contingently related entities characterize[d] solely by primary qualities” (McGuire 529-530)—“primary qualities” that are only the transitory effects of matter in motion. Although this motion is regular and thus subject to empirical knowledge and mathematical formulation,\(^\text{18}\) it is bereft of much the case that he spoke of this productiveness as not merely a consequence of proper natural philosophical knowledge, but as the very criterion of its truth” (Revolutionizing the Sciences 60).

\(^\text{18}\) Of course, such mathematical formulation is radically different from the symbolic, neo-Pythagorean math seen in Browne’s “Garden:” “For the Neo-Pythagorean and Neo-Platonic treatments of metaphysical number, the virtue of ontological number consists in its power and perfection of existence, its immutable nature and transcendental status from which it generates and orders the world of particulars. Its order is not that of quantity or
metaphysical meaning. Boyle faced the same “Book of Nature” that Galileo had, a book whose “divinely inscribed language of mathematics produces, and creates in man, only a literal sense. The Book of Nature tells us only about nature; it reveals only how nature carries out God’s commands. It tells us nothing about God’s intentions or about heaven” (Bono 198).

Although the loss of realist forms and their immanent teleology rendered nature incapable of witnessing to anything beyond its own functioning, it opened the way for man to pursue knowledge of this functioning much more aggressively. Chapter four explores how during the 1665 London plague mechanistic medicine went about eliciting measurement, but of classification … the metaphysical status assigned [to such number] is not reducible to any procedures or applications” (Strong 34).

19 As Boyle remarks, experimentation is a much more efficient means of gaining operational knowledge than is mere observation: “And though I know that some of the things my experiments tend to manifest may likewise be confirmed by the more obvious phaenomena of nature, yet I presume you will not dislike my chusing to entertain you with the former (though without at all despising, or so much as strictly forbearing to imploy the latter) because the changes of qualities made by our experiments will, for the most part, be more quick and conspicuous; and the agents made use of to produce them being of our own applying, and oftentimes of our own preparation, we may be therefore assisted the better to judge of what they are, and to make an estimate of what they do” (“Origin of Forms” 14).
operational knowledge from nature through the use of new, man-made instruments and techniques.

Although Christian belief in resurrection to a next world is ultimately based on Christ’s historical resurrection as fulfilled Revelation, since patristic times and into the seventeenth century the natural world had supported such belief; as Thomas Burnet remarks: “Having prov’d from Scripture, that we are to expect New Heavens, and a New Earth, after the Conflagration, it [is] some pleasure and satisfaction to see how this new Frame will arise: and what foundation there is in Nature for the accomplishment of these promises....what hopes there is of a Restauration” (Burnet iv.ii.93; my emphasis). The early-modern shift from a being- to a will-based cosmology and the entailed rejection of realist forms took away resurrection’s “foundation...in Nature” while at the same time making England’s scientific revolution possible; the natural world could now make life in this world easier, but it could no longer serve as “an ease to us in our belief” about a next one (Burnet iv.ii.93).
Chapter One

The Metaphysics of Traditional Resurrection and its Inversion in
John Donne’s “A nocturnall upon S. Lucies day”

Although there is little critical consensus concerning John Donne’s “A nocturnall upon S. Lucies day, Being the shortest day,” critics do agree that the poem negotiates a relationship between the human and divine worlds and, more specifically, the loves of both worlds. In doing so, “A nocturnall” takes part in a dominant thematic pattern of Donne’s poetry and helps to “illustrat[e]the way in which Donne’s poetry, throughout his career, moves along a Great Divide between the sacred and the profane, now facing one way, now another, but always remaining intensely aware of both sides” (Martz 215). With regard to which side of this “Great Divide” the bereaved speaker ends up facing, there is substantially more disagreement. As Emma Roth-Schwartz observes, “commentators are divided on whether ‘Nocturnall’ ends in despair, hope, or stasis,” adding that “a satisfactory answer requires consideration of [the poem’s] liturgical and alchemical references, and upon a resolution of the poem’s other cruces, both verbal and accidental, that rests on a more consistent and empirical theoretical basis than any analysis has shown to date” (89).20

20 While previous studies of “A nocturnall” have illuminated various aspects of the poem, none has coherently explicated the poem as a whole. As Frost remarks, “Of all Donne’s canon (with the exception, perhaps, of the Anniversaries) […] ‘A Nocturnall upon S. Lucies day’ […] has been, in effect, the most resistant to critical approaches of any century or decade” (149).
The "more consistent and empirical theoretical" interpretive basis for which Roth-Schwartz calls—one that unites the Christian (though not specifically liturgical) and alchemical aspects of "A nocturnall" into a coherent message while elucidating

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21 Some have denied alchemy's importance to understanding "A nocturnall." One critic, for example, contends that "Donne was not so naive as to believe in alchemy, and not believing, he could not base his poem directly on that particular philosophy" (Sleight 49). However, as Duncan observes, there is a crucial difference between Donne's poems that "make use of particulars of alchemical theory or practice" and those whose "figures turn on an expressed or implied opinion of the science as a whole or of its practitioners" (76, 74). In the latter group of poems, "the opinion of alchemy is the same as that expressed in numerous contemporary popular satires: that alchemy is largely imposture or self-deception, alchemists charlatans or self-gulling dupes" (74). But in the former group of poems, which includes "A nocturnall," "the ultimate, or even the apparent, truth or falsity of the concept is not of immediate moment in [Donne's] purpose. Sufficient is the fact that the concept exists as an accepted part of the mass of beliefs known as alchemy and that it can be fairly transferred from its logical connection with that science to body forth or explain a concept in another realm of thought or knowledge which is the poet's subject" (76).

Even those critics who have taken alchemy in "A nocturnall" seriously have met with little success. Frost provides a good summary of these attempts (150-153). Although she reserves her censure primarily for those belonging to the "School of Despair" (opposed to the "School of Regeneration," whose views are closer to her own), Frost's criticism of
the poem’s many paradoxes—is provided by a worldview (specifically, a cosmogony with its entailed ontology) that in its basic structure is found in both the Christian and alchemical traditions.22 This worldview is implied throughout “A nocturnall,” most centrally in its presentation of the spiritual process undergone by its speaker in alchemical terms. For this presentation evokes a convention that is itself based on this worldview—namely, that of figuring Christian spiritual resurrection in terms of alchemical transformation. Nevertheless, although the spiritual process undergone by the “nocturnall’s” speaker is formally similar to both Christian and alchemical resurrection, in that he is reduced to a state of complete non-being and then re-begot to a new existence, the speaker’s spiritual regeneration is in fact based on an inversion of the “being,” and its associated values, on which such conventional forms of resurrection are based.

By reconstructing this worldview underlying Christian and alchemical

“excerptive” readings based on anachronistic and “inexact comprehension of the relationship between spiritual and practical alchemy and of the process itself” (151) can be directed at members of both groups, as well as at Frost herself.

22 With regard to the Christian tradition, Brunn traces this worldview (emphasizing its ontological over its cosmological aspects) back to St. Augustine and ultimately to the neo-Platonic philosopher Plotinus. With regard to the alchemical tradition, Ritchie traces this worldview back to Stoic and Aristotelian principles as elaborated on by Neo-Platonism. The most detailed historical treatment of this worldview remains Arthur Lovejoy’s seminal work *The Great Chain of Being.*
resurrection in "A nocturnall," this chapter shows that the state of complete spiritual non-being in which the speaker lies following his beloved's death is not only a subjective state of despair but also an objective state of ontological privation: the endpoint of a sin-initiated process of decline from immutable being, identified with God, into the change or non-being of this world. This state of complete non-being or death is also the point at which this process can be redeemed through resurrection—that is, the restoration to full being through an act of re-creation.\(^{23}\) However, in order to undergo spiritual resurrection, or restoration to full being, one must forsake one's spiritual attachments to this world of non-being. The death of a loved one, such as that suffered by speaker in "A nocturnall," conventionally prepares one to do this by making obvious the transitory and ultimately painful nature of such attachments.\(^{24}\) But, while the speaker demonstrates full awareness of the transient and fragile nature of life and love in this world, his continued devotion to his beloved makes him unwilling to

\(^{23}\) Thus, for example, when the speaker in Donne's "The Litanie" finds himself in the same state of spiritual "ruin" as the speaker in "A nocturnall" does, the former turns to God for spiritual resurrection, asking Him to "come / And re-create mee, now growne ruinous," so that "new fashioned / I may rise up from [spiritual] death, before I'm dead" (3-4, 8-9).

\(^{24}\) Donne observes with regard to "that man upon whom Gods hand hath been in the losse of something, that he had before:" "As the body of man is mellowed in the grave, and made fit for glory in the resurrection, so the minde of man by suffering is supplied" and thus prepared for spiritual resurrection (Sermons 4:172; my emphasis).
forsake this world for the next, or human for divine love. Rather than “return[ing] to God with a whole and entire soul, without dividing or scattering [his] affections upon other objects,” to undergo a spiritual resurrection (Sermons 6:362), the speaker in “A nocturnall” responds to his beloved’s death by spiritually re-creating himself on the basis of this world of non-being and becomes its “Epitaph,” in which role he commemorates life amidst death and love amidst loss.

The world to which we are introduced in the first stanza of “A nocturnall” is a dismal world, a world of little light and declining life:

The Sunne is spent, and now his flasks
Send forth light squibs, no constant rayes;
The worlds whole sap is sunke:
The generall balme th’hydroptique earth hath drunk,
Whither, as to the beds-feet, life is shrunk,
Dead and enterr’d [..] (3-8)

The darkness of this world has been attributed to the speaker’s emotional state: having lost his lover to death, projects his own dark melancholy onto the world.\textsuperscript{25} For Donne, however, such a world is not the projection of a distraught human subjectivity. Instead, it is the objective world, the world we all inhabit. For Donne’s portrayal of the world in “A nocturnall” as one in which life is “Dead and enterr’d” follows from his belief that “all earthly life is but a form of death” (Roberts 963). This belief, in turn, is rooted in his negative evaluation of change:

\textsuperscript{25} See, for example, Welch’s existentialist interpretation of the setting in “A nocturnall.”
So for that beeing which he [man] seemes to have here now, it is a
continuall declination into a not being, because he is in continuall
change, and mutation, *qua desinit in non esse*, as he saies well; Every
change and mutation bends to a not beeing, because in every change, it
comes to a not being that which it was before; *(Sermons 8:145)*

In sum, since life in this world entails constant change, and since Donne considered
change as a “declination into a not being” from a higher state of being, Donne viewed
existence itself as a process of decay\(^{26}\) fundamentally continuous with the decay that
characterizes death and internment: “[. . .] this whole world is but an *universall church-
yard*, but our *common grave*; and the life and motion that the greatest persons have in

\(^{26}\) Such a view of universal decay has been rightly described as inimical to the scientific
spirit: “Probably more fundamentally dangerous [than the idea of the world’s end] to
science was that other idea…that nature and human capacity were irreversibly
decaying…. The universe was running down, and man with it. Therefore men of the
recent might inherit the scientific and other achievements of their forefathers but could
not hope to equal them” (Kocher 82; Kocher traces the idea of universal decay back to
Psalm 102, and Augustine). As Kocher goes on to note, “the new science played major
part in the dissipation of the whole theory of decay at the end of the seventeenth
century and the beginning of the eighteenth.” But if the analysis presented in this
dissertation is correct, it was not that this world-view declined because the new
science’s “findings swept away the putative evidence” for it (89), but rather, that the
new science was itself based on a different and incompatible worldview.
it, is but as the shaking of buried bodies in their graves by an earth-quake” (Sermons 10:234). 27

The nature of life in “A nocturnall” is further elaborated in the third stanza, where the speaker, although no longer part of such life, reminisces about a time when he was, a time when he and his now-deceased lover shared the same type of interdependent existence as “all others” still do. Observing that “All others, from all things, draw all that’s good, / Life, soule, forme, spirit, whence they beeing have” (19-20), the speaker remembers that he and his lover drew precisely these same attributes of “beeing”—specifically, life, soul, and form—from one another. The speaker remembers that he and his lover depended on each other for both soul and life, recalling that “[. . .] absences / Withdrew our soules, and made us carcasses” (26-27); he also remembers that he and his lover depended each other for form, recalling that each devolved into the formlessness that is chaos when deprived of the other’s attention: “[. . .] oft did we grow / To be two Chaosses, when we did show / Care to ought else;” (24-26).

Although the speaker portrays the relationship he and his lover shared and the relationships shared by “all others” in terms of the same attributes of being, thereby

27 This idea of life as a process of decay has a long history, and can be found in St. Augustine: “For no sooner do we begin to live in this dying body, than we begin to move ceaselessly towards death. For in the whole course of this life (if life we must call it) its mutability tends towards death” (City of God xiii.419). As City of God’s translator, Marcus Dodd, observes, this sentiment can be traced back even further, and that “Much of [Augustine’s] paradoxical statement about death is taken from Seneca.”
emphasizing the relationships’ fundamental similarity, there is a crucial difference. While he portrays the relationships of others in terms of *being* (life, soul, and form), the speaker portrays his and his lover’s relationship in terms of *loss of being* (loss of life, soul, and form). This difference is explained by the two lines that separate the portrayals, lines in which the speaker introduces his own relationship as an alembic: “I, by love’s limbecke, am the grave / Of all, that’s nothing” (21-22). An alembic is a flask used in alchemy to hold a material as it is distilled to its essential nature. The speaker goes on to portray his relationship in accordance with this introduction, showing that within this relationship “limbecke” he lost being as he was distilled to the essential non-being (“the grave / Of all, that’s nothing”) that is the foundation of all life in the world. He thus shows that the essential nature of the being enjoyed by the others is the loss of being suffered by the speaker and his lover, thereby vividly illustrating the principle which, as noted earlier, underlies life in the “nocturnall’s” world—namely, that all “beeing” is in fact a “declination into a not being.”

Although his love relationship distilled the speaker to the non-being that Donne believed to be the essential nature of all being in this world, he was not distilled to complete non-being while his lover was alive. The loss of being caused by his lover’s parting would be reversed (partially\textsuperscript{28}) by her return—although only to be lost again

\textsuperscript{28} Even the relative gains in being are changes in being and thus are, according to Donne’s view of change presented earlier, in fact losses of being. As Guibbory notes, “Occasionally [Donne’s] description of the temporal process implies that growth precedes decay […]]. Most frequently, however, Donne suggests that decline is
with her next departure. Accordingly, it was not until his lover’s death that the speaker descends into the profound state of non-being which is ruin: “From dull privations, and leane emptinesse / He [love] ruin’d mee” (16-17).

Thus far the speaker in “A nocturnall” has undergone a conventional alchemical reduction and lies in a “ruin’d” state analogous to the “massa confusa or alchemical chaos” to which alchemy reduces materials prior to their resurrection. And, indeed, the speaker is “re-begot” (17). The method and result of this rebegetting, however, belong not to a traditional form of alchemy but to “love[’s…] new Alchimie” (13). In fact, as we will see next, this new alchemy of love defines itself against the Christian continuous” (72). The fact that Donne viewed all change to be a real and irreversible “declination into a not being” is important when considering criticism that supports an argument for the speaker’s spiritual renewal with the notion of cyclical renewal. For example, Sleight maintains that, because the speaker “has attached his feelings of despair to the symbol of temporary decline in nature, there is good reason to suppose that despair will inevitably turn into new life, just as spring must return after winter, just as the longest night must give place to day” (39). However, as we have just seen, Donne viewed even apparently cyclical change as not “temporary” but rather as a real and irreversible “declination into a not being.”

29 I borrow these terms from Stanton Linden’s description of the similarly “ruined” speaker of Donne’s “The Litanie” (105).
form of alchemy familiar to Donne and his contemporaries.\textsuperscript{30}

The practice of expressing Christian belief through alchemical tropes reached its fullest development in the sixteenth and seventeenth centuries, during which period its core elements, in substance if not precise detail, were well established and widespread.\textsuperscript{31} With regard to death and resurrection, alchemy’s expression of Christian belief was predicated on a shared view of creation and re-creation. In the following passage from one of his sermons, Donne introduces this cosmogony in its Christian form: “At this time, of which this Text [Gen. 1:2] is spoken, The waters enwrapped all the whole substance, the whole matter, of which all things were to be created [. . . ] And so the holy Ghost moving, and resting upon the face of the waters, moved, and rested, did his office upon the whole Masse of the world, and so produced all that was produced” (\textit{Sermons} 9:99). This account of creation is consistent with alchemy’s basic cosmogony, in which creation began with a “formless, universal substrate” (Ritchie 99)—in Donne’s account, the “Masse”—out of which all things were created by being “informed, transformed or animated by soul or spirit” (Ritchie 100)—in Donne’s account, the “holy Ghost.” The degree to which the “substrate” has been “informed,

\textsuperscript{30} While alchemy’s ties to spirituality date from antiquity, the use of alchemical figures to express specifically Christian content began with alchemy’s revitalization in the West during the Middle Ages. Useful discussions of Christian alchemy and its history include those by Ganzenmüller, Jung, Linden, and Shumaker.

\textsuperscript{31} The longevity and popularity of the analogy between Christ and the elixir, the analogy central to “A nocturnall,” is well documented by Jung and Linden.
transformed or animated by soul or spirit” varies with each type of creature, resulting in a hierarchy of being. At the top of the hierarchy is the “soul or spirit” itself—in Christian terms, God as the sovereign source of being.\(^\text{32}\) At the low end of the hierarchy is the “universal substrate,” identified with non-being.\(^\text{33}\) Between these two extremes is any number of levels of being, depending on how one categorizes them. Donne, following convention, categorized them into the four ascending levels of “stone, plant, beast and man.”\(^\text{34}\)

\(^{32}\) As Brunn has observed, the notion of being belongs to “a long history of attempts to explain contingent existence by reference to a necessary ground […] a self-sufficient, perfect, unchanging, and eternal something, identified with the Good or God” (40).

\(^{33}\) Although Christian monotheism necessitates that the substrate be “existentially caused” by God and thus not be inherently evil, the substrate’s defining characteristic of mutability ensured its abiding association with sin in Christian thought. St. Augustine, for example, “characterizes this material element by formlessness, itself defined as absolute mutability […] He especially insists on the negative aspect of this [mutability], on its unlikeness to God, due to the nothingness from which it is drawn […] If it is not bad in itself, at least it is potentially evil, to the extent to which it tends to nothingness” (75).

See also Donne, *Sermons* 1:289.

\(^{34}\) Donne writes: “And then man, (considered in nature) is otherwise the nearest representation of God too. For the steppes, which we consider are four; First, *Esse*, Beeing; for some things have onely a beeing, and no life, as stones: Secondly, *Vivere*, Living; for some things have life, and no sense, as Plants: and then, thirdly, *Sentire*,
Although at the top of the earthly hierarchy of being, and thus “in a nearer station to God, than any other creature, and a livelier Image of him, who is the root of Beeing, then all they” (Sermons 9:82), man is still created from the substrate, which means that he shares with all created things the tendency to devolve back into universal formlessness:

This is Natures nest of Boxes; The Heavens containe the Earth, the Earth, Cities, Cities, Men. And all these are Concentrique; the common center to them all, is decay, ruine; only […] that which was not made of Nothing [i.e., God], is not threatened with this annihilation. All other things are; even Angels, even our soules; they move upon the same poles, they bend to the same Center; and if they were not made immortall by preservation, their Nature could not keepe them from sinking to this center, Annihilation.

(Devotions 51)

Despite this natural tendency of all created things to devolve back to the universal substrate, God originally intended to maintain man forever in the original, full being given him at creation. Sin reversed this intention: “Original sinne hath induced this corruption and incineration upon us; If wee had not sinned in Adam,

Sense; for some things have sense, and no understanding. Which understanding and reason, man hath with his Beeing, and Life, and Sense; and so is in a nearer station to God, than any other creature, and a livelier Image of him, who is the root of Beeing, then all they, because man onely hath all the declarations of Beeing” (Sermons 9:82).
immortality had not put on mortality, (as the Apostle speakes) nor incorruption had not put on corruption, but we had had our transmigration from this to the other world, without any mortality, any corruption at all” (Sermons 10:236).

Having “sinned in Adam,” man is now subject to a lifelong process of decay that begins at conception. As Donne observes with regard to himself, “I am dead, I was borne dead, and from the first laying of these mud-walls in my conception, they have moldred away, and the whole course of life is but an active death” (Devotions 96).

Although humankind is now destined to devolve into a state of physical and spiritual non-being, for Donne this did not mean all was lost. On the contrary, he believed that “that death who destroys me, re-edifies me: Mors veluti medium excogitata, ut de integro restauraretur homo: man was fallen, and God took that way to raise him” (Sermons 4:126). Donne speaks here of Christian resurrection, but the belief that death is the way to life underlies alchemical resurrection as well. This belief is supported by the basic cosmological and ontological principles shared by Christianity and alchemy as already outlined. Since in both systems all things are created by a common substance, it follows that in both, if that substance can be withdrawn from the particular form/species than it can be made into more perfect form (Atwood 73). In other words, if a material can be brought to the state of non-being from which it was originally created, then it can be re-created, or resurrected, to an even “more perfect form,” a higher level of being (lead into gold, for example). Christian resurrection, as Donne remarks to his parishioners, constitutes an analogous process: “Thou that
wast once nothing, was made this that thou art now; and when thou shalt be
nothing againe, thou shalt be made better than thou are yet” (Sermons 3:97).

As we saw above, the speaker in “A nocturnall” was reduced to a state of spiritual
ruin following his beloved’s death.35 He elaborates on this state by observing that he is
not man, beast, plant or stone (30-34);36 in other words, he belongs to none of the four
levels of being that conventionally constitute creation. Having thus devolved spiritually

35 Although man’s decay is a continual process set in motion at conception, life in this
world provides innumerable catalysts, among them grief, that quicken and intensify this
process. Donne mentions a few of these “infinite ways by which man arrives at ruin”
(Devotions 46) in his remark that “in our quickning in our mothers womb, wee become
guilty of Adams sin done 6000 years before, and subject to all those arrows, Hunger,
Labour, Grief, Sicknesse, and Death, which have been shot after it” (Sermons 2:59).

36 “Were I a man, that I were one,//I needs must know, I should preferre,//If I were any
beast,//Some ends, some means; Yea plants, yea stones detest,//And love, all, all some
properties invest//....//But I am none...” (30-34, 37). Concerning this passage, Sleight
comments that “paradoxically it is the beasts and stones who are personified, they ‘detest
and love’” (36). However, this paradox, like others in “A nocturnall,” is resolved when
interpreted in terms of the worldview outlined here, according to which “there is no such
thing as mere lifeless inert matter” since “for anything to come into existence and possess
any definite character it must be in some degree informed, transformed, or animated by
soul or spirit” (Ritchie 100). The animistic representation of “beasts and stones” is thus
literal, not figurative.
into the complete non-being of the substrate, the speaker is poised to undergo spiritual resurrection—to be restored to the top of creation as man redeemed, “the child of God, and [...] artaker of the divine nature it selfe.”

The speaker, however, does not undergo such resurrection. In fact, he implicitly refuses to do so. While death is the way to life in both alchemy and Christianity, it is so in both only by means of an elixir. In alchemy, the elixir imparts being to a ruined material, thereby resurrecting it. In Christianity, God is the sovereign source of being and thus the only true elixir. The speaker’s reference in “A nocturnall” to his deceased beloved as a “Sunne” that will not renew (38) recalls God, specifically Christ, in his function as elixir. In keeping with the conventional identification of being with light, Christ is often figured as the divine sun/son who does renew (both himself and others) through resurrection. In “A nocturnall,” however, the speaker does not turn from his

37 This is excerpted from Donne’s characterization of spiritual resurrection as taking the man who has devolved to an “ignobler creatur[e ... ] a licentious Goat, a supplanting Fox, an usurious Wolfe, an ambitious lion” and reforming him as “The child of God, and [...] artaker of the Divine Nature it selfe” (Sermons 7:135).

38 The speaker in “The Litanie” calls on God in His function as “elixir” when he asks God to “come / And re-create mee, now growne ruinous:” (3-4).

39 Donne often uses this conventional figure. For example, “And instead of that Sun, which this world had, a Sun from God; man hath had the Son of God; God hath spoken to us by his Son; God hath shin’d upon us in his Son. The whole work of Almighty God, in
own extinguished “Sunne” to this “divine sunne of God [who] never sets” (Guibbor 97). Instead, displaying to his beloved in death the same exclusive devotion he showed her in life, the speaker refuses to acknowledge a sun, or source of light and being, greater than she. Accordingly, the speaker immediately follows his acknowledgement that his “Sunne” will not renew with the lines, “You lovers, for whose sake, the lesser Sunne / At this time to the Goat is runne” (38-39; my emphasis), thereby placing his lover in Christ’s conventional position as the sun greater than the eponymous planet. 40 Rather than turning towards the “divine sunne of God” and being resurrected into a state of full being and light, the speaker remains in the absolute non-being and darkness in which the setting

the Conversion of man [i.e. spiritual resurrection], is many times expressed by this act of shining; an effectual, a powerful shining” (Sermons 4:104-105).

40 This positioning of the lover in “A nocturnall” must be differentiated from the reference to Elizabeth Drury as the “Sunnes Sunne” in “The Second Anniversary” (4). The latter is portrayed as an instrument of God’s light and being whose example facilitates the spiritual resurrection of others. As “The Second Anniversary” makes very clear, any power Elizabeth has as a “sunne” is derived from God; she is merely the conduit for His being and light (518-528). The deceased lover in “A nocturnall,” on the other hand, is emphatically not an instrument of God’s being who facilitates the spiritual resurrection of others. She is a sun that will not renew, and the speaker’s devotion to her, far from facilitating his spiritual resurrection, in fact prevents it.
of his human "Sunne" has left him: the midnight of S. Lucies, in which hour the entire poem takes place. 41

Although the speaker does not turn to God and undergo conventional spiritual resurrection,42 he has not remained in a state of simple loss either; rather than remaining "an ordinary nothing,"43 he has "[o]f the first nothing, the Elixer

41 As the darkest hour of the year’s longest night, the midnight of S. Lucies signifies not a unit of time so much as the metaphysical state of complete non-being in which the speaker was left by his beloved’s death and on which, as we will see, he has since re-created himself. The primacy of the term’s metaphysical over its temporal significance is supported by its appearance in both the opening and closing stanzas of the poem—a repetition that gives the impression not of signifying flowing time but of circumscribing an area, establishing a position, for the poem’s speaker and his speech. Donne often uses specific time-periods for their metaphysical significance; of particular interest is his use of both “midnight” and “S. Lucie’s” to characterize the state of the unresurrected soul in Sermons 9:367.

42 As Brunn observes, in Augustine’s dialogues “the soul’s life is defined as being (esse) or nonbeing (non esse) according to whether it turns towards God-Being or, on the contrary, towards the nothingness of the outside world” (101).

43 "If I an ordinary nothing were.//As shadow, a light, and body must be here.//But I am none;..." (35-37). The “ordinary nothing” to which the speaker here refers is the concept of nothing as it is defined in the “ordinary” (i.e., conventional) worldview so clearly evoked in the immediately preceding lines (30-34). Non-being in this metaphysics is
grown” (29). In other words, having lost all being and returned to the substrate, the “first nothing,” the speaker continued his distillation until emerging as his own “Elixir,” his own agent of resurrection:

For I am every dead thing,

In whom love wrought new Alchimie.

For his art did expresse

defined as merely a privation of, or declination from, being. Here, as in so many other instances (see, for example, Sermons 6:2 38 and 7:360), Donne uses the figure of a shadow to convey the fully dependent nature of such non-being on being. As the elixir of the “first nothing,” the speaker claims to ground his own existence, independently of being.

The terms “substrate” and “first nothing” are not synonyms, and Donne’s use here of the latter term rather than the former has important implications. As we saw earlier, the “substrate” is the matter or non-being from which all things were created and to which all created things naturally decline. The “first nothing” also refers to such matter or non-being, but as it “preceded God’s first act of creation” (Grierson 38; see also Sermons 1:289). In other words, whereas “substrate” refers to non-being as it exists relative to God’s act of creation and the being expressed therein, the “first nothing” refers to non-being as it exists independent of—figuratively (since time is a corollary of creation) “preced[ing]”—these. And indeed, as we will see next, the “nocturnall’s” speaker claims to have re-created himself on the basis of phenomena that were not created by God and that therefore do not participate in being.
A quintessence even from nothingnesse,

From dull privations, and leane emptinesse,

He ruin'd mee, and I am re-begot

Of absence, darknesse, death; things which are not. (12-18)

This is a “new Alchimie” indeed. Turning to no exterior source of power, no elixir of being, the speaker is resurrected by his own power—the power “inherent and resident” within himself,\(^{45}\) which, as a creature of this world, is non-being. The speaker is “re-begot / Of absence, darknesse, death; things which are not” (17-18).\(^{46}\)

These “things which are not”—“absence, darknesse, death”—upon which the speaker is “re-begot” are not in the sense that they were not given being by God, the sole source of being. They, like all “ill things, are no things […] for, whatsoever is any thing, was made by God, and ill, sin, is no creature of his making” (Sermons 2:99). Although such “things which are not” do not have ontological reality, they do have overwhelming human reality, for they comprise the “declination into a not being” characteristic of man’s life in this world. A Donne observes, “That will not ease my soul, no more then it will ease my body,

\(^{45}\) The speaker’s resurrection in “A nocturnall” is a strict inversion of Christ’s resurrection as Donne presents it, for example, in Sermons 4:69 and 7:100.

\(^{46}\) These two lines that appear to assert the illogical production of something from nothing, a paradox resolved when viewed from the perspective of the ontology outlined here, have consistently eluded explication (see, for example, Kermode 22).
that *sicknesse* is nothing, and *death* is nothing [. . .]. [For s]in is so far from being nothing, as that there is nothing else but sin in us: sin hath not onely a place, but a Palace, a Throne, not onely a beeing, but a dominion, even in our best actions” *(Sermons 2:99-100).*

While these “things which are not” may have “a Palace, a Throne [. . .] a dominion” in this world, they have no place in the next, for Christian resurrection was instituted precisely in order to overcome the “declination into a not being” brought into God’s creation through sin.47 In the final resurrection God will destroy this privative world in fact:

> And that as thou hatest sinne it selfe, thy hate to sinne may bee expressed in the abolishing of all instruments of sinne, The allurements of this world, and the world it selfe; and all the temporarie revenges of sinne, the stings of sicknesse and of death; and all the castles, and prisons, and monuments of sinne, in the grave. That time may bee swallowed up in Eternitie, and hope swallowed in possession, and ends swallowed in infinitenesse, and all men ordained to salvation, in body and soule, be one intire and everlasting sacrifice to thee...

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47 As Brunn observes with regard to the metaphysics underlying Christian resurrection, “everything, in this metaphysics must...be converted to being. It is especially true as regards the spiritual created being, but also, analogically, as regards the human body, and as regards the *entire temporal universe*” (74; my emphasis).
(Devotions 96-97)

In spiritual resurrection an analogous destruction of this privative world must happen, only it must happen within the soul of the resurrected. The speaker of Donne’s “The Second Anniversary,” for example, commands his soul to undergo resurrection:

Then, soule, to thy first pitch worke up againe;

Know that all lines which circles doe containe,

For once that they the center touch, do touch

Twice the circumference; and be thou such.

Double on Heaven, thy thoughts on Earth emploidy

[..................................................]

This is esentiall joy, where neither hee

Can suffer Diminution, nor wee; (435-440, 443-444)

48 I believe Butler is incorrect in interpreting the pessimistic view of the natural world presented in Donne’s “First Anniversary” as stemming from a skepticism born of the Scientific Revolution, the view presented being “directed not against the basic assumption of harmonious world order, but against the confusions produced by the newly assimilated Copernican world scheme” (117). While Donne did believe in a natural world order, for Donne that order was ontologically disturbed by original sin, not empirically disturbed by Copernicus. Kocher is much closer to the mark when he writes: “In the Second Anniversary… man’s ignorance in this world is given skeptical origins in the corruption of his reason and senses coming from original sin” (59-60).
Here the speaker commands his soul to “the first pitch worke up againe”—that is, to regain its original, full being—and dwell in the divine realm of immutable being “where neither hee [God] / Can suffer Diminution, nor wee.”49 In order to do so, however, the soul must first forsake this world, which is exactly what the speaker has ordered it to do:

Forget this rotten world; And unto thee,
Let thine owne times as an old story be,
Be not concern‘d: study not why, nor whan;
Doe not so much, as not beleeve a man.
For though to erre, be worst, to try truths forth,
Is far more busines, then this world is worth.
The World is but a Carkas; [...] (49-55)

We see, then, that the speaker in “A nocturnall” bases his resurrection on precisely that which is forsaken and abolished in Christian resurrection: this world and man’s existence in it. Whereas his counterpart in “The Second Anniversary” must “Forget this rotten [...] Carkas” of a world in order to undergo Christian spiritual resurrection, the speaker in “A nocturnall” dedicates himself fully to the remembrance

49 Immutability is the defining characteristic of the divine nature and the resurrected state that shares in it; as Brunn observes with regard to St. Augustine’s understanding of spiritual resurrection: “[T]he soul is constituted in being thanks to a formatio that is also a reformatio...[and] participates in its measure of immutability, which defines absolute Being, in contrast with contingent being” (72).
and commemoration of this very same “Carkas” of a world and is spiritually resurrected as its “Epitaph:”

The worlds whole sap is sunke:

The generall balme th’hydroptique earth hath drunk,

Whither, as to the beds-feet life is shrunk,

Dead and enterr’d, yet all these seeme to laugh,

Comparer’d with mee, who am their Epitaph” (5-9)\(^{50}\)

Rather than urging his listeners to look away from this world and towards the next, as is the case in “The Second Anniversary,” the speaker in “A nocturnall” focuses his listeners’ attention on this world. After introducing the “Dead and enterr’d” life of the world, and himself as its “Epitaph,” the speaker opens the second stanza by addressing those who wait for “the next world:” “Study me then, you who shall lovers bee / At the next world, that is, at the next Spring:” (10-11). Here, “the next world” is not the transcendent, immutable world of the divine; rather, it is only the cyclical renewal of this world—the return of the spring season and the rebirth of human love. Even after portraying in the third and fourth stanzas the pain and loss he suffered in loving another human being, the speaker does not counsel his listeners against such worldly love and transitory pleasure. Quite the contrary, he opens the final stanza by

\(^{50}\)”Epitaph” should be understood here not in the narrow sense of a written inscription placed over a personal grave but rather, in keeping with the poem’s depiction of the world as a common grave in which all life is “Dead and enterr’d,” as any speech devoted to commemorating life, such as it is.
enjoining his listeners to enjoy the “summer” of this world, “Since shee enjoyes her long nights festivall,” (42). Ultimately, the summer sun will set once more, and the “long nights festivall” of winter will return; time will claim what belongs to it, and the listeners will lose each other as surely as the speaker and his lover lost one another. However, the transitory nature of human love and the fair season in which it thrives is no reason to shun such love. On the contrary, the speaker’s use of “[s]ince” implies that it is precisely on account of love’s fragile nature and imminent loss that it should be valued so highly.

While the young lovers await the return of the sun for their season of love to begin, the speaker has nothing for which to wait. Unlike the sun, which will return from her “long night’s festivall,” the speaker’s “Sunne” will not. Accordingly, he adopts a different line of action, ordering himself to “prepare towards” his deceased lover, consecrating the present dark “houre”—that is, “the midnight of S. Lucies”—as the “eve” of his reunion with her in a darkness no less profound, the “long night’s festivall” of the grave.51 “Since shee enjoyes her long nights festivall, / Let mee prepare towards her, and let mee call / This houre her Vigill, and her eve, since this / Both the yeares, and the dayes deep midnight is” (42-45).

51 The “long nights festivall” in which the speaker prepares to join his lover is the same one that a very ill Donne wrote that he would soon be joining: “Therefore hast thou, O my God, made this sickness...my Eve, to this great festival, my dissolution [in the grave]” (Devotions 75-76).
Of all the sufferings to which one is subject during life in this world, the death of a loved one is perhaps the greatest. Christian spiritual resurrection takes such loss and turns it to gain by offering the bereaved a golden realm of pure, immutable being in exchange for this leaden world—a world in which even the greatest joys and most profound loves are adulterated by change and loss. This is indeed an exchange, for as lead is consumed in the process of making gold, so this world is abolished in realizing the next. The speaker in “A nothernall” does not respond to his beloved’s death by taking part in this exchange and undergoing Christian spiritual resurrection. Instead, he spirituall re-creates himself as the voice that affirms what this exchange negates—namely, man’s existence in this world, in all its darkness and non-being. This affirmation resounds in the speaker’s closing words: “midnight is.”
Chapter Two

The Order that Spans this World and the Next:
The Quincux in Thomas Browne’s “Garden of Cyrus”

In his preface letter to “The Garden of Cyrus, or, The Quincunciall, Lozenge, or Net-Work Plantations of the Ancients, Artificially, Naturally, Mystically Considered,” Browne explains his decision to publish “The Garden” as a companion piece to “Hydriotaphia, Urne-buriall,”\(^{52}\) noting: “That we conjoin these parts of different Subjects, or that this should succeed the other; Your judgment will admit without impute of incongruity; Since the delightfull World comes after death, and Paradise succeeds the Grave” (321). But while thus making it clear from the start that “The Garden” is in some way related to “the delightfull World...after death,” Browne is just as quick to point out that the relation between the two is not a simple one, and in fact chides as over-enthusiastic of “Garden Delights” (320) those who envision heaven itself to be a paradisical garden (and thus reflected in “The Garden’s” subject matter). In fact, as we will see, “The Garden” is not an image of, but rather, a precursor to the next.

“The Garden” is about order in general, and the “quincunciall order” in particular. Although Browne’s discussion ranges into all types of order, from color symmetry to

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\(^{52}\) These were the last writings Browne published during his life. Browne had previously published *Religio Medici* in 1643 and *Pseudodoxia Epidemica* in 1646, with revised editions of the latter appearing until 1672. Browne’s posthumously published works include: *Certain Miscellany Tracts* (1684); *A Letter to a Friend* (1690); *Posthumous Works* (1712); and *Christian Morals* (1716) (Patrides 18).
“Hieroglyphic signatures,”53 Browne focuses on the number 5 and its geometrical expression in the figure X. Browne outlines the parameters of this “quincunciall order” in his description of “The Garden’s” eponymous subject, Cyrus the Elder’s ancient garden, which had “five trees so set together, that a regular angularity, and through prospect, was left on every side, owing this name not only unto the Quintuple number of Trees, but the figure declaring that number. Which being doubled at the angle, makes up the Letter x, that is the Emphaticall decussion, or fundamentall figure” (328). Browne follows this definition very loosely; the “quincunciall order” encompassing a wide variety of figures that can be arrived at through manipulation of the original X—two of the most prevalent being the diagonal line or a “cutting across,” obtained by deleting one of the X’s lines, and the rhombus, obtained by connecting quincunxes (i.e., XX, the rhombus being formed between the two Xs).

“The Garden” shows “quincunciall forms and ordinations” existing not only in the products of man’s horticultural and practical arts, but throughout the natural world, from the heavens above, where lie “the single Quincunx of the Hyades upon the head of Taurus, and remarkable Cursero about the foot of the Centaur,” to the ground beneath, where lie “observable rudiments...[of the quincunx] in subterraneous concretions, and bodies in the Earth; in the Gypsum or Talcum Rhomboides, in the Favagnites or honeycomb-stone, in the Asteria and Astroites, and in the crucigerous stone of S. Iago of Gallicia” (343). Quincunxes are found not only at the extremes of visible creation, but

53 This dissertation’s fourth chapter explores similar signatures in the context of the 1665 plague.
fills its middle levels, with Browne finding them in the levels of plant, animal and human being.

The quincunciall order is especially prevalent in the vegetable realm. 54 "The Garden" locates such order in all aspects of vegetable structure, including "The Spongy leaves of some Sea-wracks," "the flowerly Branches in our best spread Verbascum" to "the trunk or neat Reticulate work in the codde of the Sachell palme." Indeed, this order is even found where one least expects it, such as in the "pendulous excrescencies of severall Trees" (344-346). 55 Not only is this order found in all aspects of vegetable structure, but also in all phases of vegetable life, from its very beginnings in seed to its full development in flower and fruit, from "the pricks, sockets, and impressions of the [Aritchoak's] seeds, in the pulp or bottome thereof" to "the flowers of Santfoyne, and French honey suckle" and "the rhomboidal protuberances in Pineapples" (344-346).

In addition to vegetable creation, "quincuncial forms and ordinations are also observable in animal figurations," including the decussation "observable in the belly of the Notonection, or water-Beetle, which swimmeth on its back, and the handsome Rhombusses of the Sea-poulte, or Weazell, on either side the spine" (356). Furthermore, as

54 This prevalence may have a basis in fact; as Schimmel notes: "five seems to be the most typical structuring in living nature, especially plants" (106).

55 That "excrencencies," which seem to be excessive of the plant's structure (rather than determined by it), are themselves structured bears testament to Browne's view of the natural world as a highly ordered, highly rational place.
is the case in vegetable creation, the quincunx characterizes not only various animal structures, but various phases of animal life as well.

But while evident throughout both vegetable and animal creation, the quincunx finds its most complete expression in man, who seems to be weaved according to this pattern to a higher degree than any other creature. As Browne observes, the quincunx forms man’s exterior as well as his interior: “The same is also observeable in some part of the skin of man, in habits of neat texture, and therefore not unaptly compared unto a Net...This Reticulate or Net-work was also considerable in the inward parts of man, not only from the first subtegmen or warp of his formation, but in the netty fibres of the veins and vessels of life...Nor is the same observable only in some parts, but in the whole body of man, which upon the extension of arms and legges, doth make out a square, whose intersection is at the genitals” (357-358). And as alluded to by Browne’s above comment that the quincunx is found “from the first subtegmen or warp of his formation,” the quincunx is found in various stages of human development, as we have seen it to be in various stages of plant and animal development.

Finally, the quincunx is a structuring principle not only of the individual creature, but of the creation as a whole. For it connects in intelligible relationships phenomena as apparently distant to one another as stars and moles:56 “That Augustus had native notes on his body and belly, after the order and number in the Starres of Charles

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56 It is such “bringing together” through intelligible relations rather than in space and time (abstractly considered) that Foucault terms “aemulatio,” or “ emulation,” in The Order of Things.
...wayne, will not seem strange unto astral Physiognomy, which accordingly consider the moles in the body of man” (362).

The above is a very small sampling of the quincuncial orders Browne presents in “The Garden.” But perhaps even such a relatively small sample will allow us to appreciate Samuel Johnson’s comment that Browne “finds his favourite figure in almost every thing...so that a reader, not watchful against the power of his infusions, would imagine that decussion was the great business of the world, and that nature and art had no other purpose to exemplify and imitate a Quincunx” (494). Indeed, Browne’s seemingly inexhaustible ability to find quincunxes in the natural world has led many to view “The Garden” as a trifling exercise in intellectual ingenuity, without deeper meaning. 57 Many critics accordingly dismiss “The Garden” in terms similar to those used by Walter Pater, who claims that Browne’s “chimeric fantasy carries him here into a kind of frivolousness” (140).

57 “The Garden of Cyrus is, I think, the least important of the works published in Browne’s lifetime; the subject is far less interesting, the thought less profound, and the composition less close-woven than in Religio Medici; he reveals less of himself, is less concerned to enlighten his reader, and has a less serious intention then in Pseudodoxia;” (Bennet 208). Given such a view, it is not surprising that “The Garden” has not received the critical attention it deserves.
While some critics have recognized "The Garden's" presentation of the quincunical order as informed by Pythagoreanism, its relationship to this important intellectual tradition has not been given serious or detailed treatment. Indeed, even such a keen explicator of Pythagoreanism as S. K. Heninger has written off its significance in "The Garden," contending that in this essay "Browne applied [the Pythagorean] notion of a geometrizing god so simplistically that he reduced creation to a gridwork of 'quincunxes,' of interlocking tetrads—what he called a 'Quincuncial Lozenge'" (210). On the contrary, a careful examination of "The Garden's" relation to Pythagoreanism, including that tradition's intellectual-historical association with realist metaphysics in general and Christian Neo-Platonic metaphysics in particular, shows that "The Garden's" quincunxes do not "reduce" nature to an abstract, meaningless "gridwork" of geometrical forms, but instead ennobles nature to a metaphysically-significant structure of real, operative forms.

58 As Collingwood notes, Pythagoreanism is not a well-defined body of doctrine traceable to one man: "Due to lack of written recordings, known mostly through Aristotle, who, when he came to write the history of Greek thought, he found himself unable to distinguish the ideas of Pythagoras from those of his followers, and equally unable to distinguish the ideas of his early followers from those of Pythagoras living at a much later date. To-day, in spite of hard work by many generations of scholars, 'Pythagoreanism' is little more than the name of a fluctuating and shapeless body of doctrine, some parts of which can be traced back as far as the fifth century B.C., others as far as the fourth, others not farther than the early centuries A.D." (49).
Throughout “The Garden,” Browne does not significantly differentiate between the number 5 and the figure formed by five points (X), and refers to both by the common term “quincunxiall order.” Indeed, Browne views the elder bush as an “epitome” of such order because the elder bush, like “The Garden’s” eponymous garden, displays this order in both ways, numerical and figural: “The white umbrella or medicall bush of Elder, is an Epitome of this order... arising [as it does] from five main stemms, Quincuncially disposed” (345; my emphasis). The Pythagorean concept of number was also fundamentally a figural one, in which a number was closely associated with, even defined by, a corresponding geometrical shape: “By number, the Pythagoreans meant...a form determined by an arrangement of points” (Heninger 71). This figural understanding of number is rooted in Pythagoreanism’s realist ontology. With regard to Pythagoreanism specifically, mathematical order in the natural world is not the effect of human intellect—for example, the effect of counting or measuring—but instead, is an objective reality, one that actually structures the world by providing things with their structure or form:59 “[t]he primary tenet of Pythagorean doctrine... [is] the belief that numbers are the ultimate constituents of reality” (Heninger 71).

59 The early Neo-Platonist Philo remarked on number’s independence from man’s intellect by arguing that “When a man understands it, it is not changed into a kind of nourishment for him; when he fails to grasp it, the truth of number does not disappear; rather, it remains true and permanent, while man’s failure to grasp it is commensurate with the extent of his error” (54).
But while mathematical order informs matter in both “The Garden” and Pythagoreanism, in neither is such order dependent on matter for its existence; ultimately, each element or “number” of such an order is a “pure form, uncreated and unchanging, nonphysical and atemporal…[that] can be used to define a limited portion of space…can even be used to impose shape upon matter. Then it receives physical extension into the time-space continuum and so becomes perceptible to our senses as well as to our intellect. By number strictly speaking, however, the Pythagoreans meant form in the abstract, divorced from matter” (Henniger 71). 60 In “The Garden,” these forms’ essential independence from the material they inform is evident in the operations that are carried out with regard to them independent of any corresponding operations in the material world. For example, Browne argues that “the Cylindrical figure of Trees is virtually contained and latent in this [quincuncial] order” by showing that the tree’s “Cylindrical figure” can be arrived at through transformations of an ideal “quincuncial order”—specifically, a parallelogram: “A Cylinder or long round being made by the conversion or

60 St. Augustine, whose adoption of certain Pythagorean tenets and devotion to number mysticism are well known, also emphasized the purely ideal (and therefore incorruptible) nature of mathematical order: “Whatever I may experience with my bodily senses, such as this air and earth and whatever corporeal matter they contain, I cannot know how long it will endure. But seven and three are ten, not only now, but forever. There has never been a time when seven and three were not ten, nor will there ever be a time when they are not ten. Therefore, I have said that the truth of number is incorruptible and common to all who think” (De Libero 54).
turning of a Parallelogram, and most handsomely by a long square” (372). Furthermore, there is the type of reversibility of operations that is acceptable in the logical and ideal realms that is rarely found in the material world; not only can Browne arrive at the tree’s cylindrical shape from a quincunciall order, as above, but he can also arrive at a quincunciall order from the tree’s cylindrical shape: “Now if for this order we affect coniferous and tapering Trees, particularly the Cypresse, which grows in a conical figure; we have found a Tree not only of great ornament, but in its Essentials of affinity unto this order. A solid Rhombus being made by the conversion of two Equicurrall Cones, as Archimedes hath defined’ (371).  

Given the Pythagorean treatment of mathematical order in “The Garden,” an initial connection between it and the afterworld presents itself—namely, the essay is the type of exercise advocated by Pythagoreanism (as well as other dualist Greek philosophies) to prepare one’s soul for its liberation to the eternal and ideal realm, the realm to which the soul essentially belongs, upon death: “Through philosophy we penetrate into that eternal world of ideas to which the soul belongs, and we free the soul

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61 Browne seems to view mathematical form in an even more ideal and transcendent way than is conventional. Mathematical objects are conventionally considered “intelligible particulars” “above sensible particulars, but below true universals” due to the fact that “there are many alike” (see Coplestone 157). Browne’s statement that since “every Rhombus containing four Angles equall unto four right, it virtually contains four right” (371), seems to posit a unique, truly universal “rhombus” (i.e., referred to above as “it”), independent of all particular rhombuses.
from the prison of the body. Death does no more than complete this liberation” (Cullmann 61). By apprehending the mathematical order that exists in the material world, man’s soul moves from the “corruptible to the eternal:” “For number is the most direct of all means for passing from ‘becoming’ to ‘being,’ from change and decay to permanence and immortality” (Bell 249). Furthermore, by meditation on such order, one’s rational soul enters into the wholly ideal realm to which it essentially belongs and will return upon the body’s death: “The philosopher, Plato asserts, must be a (Pythagorean) arithmetician. He should contemplate number till its inner nature is perceived only by the mind, and this he must do for the well-being of the soul itself…. Indeed number exists primarily so that the soul may ascend from the transitory to the timeless and share in the everlasting. Geometry also withdraws the soul from becoming to being and conditions it for participation in the Good. The real object of both is the knowledge; and that knowledge toward which arithmetic and geometry strive is not of perishable things, but of the eternal” (Bell 249).

The above understanding of death as characterized by an immortal, immutable soul fleeing a mortal, corruptible body is a Greek, not Christian view. In fact, such a view is fundamentally incompatible with Christianity’s doctrine of creation ex nihilo—in other words, the doctrine of “absolute creation, of a creative act which presupposes nothing at all, whether a pre-existing matter or a pre-existing form,” a doctrine that “originated with Christianity and constitutes the main characteristic differentiation distinguishing the Christian idea of creation from the Hellenic (and, for that matter, from the Hebrew) idea of it expounded in Genesis” (Collingwood 77). By insisting that God created all things out of nothing, and thus that all things have one, common ontological source (i.e., God),
Christianity rejects the ontological dualism so pervasive in ancient Greek philosophy. Furthermore, since this one source of all things is both benevolent and omnipotent, all things must have meaning and worth; as reported in “Genesis,” the creation was good.

In sum, the Christian doctrine of creation *ex nihilo* means that the Christian view of the afterlife cannot happily discard the human body (and, indeed, the entire material creation), as the Greek view had.\(^{62}\) Whereas dualistic Greek philosophies viewed death as the joyous liberation of the immaterial and immortal soul from the imprisonment that is life in this material world, in Christian philosophy death is “something dreadful, because the whole visible creation, including our body, is something wonderful, even if it is corrupted by sin and death. Behind the pessimistic interpretation of death stands the optimistic view of creation. Wherever, as in Platonism, death is thought of in terms of liberation, there the visible world is not recognized directly as God’s creation” (Cullmann 67).

But while Christianity’s doctrine of creation *ex nihilo* seems to necessitate a common fate for man’s body and soul,\(^{63}\) it was inevitable that Christian theology would be shaped by the Greek philosophy in whose context it emerged.

\( ^{62}\) The Greek doctrine of immortality [of the soul] and the Christian hope in the resurrection [of the entire man] differ so radically because Greek thought has such an entirely different interpretation of creation” (Cullmann 67).

\( ^{63}\) As noted above (fn 11), in the Christian cosmology the ontological divide exists not between immaterial and material (loosely, spiritual and physical), but instead between uncreated (i.e., God) and created (i.e., everything else).
here, it is Browne that most shows a “Gnostic tendency to dissolve Christian eschatology into the myth of the soul’s upward ascent and return to God” (Kelly 465). But while Browne does not find any place for man’s physical body in the next world, Browne’s view of the next world is radically Christian in that in this view the material creation has a positive and even necessary relationship to the next world, as opposed to the purely negative and coincidental one posited between the worlds in Greek philosophy.

In keeping with the material creation’s importance to Browne’s Christian understanding of resurrection, “The Garden” begins with the act of creation. Mixing ancient and Biblical myth, “The Garden” recounts: “That Vulcan gave arrows unto

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64 Although having its roots in third-century Gnosticism, such a tendency remains strong to this day: “Modern theologians often remark that the doctrine of the resurrection of the dead, clearly the sine qua non of orthodox Christian belief throughout the faith’s history, has been forgotten or misunderstood by almost the entire lay Christian community… The doctrine of the resurrection affirms two main events: Christ’s resurrection, by which life returned to his body after three days in the tomb: and the general resurrection, by which life returns to the bodies of all dead humans at the end of time” (Marti 311).

65 Greek views of creation will be discussed more in the next chapter. However, we may note here that the relationship between this world and a transcendent one is “negative” in Plato’s philosophy, in that Plato views this world as only a bad image of the transcendent one, and “coincidental” in Aristotle’s philosophy, in that while Aristotle views creation as striving towards the First Mover, such striving is de facto rather than a product of intention or design.
Apollo and Diana the fourth day after their Nativities, according to Gentile [i.e. pagan] Theology, may passe for no blinde apprehension of the Creation of the Sunne and Moon, in the work of the fourth day; When the diffused light contracted into Orbes, and shooting rayes of those Luminaries [Genesis 1.14 ff.]” (325). Browne rationalizes such mixing of pagan and Biblical references by appealing to the tradition of a prisca theologia, noting: “many conceive [Ovid] to have borrowed his description [of creation] from Moses.” (325). This notion of a prisca theologia, “of a pagan tradition of religious truth which derived from Moses” (Walker 15), originated with the work of “Philo Judaeus (c. 30 B.C. – 50 A.D.), an Alexandrian Jew...[who] attempted a reconciliation between Hellenistic and Jewish thought” (Butler 22).

A focus of Philo’s work, and of the entire prisca theologia tradition, was reconciling the “Mosaic account of creation in Genesis, and the Pythagorean-inspired,

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66 The Christian Neo-Platonist Marsilio Ficinio revitalized the prisca theologia tradition during the Renaissance, from which it passed to the seventeenth-century Cambridge Platonists, with whom Browne had much in common; “Theirs was a version of the syncretic Platonism of the Renaissance, for which Marsilio Ficino set the mould...[having] effected an accommodation between pagan philosophy and Christian theology by emphasizing parallels between the two and interesting these as evidence that ancient philosophy, especially Platonism, contained and conserved doctrines compatible with, and probably derived from, the revealed truth of the Bible” (Hutton 337).
number-symbolic account”\(^{67}\) of creation given in Plato’s *Timaeus* (Butler 22).\(^{68}\) Such reconciliation was greatly facilitated by the fact that the *Timaeus*, unlike previous Greek cosmologies, recognized a divine Creator.\(^{69}\) Due to the recognition of such a Creator-god, so central to Christian cosmology, Plato was often referred to in the *prisca theologia* tradition as the “Divine Philosopher”—precisely the same title that Browne refers to him in “The Garden’s” opening paragraph. And as we will see, Browne explicitly invokes the *Timaeus* later in “The Garden.”

As Butler has observed, the “great gain” to the Judaic-Christian tradition in reconciling its Biblical creation story to the *Timaeus* was that such reconciliation made “this created sensible world as in some way a reflection of an immanent intelligible order” (22). For according to the *Timaeus*, there is a “rational order of the cosmos,” an order grounded in an “intelligible world [that] is a presupposition of God’s creative act… the eternal and changeless model upon which God made the temporal and changing world of nature” (Collingwood 73). This notion of an “intelligible world” that contains the eternal, ideal forms of all things is inherently compatible with—indeed, in large part derived from—Pythagoreanism. As Heninger notes, Plato “adapted [the Pythagorean] theory of numbers as the foundation for his own famous theory of ideas. Numbers, forms,

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\(^{67}\) It is “through Plato’s writings, especially the *Timaeus*, [that] Pythagorean doctrine [entered] the mainstream of Greek thought” (Heninger 21).

\(^{68}\) For example, in *City of God* viii.11, St. Augustine argues that the similarities between the *Timaeus* and *Genesis* show Plato’s indebtedness to the Mosaic narrative.

\(^{69}\) The *Timaeus* was the “first Greek account of a divine creation” (Butler 11).
ideas—the basic assumption is the same...Ultimate reality is located in an intellectual world of forms rather than a physical world of matter” (Heninger 75).70 Plato did, however, deviate from Pythagorean teaching in that he did not view mathematical order, i.e., numerical and geometrical forms, to be the only forms expressed in material creation. For while “there is very little reference in Plato to Ideas other than Ideas of value and mathematical Ideas...[because] these are the Ideas he is most interested in...there is enough evidence...that he did in truth believe in an Idea answering to every common name” (Plato’s Theory of Ideas 79).71 In other words, Plato forwarded a realist

70 “Hence, when Socrates claimed that ethical concepts were even more intelligible than mathematical, and when he or his pupil Plato identified the ultimate nature of things with the concept of the good, the new movement of thought, though to some extent it diverted attention from mathematics, was philosophically no change at all, and that is why Aristotle, looking back over the history of Greek thought, could describe Plato as a Pythagorean” (Collingwood 55).

71 We will see in the next chapter how Boyle rejects such a realist ontology, in part by arguing that human language does not in fact refer to such essences and their entailed qualities as these exist independent of the human mind. Instead, “essences” are purely the effect of human subjectivity, being nothing other than the “quality or relation, or aggregate of qualities” that humans have agreed upon to be the “the denominating quality,” an agreement reflected in common names. Furthermore, this denominating “quality or relation, or aggregate of qualities” is itself a result of human subjectivity; such
ontology, in which "universals" (referred to by "common names") are real, and provide each created thing with an essence, or essential nature, that it shares with other creatures of its class.\textsuperscript{72}

But while Plato recognized more intelligible forms in creation than the mathematical ones recognized by the Pythagoreans, Plato did use Pythagorean number theory as the highest expression of his realist ontology.\textsuperscript{73} In the \textit{Timeaus}, for example,

\begin{quote}
secondary qualities are “in fact only our sensory organs’ empirical interactions with other bodies and not properties of the bodies themselves” (“Origin of Forms” 26).
\end{quote}

\textsuperscript{72} As Bell notes, Plato may not have been entirely at ease with his realist ontology: “As long as Plato ‘realized’ the abstractions of mathematics, aesthetics, ethics, and morals in Ideas he seems to have felt reasonably sure of himself and his realism. But when less pleasant things insisted on their metaphysical rights and also become copies of corresponding Eternal Ideas he began to hesitate. Intermediate between such innocuous Ideas as Equality and the sublimest of all—Truth, Beauty and the Good—were the Ideas corresponding to commonplace but unobjectionable things such as plants and animals” (265).

\textsuperscript{73} Plato’s subsuming his Ideas under a mathematical order may have been in part strategy to get others to accept the reality of such ideas. For as Bell notes, “To a mind eager to be convinced the most convincing of all Plato’s efforts to establish ‘the objective reality of universals’—like truth, virtue, love, man, knowledge, and so on—are those concerning the common notions of geometry and arithmetic” (260). In arguing for his own preference for mathematical order to express universals, Augustine points to that order’s
Plato presents numbers not as the actual ideas or forms according to which things are made, but rather, as categorizing principles of such ideas: “Plato’s assignment [in the Timaeus] of the number two both to the line and to science, of the number three both to the plane and to opinion, of the number four both the solid and to sensation, confirms the view we have reached on other grounds, that he did not, strictly speaking, identify the Ideas with numbers, but assigned numbers to Ideas, i.e., classified the Ideas as respectively monadic, dyadic, triadic, &c” (Theory of Ideas 220).

As mentioned above, the view that God’s act of creation was a creation ex nihilo, “a creative act which presupposes nothing at all, whether a pre-existing matter or a pre-existing form” (Collingwood, 77), is unique to Christianity. The Timaeus account, on the other hand, supposes both pre-existing matter and pre-existing form; the Timaeus’ creator is a demiurge who forms given matter in accordance with forms that exist independently of him.74 Thus, when reconciling Timaeus and Genesis, Christian adherents to the prisca purely intelligible nature: “the order and truth of numbers have nothing to do with bodily senses, but are unchangeable and true and common to all rational beings. Therefore, although many other things could occur to us that are common and, as it were, public for rational beings, things that are seen by each individual with his mind and reason and still remain inviolate and unchanged, nevertheless, I am not unwilling to accept the fact that the order and truth of numbers are the best possible examples” (De Libero 54).

74 The precise whereabouts of Plato’s Ideas is a moot topic, and perhaps, as Coplestone points out, not a crucial one: “the essence of the Platonic theory of Ideas is not to be sought in the notion of the ‘separate’ existence of universal realities, but in the belief that
*theologia* parted from the Platonic account by positing that God had created matter and that the forms were one with God; with regard to the latter, for example, Augustine "makes the ideas prototypes in the intellect of God. God has created everything after certain models—ideas. As an artist moulds his work to the pattern he has made in his soul, so does God create the world on the pattern he has made in his divine intellect" (Lyttkens 111). As is the case with Plato's Ideas, these "prototypes" provide creatures with their essential nature: "The created thing agrees with its prototype in the essence of God. This prototype can therefore be said to be the true and unchanging expression of the essence of the thing" (Lyttkens 111). Browne states this view that God's mind contains the "unchanging expression of the essence of things" with regard to man specifically, noting: "Time, which perfects some Things, imperfects also others. Could we intimately apprehend the Ideated man, and as he stood in the intellect of God upon the first exertion by Creation, we might more narrowly comprehend our present Degeneration, and how widely we are fallen from the pure Exemplar and idea of our nature" (*Christian Morals* 1.28).

As noted above, Browne explicitly invokes the *prisca theologia* tradition in defending "The Garden" opening's mixture of "Gentile [i.e., pagan] theology" and "Genesis" materials. This same tradition is also implicitly invoked in this same opening by its references to the "days of creation," a reference that implies the Christian adaptation of the *Timaeus* specifically. In reconciling "Genesis" with the *Timaeus*, the universal concepts have objective reference, and that the corresponding reality is of a higher order than sense-perception as such" (i.151).
prisca theologia tradition appealed to the former’s division of God’s act of creation into six days. It was argued that the “days of creation” do not signify temporal divisions in God’s act of creation, but rather, logical divisions in God’s model of creation: “a distinction in time of creatures divided in nature” (Pseudodoxia 264). Browne paraphrases this view in Religio Medici, observing that “Some believe there went not a minute to the world creation, nor shall there go to its destruction; those six dayes so punctually described, make not to them one moment, but rather seem to manifest the method and Idea of the great worke of the intellect of God, then the manner how hee proceeded in its operation” (Religio Medici 117).75

In this Christianized version of Platonic cosmology, mathematical order retained its position as the highest expression of the intelligible order found in creation—a position in retained from Augustine’ third-century explication of Wisdom 11:2076

75 This echoes the views of earlier prisca theologia adherents; for example, “According to Philo and Origen, the world was created instantaneously, but revealed to the angels and described to men in a succession of time” (Williams 43).

76 This famous Bible passage, in which God is said to have created all things by measure and number and weight, was interpreted by Augustine thus: “were these somewhere or other before the whole natural cosmos was created, or whether they too were created; and if they existed before hand, where were they? After all, before creation there was nothing except the creator. Therefore they were in him. But how? How are these identical with him?...In so far as measure sets a limit to everything, and number gives everything its specific form, and weight draws everything to rest and stability, he is the original, true
through Browne’s own citation of his near-contemporary, John Dee: “All things (which from the very first originall being of thinges, have bene framed and made) do appeare to be Formed by the reason of Numbers. For this was the principall example or patterne in the minde of the Creator” (Post 141; my emphasis).

Since in Christian philosophy the exemplars according to which things are created are one with God’s intellect, meditating on creation’s order has a specifically theistic significance that it did not have in the earlier Greek traditions: “Terms such as order (ordo) reason (ratio) and number (numerus) are sometimes used interchangeably, for all equate ephemeral realities to the divine, pre-existent plan (forma) and offer the means of harmonizing the human mind with the Creator and the rest of creation…in discovering form, one exercises the highest of his God-created rite—the grace of participation in the divine ratio” (Peck 17). One critic sees “The Garden” as a theistic version of Greek mysticism, by which the individual soul ascends to the realm of divine ideas: “To meditate on the numerological meaning of the quincunx is to approach more nearly the ‘ordainer of order’—to borrow Browne’s euphemism for God at the end of the essay” (Post 141). But while there are some instances in “The Garden” in which the quincunxes of creation lead Browne to ponder God directly—for example, when Browne asserts that the quincunxes apparent in man’s skin “Emphatically extend that Elegant expression of and unique measure which defines for all things their bounds, the number which forms all things, the weight which guides all things” (Literal Meaning of Genesis iv.3.7). Note that Augustine is careful to emphasize these orders’ oneness with God, thereby retaining creation ex nihilo.
Scripture, Thou has curiously embroidered me, thou hast wrought me up after the finest way of texture, and as it were with a Needle" (358). But for the most part, "The Garden" is not a soul’s escape from the material and temporal to the immaterial and eternal. Instead, as we see next, it is a soul’s attempt to encompass the material and temporal creation in praise of its Creator.

Having examined ways in which the quincunciall order is evident in the structure of various creatures of all types, some of which we sampled above, "The Garden" introduces a diachronic aspect to this order, showing its evidence in plant development: “The like [quincunciall order] is discoverable in the original production of plants, which first putting forth two leaves, those which succeed, bear not over each other, but shoot obliquely or crossewise, until the stalke appeareth; which sendeth not forth its first leaves without all order unto them” (347). Such ordered growth or “development implies an immaterial cause. If a seed is really developing into a plant, and not merely changing into it by pure chance owing to the random impact of suitable particles of matter from the outside, this development is controlled by something not material, namely the form of a plant, and of that specific plant, which is the Platonic idea of the plant as the formal cause of the full-grown plant and the final cause of the process by which the seed grows into it” (Collingwood 84). While this describes Aristotle’s view of development, Browne forwards a substantially similar view. For example, in the following passage from Pseudodoxia, Browne argues against the belief that bear cubs are born not fully formed, with their mothers’ tongues completing their forms after birth: “Men hereby doe in an high measure vilifie the workes of God, imputing that unto the tongue of a beast, which is the strangest artifice in all the acts of nature, that is, the formation of the Infant in the
womb, not only in mankind, but all viviparous animals.” Instead of such an external agent forming the matter from without, there is an internal agent forming the matter from within: “The plastick or formative faculty, from matter appearing Homogeneous, and of a similarly substance, erecteth Bones, Membranes, Veins and Arteries: and out of these contriveth every part in number, place and figure, according to the law of its species.

Which is so far from being fashioned by an outward agent, that once omitted or perverted by a slip of the inward Phidias, is not reducibly by any other whatsoever” (179). Here, Browne refers to the principle that guide’s the creature’s development as a “plastick or formative faculty” which, like Aristotle’s “immaterial cause,” is both a formal and final cause. Specifically, the “plastick or formative faculty” serves as both the cub’s formal cause—determining its structure, “every part’s...number, place and figure—and its final cause, directing the process through which this structure is realized, “contriving[ing]” these from “Bones, Membranes, Veins and Arteries.” Furthermore, Browne’s “plastick or formative faculty” expresses a Platonic idea77 in that it is a universal form, operating “according to the law of its species.”

77 Aristotle integrated the Platonic concept of form as structure with the actual life process of the creature, thus elevating temporal, material creation from being something other than a poor copy of an eternal, ideal form always out of reach. For Plato “the form that is immanent in perceptibles, the form that is a ‘logical universal,’ of which these perceptibles are instances or particulars, is not pure form, as pure form is understood by mathematical or ethical thought; it is only an approximation to that pure form. The structure of form which is ‘in’ natural things or in human actions, constitutes their
As implied in the above notion that the form “operates according to the law of its species,” this form is not only a formal and final cause, but an efficient one as well, this “form is an internal, structural principle striving to actualize itself as the fully mature individual,” whose “tendencies [of movement and growth are internal nisus possessed by [the natural object] in virtue of [its] specific form” (Companion to Aristotle 128). As in the above example of the cub, the “plastic or formative faculty” not only determines the cub’s structure and directs the realization of that structure in matter, but itself carries out this realization, “erecting” from homogeneous matter the cub’s “Bones, Membranes, Veins and Arteries,” etc.

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essence, and is the source of their general or special characteristics, is not the pure form itself, it is a tendency to approximate to this pure form... because they are never wholly successful, the transcendent form remains purely transcendent, and the immanent form remains a mere ‘imitation’ or approximation” (Collingworth 71)

78 “The form is the plan of structure considered as informing a particular product of nature... The final cause is the same plan considered as not yet embodied in the particular things but as aimed at by nature ... This formal-final cause is apparently also the efficient cause... in nature, the form which is to find fresh embodiment [in the individual entity] is already present and is the cause of movement” (Companion to Aristotle 74).

79 Browne at times tends towards pantheism by identifying the divine and mundane forms: “Yet is God the true and infallible cause of all, whose concourse though it be generall, yet doth it subdivide it selfe into the particular actions of every thing, and is that
But for all the similarities between the two, Browne’s view of form differs from Aristotle’s in at least one crucial way. Aristotle denied that such forms existed independent of the matter in which they were realized. Although Aristotle considered such forms to be eternal, this was not due to their basis in a realm transcendent of generation and corruption. Although Aristotle’s forms were eternal, they were eternal by virtue of the world itself being eternal (and uncreated). Rather than having an ontological basis different from the rest of material creation, the forms “are eternal [only] by reason of the never-failing succession of generations” (Ross 177). Aristotle’s wholly immanent view of forms is related to Aristotle’s view of God as creation’s “final cause only...the Unmoved mover is no world-ground; his nature and existence do not explain why the other things exist” (Lovejoy 55). The Christian Neo-Platonic God, on the other hand, is a “world ground,” whose ideas are the ontological basis of all creatures’ being. Due to their basis in such a realm transcendent of generation and corruption, the creatures’ forms of being have an existence ontologically distinct from the material world in which they are realized.

In sum, Browne merges Aristotelian and Platonic conceptions of form, presenting them as both real and operating in the material world while realizing an order that transcends that world. In contrast to “The Aristotelian God” who is not the world ground and who thus “does not know this world...no Divine plan is fulfilled in this world” (Coplestone i.319), Browne’s God is a world ground whose plan for creation, as

spirit, by which each singular essence not onely subsists, but performes its operation” (84).
expressed by the divine ideas, is fulfilled through the mediation of real, operating forms in nature: "every Essence...hath its finall cause, and some positive end both of its Essence and operation; this is the cause I grope after in the workes of nature, on this hanges the providence of God; to raise so beauteous a structure, as the world and the creatures thereof, was but his Art; but their sundry and divided operations with their predestinated ends, are from the treasury of his wisedom" (Religio Medici 1.14). The complex of such forms constituting "nature," which Browne defines as "that straight and regular line, that settled and constant course the wisdom of God hath ordained the actions of his creatures, according to their several kinds" (Religio Medici 1.16; 79; my emphasis). 80

Since the forms that constitute the natural world are based on those of the divine mind, these forms and their entailed processes of realization (i.e., life) have systematic, real relations to one another that they otherwise would not. Aristotle, for example, has no

80 Browne certainly has forerunners in this view, including Ficinio, for whom: "The origin of any motion is thus found in the essence of the moving thing; the end, in the perfection of that thing. These tendencies are called 'natural' because they are directly dependent upon the essence and common to all members of a species at all times. Further, as dependent upon essence, every natural tendency is ultimately related to God. The relation between particular good and the highest good and that between the order found in particular things and God as the one source of order illustrates the general ontological principle of primum in aliquo genere." (Renaissance Philosophy of Man 189).
basis on which to claim that the creatures of this world (including their ends, entailed as they are in their essences) are integrated in any rational way—and in fact, he does not do so: “The end of each species is internal to the species; its end is simply to be that kind of thing, or, more definitely, to grow and reproduce its kind, to have sensation, and to move, as freely and efficiently as the conditions of its existence—its habitat, for instance—allow. Only once, perhaps, does Aristotle suggest (and only doubtfully) that a characteristic of one species may be designed for the benefit of another” (125). In “The Garden,” on the other hand, natural phenomena are often related to one another, and always in a beneficial way. For example, “After this order hath Nature planted the Leaves in the Head of the common and prickled Artichoak; wherein the black and shining Flies do shelter themselves, when they retire from the purple Flower about it” (344).

Browne viewed creation in the same way we have seen Donne view it—namely, as a hierarchical system grounded in God’s rational being. Browne even used the traditional levels Donne used in portraying this hierarchy: “For there is in this Universe a Staire, or manifest Scale of creatures, rising not disorderly, or in confusion, but with a comely method and proportion: betwene creatures of mere existence [e.g., Donne’s “stone”] and things of life, there is a large disproportion of nature; between plants and animals or creatures of sense, a wider difference; between them and man, a farre greater” (101; my emphasis). “The Garden” implies this worldview from its opening account of creation, in which Browne remarks that “the vegetable creation” was made to benefit higher forms of life, being “the primitive food of animals, and first story of Physick, in Dietetical conservation [of man]” (325).
In keeping with this metaphysics, when the beneficial relationships that “The Garden” portrays as existing between creatures of various levels are not mutual, the benefit flows from the lower level of creation to the higher. Indeed, in “The Garden’s” fourth chapter, all things seem to be made with regard to the highest level of being in this world—namely, humanity. More specifically, all things seem to be made for human knowledge. After remarking that trees planted in a quincuncial order facilitate man’s sight by “direct[ing] the dispersed rayes of sight, and by this shade preserv[ing] a moderate light in the chamber of the eye,” as men themselves do when they “hollow their hand above their eye, and mak[e] an aritificall brow,” Browne goes on to claim that God provides a similar aid to man’s sight in his choice of the world’s colors: “And therefore providence hath arched and paved the great house of the world, with colours of mediocrity, that is, blew and green, above and below the sight, moderately terminating the acies of the eye. For most plants, though green above ground, maintain their Originall white below it” (373-374). Here, the green of plants is explained not in terms of the plants themselves (indeed, these ‘maintain their originall white below’ ground) but instead, by this coloring’s beneficial relationship to man’s sight; furthermore, this beneficial relationship is according to God’s plan, or “providence.”

81 This treatment of color shows the radical difference between Browne’s and Boyle’s very different views of nature and its relationship to man. Whereas Browne sees the God’s use of colors in creation as an objective expression of God’s concern for man, Boyle views such colors as “secondary qualities” that are, as we noted above, “only our sensory organs’ empirical interactions with other bodies and not properties of the bodies.
Browne goes on to discuss how God uses the quincuncial order in creation not only to ease man’s sight, but to structure sight itself: “It is no wonder that this Quincunciall order was first and still affected as gratefull unto the Eye: For all things are seen Quincuncially; For at the eye the Pyramidal rayes from the object, receive a decussion, and so strike a second base upon the Retina or hinder coat, the proper organ of vision” (376). In addition to structuring man’s sensory impressions, the quincunx structures man’s apprehension of these impressions: “And if ancient Anatomy would hold, a like disposition there was of the optick or visual nerves in the brain, wherein Antiquity conceived a concurrence by decussion” (376). The quincunciall order structures men’s sense-based knowledge even further, playing a role in both its understanding and remembering: “This [quincunciall order] is not only verified in the way of sence, but in animall and intellectual receptions. Things entering upon the intellect by a Pyramid from without, and thence into the memory by another from within, themselves” (“Origin of Forms” 26). Boyle’s use of “empirical” to describe these interactions is important, because it is indicative of the fact that “secondary qualities” have no necessary relation to man or his knowledge, but rather only a contingent or empirical one: “there are de facto in the world certain sensible and rational beings that we call men...[and] it is from the interaction of man’s sense’s primary qualities with those of external bodies that [secondary] qualities arise and are given names (“Origin of Forms” 23). Far from God having structured creation for man’s benefit, man appears here to be almost an afterthought in God’s creation.
the common decussation being in the understanding as is delivered by Bovillus" (377). Indeed, the crucial importance of the quincunx in man’s knowledge of this world is testified to by Browne’s speculation that insanity might be caused by the lack of this normative figure “in the Mathematicks of some brains:” “Whether the intellectual and phantastical [pertaining to vision] lines be not thus rightly disposed, but magnified and diminished, distorted, and ill placed in the Mathematicks of some brains, whereby they have irregular apprehensions of things, perverted notions, conceptions, and incurable hallucinations, were no unpleasant speculation” (377).

In sum, the quincunx not only symbolizes the forms that provide the natural world’s structure and development, but also structures man’s experience and knowledge of this world. In other words, the quincunx expresses not only each creature’s individual teleology, its development from a potential to actual individual of its species, but also each’s role in what might be termed a cosmic teleology. For Browne believed that the final cause or telos of the entire world is man’s knowledge of that world for the sake of praising its Creator.82 “That God made all things for Man, is in some sense true...God made all things for himself, and it is impossible he should make them for any other end

82 This closely echoes Aquinas’ view that “It is only rational creatures who can possess God by knowledge and love. Creatures have, of course, their proximate ends, the perfecting of their natures, but this perfecting of creatures’ natures is subordinate to the final end of all creation, the glory of God, the manifestation of His divine perfection, which is manifested precisely by the perfecting of creatures, so that the glory of God and the good of creatures are by no means antithetical ideas” (Coplestone ii.425).
than his own Glory; it is all he can receive, and all that is without himself. For, honour being an external adjunct, and in the honourer rather than in the person honoured, it was necessary to make a Creature, from whom he might receive this homage; and that is, in the other world, Angels, in this, Man; which when we neglect, we forget the very end of our Creation” (Religio Medici i.35). Whereas angels praise God in “the other world,” only man can praise God in this one: “The world was made to be inhabited by beasts, but studied and contemplated by man: ‘tis the debt of our reason wee owe unto God, and the homage we pay for not being beasts; without this the world is still as though it had not been, or as it was before the sixth day when as yet there was not a creature that could conceive, or say there was a world” (Religio Medici 75).

Man’s ability to honor the Creator through knowing material creation is based in man’s unique ontological position as that “amphibious piece betweene a corporal and spirituall essence, that middle frame that linkes those two together, and makes good the method of God and nature, that jumps not from extremes, but unites the incompatible distances by some middle and participating natures.” Man does not unite the temporal/material and eternal/spiritual realms because his body belongs to the former and his soul to the latter;\(^3\) on the contrary, man unites the material and spiritual realms because his soul participates in both. As the Renaissance Neo-Platonist Marsilio Ficinio remarks: “Such a nature seems to be completely necessary in the world’s order, in order

\[^3\text{In fact, as we will see in the next chapter’s consideration of Boyle, such a doctrine leads only to an ontological dualism that divides, rather than unites, the physical and spiritual realms.}\]
that, after God and angel, who cannot be divided according to time or dimension, but before body and qualities, which are dispersed in time and dimension, a harmonious mean may exist, a mean that may be divided in a way by sequential temporal activity but not divided in a way by dimension, and that may neither remain always gathered in a nature of its own like God and angels, nor be scattered about like the body and quality, but be undivided and divided equally... the soul is undivided, because it has a stable and unified substance; but it is divided, because in the course of its operation it is divided into many parts when it acts through movement and in time... divided in a way by sequential temporal activity” (Ficinio iii.2).

Following Ficinio, Browne identifies this “sequential temporal activity” of man’s soul with that of Plato’s world’s soul; adding his own touch, Browne identifies both with the quincunx: “Of this figure Plato made choice to illustrate the motion of the soul, both of the world and man; while he delivereth that God divided the whole conjunction lengthwise, according to the figure of a Greek X and then turning it about reflected it into a circle. By the circle implying the uniform motion of the first Orb, and by the right lines, the planetical and various motions within it...The circle declaring the motion of the indivisible soul, simple, according to the divinity of its nature, and returning into itself; the right lines respecting the motion pertaining unto sense, and vegetation, and the central decussation, the wonderous connexion of the severall faculties conjointly in one substance” (378).

With regard to the world soul, the “right line” consists of the “various motions” of that world. As we have seen, in Browne’s Christianized Platonism this “right line” of nature is “that straight and regular line, that settled and constant course the wisdom of
God hath ordained the actions of his creatures, according to their several kinds.” Man, of course, is one of God’s “creatures” and thus participates in this general “right-line” movement of nature, which includes “the powers of generation, nutrition, and sensation.”

But the soul’s (again, both the world’s and man’s) “right-line” movement is circumscribed by the soul’s return to its divine essence. As Ficinio remarks, the circular motion “is the most perfect of all motions...which is also the only sempiternal motion among motions. Others reach a limit beyond which they may not proceed, since nowhere is there infinite space. But circular motion, as it recurs once, so it recurs twice, three times, four times, and for the same reason; and in the circuit the end and the beginning are the same. Thus when it seems to be finishing, it is just beginning. Sempiternal circular motion, then, is proper to the [world and human souls] in so far as the essence is brought back in a circle to itself through motion” (iii.2.245).

Although the movement of the world’s soul is “right-lined” with regard to any particular creature, as a whole its motion is circular, in that it realizes in matter a closed system of transcendent forms. While “Nature is a development, i.e. the changing takes successive forms...in which each is the potentiality of its successor [, it] is not what we call ‘evolution,’ because...the kinds of change and of structure exhibited in the world of nature form an eternal repertory, and the items in the repertory are related logically, not temporally, among themselves. It follows that the change is in the last resort cyclical” (Collingwood 82).\textsuperscript{84}

\textsuperscript{84} In such a view, time is not fundamentally linear, with unique events producing irreversible history. Rather, time is “linear” only from the perspective of individual
The "right-lined" action of man's soul, which includes his sensory experience of the world, is circumscribed by that soul's return to the ideal realm—a return that is made possible by the action of discursive reasoning. Unlike other spiritual substances, i.e., God and angels, man's soul is subject to the "affection[s] of time, place, and motion." While this allows the soul to "give life to a body in time," it also means that man knows creature development; as Browne states this same idea: "The whole course of time run out in the Nativity and Death of Things" (395). Since there is no absolute linear progression to time, it has no internally generated endpoint. Instead, God must externally determine the world's end, and he does so "when all things are completed in it," i.e., when all potential forms have been realized. Accordingly, Browne cautions: "Let them not therefore complain of immaturitie that die about thirty, they fall but like the whole world, whose solid and well composed substance must not expect the duration and period of its constitution, when all things are completed in it, its age is accomplished...our ends are as obscure as our beginnings, the line of our dayes is drawne by night, and the various effects therein by a pencil that is invisible; wherein though we confesse our ignorance, I am sure we doe not erre, if wee say, it is the hand of God" (Religio Medici 114).

85 I borrow this term from Ficinio: "By the virtue of its central position, the soul of man is of a dual nature. With lower forms of life man shares the powers of generation, nutrition, and sensation, and these comprise the lower or irrational soul. The higher soul includes both the power of contemplation ("mind" in the strict sense), which man shares with the angels and God and the discursive power of reason which is peculiar to him alone" (Renaissance Philosophy of Man 145; my emphasis).
in a fundamentally temporal way. Browne contrasts man’s method of knowing through observing material operations with God’s method of knowing by an instantaneous intuiting of forms; God “lookes not on us through a derived ray, or a trajectory of a sensible species, but beholds the substance without the helpes of accidents, and the forms of things, as wee their operations” (Religio Medici 140-141; my emphasis). 86 Although man must know things through their accidents and operations, from these he comes to recognize their eternal essences: “Through his senses man can only obtain knowledge of individual things. True knowledge can only relate to what is general and universally applicable…true knowledge must relate to essentials and immutables which in the things are represented by their essences, out of the reach of the senses. They can only apprehend what is external and more temporary in the things—their accidents—and can therefore not penetrate to what decides their nature, their essence or essentia. Knowledge of this is obtained by studying and analyzing the sensory basis of knowledge, from which…a higher rational knowledge is obtainable. Another organ of knowledge than the

86 Browne differentiates between human and angelic knowledge in similar terms: “I believe they have an extemporary knowledge, and upon the first motion of their reason doe what we cannot without study or deliberation; that they know things by their formes, and define by specificall difference, what we describe by accidents and properties; and therefore probabilities to us may bee demonstrations unto them; that they have knowledge not onely of the specificall, but numericall formes of individuals, and understand by what reserved difference each since Hypostasis (besides the relation to its species) becomes its numericall selfe” (Religio Medici 122).
senses—the human reason—then begins to function; this is capable of extracting, abstracting, general concepts and truths from the sensory perceptions” (Lyttkens 195).87

It is this process of coming to know the eternal and intelligible through experience of the temporal and material that constitutes man's unique way of knowing “by a discursive process over time” (Ficinio ii.ii.243): “Just as matter, which is the lowest of natural things, can put on all corporeal forms and by this means become all corporeal things, so the intellect, which is, as it were, the lowest of all supernatural things and the highest of natural things, can take on the spiritual forms of all things and become all. In this manner the universe, under the concept of being and truth, is the object of the intellect” (Renaissance Philosophy of Man 199; my emphasis). Browne refers to this operation of the soul as the highest or “mysticall decussation” because in it nature reaches its final end—which, as we saw above, was to be understood by man to the Creator's honor, which it is when it is understood “under the concept of being and truth,” in other words, in relation to its ontological and rational ground, specifically, God's mind.

This certainly seems to be Browne's goal in “The Garden.” For as Browne makes clear in the preface to “A Garden,” he intends it to be an “epitome” of creation: “That in this Garden Discourse, we range into extraneous things, and many parts of Art and

87 Because man’s soul participates in the ideal realm, he can know and appreciate the world in a way that beasts cannot: “sense is satisfied with particular objects alone, whereas the familiar objects of the intellect are the universal and everlasting reasons of things. With these it could never become familiar unless it were in a peculiar way similar to them” (Renaissance Philosophy of Man 199).
Nature, we follow herein the example of old and new Plantations, wherein noble spirits contented not themselves with Trees, but by the attendance of Aviaries, Fish Ponds, and all variety of Animals, they made their gardens the Epitome of the earth, and some resemblance of the secular shows of old” (321). In other words, in “The Garden” Browne takes as his object the entire material creation, the end of that creation being fulfilled in Browne’s knowledge of it in its relation to the divine.

This process of knowing the material world that constitutes “The Garden” must eventually come to an end; as Browne writes in its closing paragraph: “But the Quincunx of Heaven runs low, and ‘tis time to close the five ports of knowledge” (387). The narrator tells others to continue on with such work—work that, as we have seen, is man’s purpose in this world while he lives. Yet, this is not man’s final end, and it is not where “The Garden” ends.

As we have seen throughout this essay, Browne viewed form as providing each creature its own end or telos. Furthermore, as rooted in God’s rational being, the forms and their entailed ends are integrated into one system of “nature,” which expresses God’s plan for his creation. In other words, each creature has not only its immediate end, to realize its own form, but also plays a role in a cosmic end—which, as we have seen, is to honor its Creator, which is accomplished by man’s knowledge of his creation. It is not only the rest of material creation that finds its perfection in man’s knowledge of it, but

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88 Not only does “The Garden” encompass the structure of creation, but its duration as well, beginning with the Creation and ending with discussion of the resurrection.
also man himself; to not engage in this process of knowing and praise is, as mentioned above, is to “forget the very end of our [man’s] Creation” (Religio Medici i.35).

In realizing this end—in other words, in knowing material creation to its Creator’s honor—man’s soul becomes a microcosm of creation: “the intellect is prompted by nature to comprehend the whole breadth of being; in its notion it perceives all and, in the notion of all, it contemplates itself...[it is] able to run discursively through the broad whole of being...the soul in its own way will become the whole universe” (Renaissance Philosophy of Man 200).

Yet, as noted above, such knowledge is not man’s final end; there is one further stage to man’s perfection as creation’s microcosm. We saw above that Browne viewed the creation hierarchically. And in keeping with his view that a creature’s form or essence not only provides its structure, but also determines its development, this hierarchy has a

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89 Indeed, man’s nature drives him to know the world in this manner: “It is clear also that the motion of plants originates from the powers of nutrition and generation and is terminate in the sufficient nourishment of the plant itself and reproduction of its kind...If other things do not wander upward and downward in a foolish accidental way but are directed according to a certain rational order toward something which is in the highest degree peculiar and appropriate to them and in which they are entirely perfected, then certainly mind, which is the receptacle of wisdom, which comprehends the order and ends of natural things...which is more perfect than all the others we have mentioned; mind, I say, must be directed in a far greater degree to some ordered end in which it is perfected” (Renaissance Philosophy of Man 197).
diachronic quality and, accordingly, so does man's form as microcosm: "To call our
selves a Microcosme, or little world, I thought it onely a pleasant trope of Rhetorick, till
my nearer judgment and second thoughts told me there was a reall truth therein; for first
wee are a rude masse, and in the ranke of creatures which onely are, and have a dull kind
of being, not yet privileged with life, or preferred to sense or reason; next we live the life
of plants, the life of animals, the life of men, and at last the life of spirits, running on in
one mysterious nature those five kinds of existence, which comprehend the creatures not
of the world, onely, but of the Universe" (Religio Medici 103). In other words, man not
only "possesses the ontological contents of inanimate things" but also realizes the
"perfection of vegetative, sensitive, and intellectual life" (Metaphysics of Being 233).  

For Browne, it is through death that man's nature as this world's microcosm
reaches its final perfection: "In that obscure world and wombe of our mother, our time is
short, computed by the Moone; yet longer than the dayes of many creatures that behold
the Sunne, our selves being not yet without life, sense, and reason, though for the
manifestation of its actions, it awaits the opportunity of objects; and seemes to live there
but in its roote and soule of vegetation; entering afterwards upon the scene of the world,
wee arise up and become another creature, performing the reasonable actions of man, and

90 "Man has the highest rank among visible things, as he possesses the ontological
contents of inanimate things as well as the perfection of vegetative, sensitive, and
intellectual life. This implies that man is the limit and the goal of all visible
creatures...the perfections and powers on a lower level are integrated in beings on a
higher level" (Metaphysics of Being 233).
obscurely manifesting that part of Divinity in us, but not in complement and perfection, 
till we have once more cast our secondine, that is, this slough of flesh, and are delivered 
into the last world, that is, that ineffable place of Paul, that proper ubi of spirits" (Religio 
Medici 110).91

While man perfects himself as microcosm as far as he can in this world by 
knowing it, his final perfection happens in the next world, where he exists as the material 
creation’s substantial microcosm: “Nor need we fear this term of annihilation or wonder 
that God will destroy the workes of his Creation: for man subsisting, who is, and will 
then truly appeare a Microcosme, the world cannot bee said to be destroyed. For the eyes 
of God, and perhaps also of our glorified senses, shall as really behold and contemplate 
the world in its Epitome or contracted essence, as now they doe at large and in its dilated 
substance. In the seed of a Plant to the eye of God, and to the understanding of man, 
there exist, though in an invisible way, the perfect leaves, flowers, and fruits thereof (for 
things that are in posse to the sense, are actually existent to the understanding). Thus God 
beholds all things, who contemplates as fully his workes in their Epitome, as in their full

91 Indeed, in keeping with the fact that alchemy means “to carry to its end something that 
has not yet been completed” (Debus 215), Browne refers to death itself as alchemy, in 
that it carries human nature to its end, or “perfection:” “I have therefore forsaken those 
strict definitions of Death…and have fram’d one in hermeticall way unto my owne 
fancie; est mutatio ultima, qua perfectur nobile illud extractum Microcosmi [i.e. death is 
the final change, by which that noble portion of the microcosm is perfected]” (Religio 
Medici 110).
volyme, and beheld as amply the whole world in that little compendium of the sixth day, as in the scattered and dilated pieces of those five before” (*Religio Medici* i.50).² It is by preparing for his final perfection in the next world that “The Garden” closes. Not coincidentally, the notion of man as creation’s microcosm or “quintessence” is, as implied in latter term itself, traditionally symbolized by the number five.³

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² This echoes Paracelsus’ view that while the last created man was the first intended:

“Der Geist Gottes redet in der Bibel und sagt, dass der Mensch das letzte Geschöpf ist. Das Letzte muss aber aus dem Ersten begriffen werden” (100).

³ “Man is anchored in two worlds—the visible and the invisible, the elemental and the celestial, the world of matter, which serves his body, and the world of action and power, which serves his spirit and mind. Man as a whole is a ‘fifth essence’ (Quinta essentia) extracted from both worlds and wrought into one being” (Pagel 65). The name of “quintessence” or fifth essence for a nature that comprehends the material world is due to the ancient Greek view that material creation consisted of four elements, or natures.
Chapter Three

Robert Boyle’s Mechanical Philosophy and the Closing of this World

Robert Boyle was a leader of the Scientific Revolution and, like so many other such leaders, a religious man whose theology informed his natural philosophy. He was a founding member of the Royal Society, whose “hallmark was a commitment to the Baconian ideal of empirical investigation…applied to a range of subjects that constituted what was emerging at the time as ‘science’ in a recognisably modern sense” (Enquiry xiii), and is the recognized father of modern chemistry, having displaced by his atomistic theory of matter the Aristotelian and Paracelsian theories on which chemistry’s precursor, alchemy, had been based.

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94 One need only point to the divine mathematics of Kepler’s astronomy, or the theistic conception of force in Newton’s physics. This overlapping of religion and natural knowledge is evident in “the early modern term ‘natural philosophy’ [, which] had a different extension than does the modern term ‘science,’ encompassing God’s creation of the world, his providential relationship with the creation and the immortality of the soul, along with the chemistry, physics, anatomy, and physiology that we would expect. Natural philosophers did not establish criteria of demarcation between these issues and what we consider genuine scientific concerns, but regarded them as inseparable” (Rethinking the Scientific Revolution 17).

95 The Scientific Revolution was in large part spurred by the reinvigoration of two ancient Greek intellectual traditions: the Pre-Socratic atomistic view of matter and the Pythagorean emphasis on mathematics in understanding the natural world. As Debus
notes in support of the latter, "certainly the new fascination with mathematics derives in part from the Renaissance Platonic-Pythagorean inspiration" (18). Such reinvigoration was in part due to a reaction against Aristotelian scholarship, Platonic and Pythagorean writings gained a new influence in many fields of learning, and scientific subjects were no exception" (Debus 18). Not only did this rejection of Aristotelian authority allow for the revitalization of less authoritative classical schools of thought, but it also provided the general impetus for empiricism and the associated experimental method: "Beginning in the Renaissance there was a new movement to reject traditional authorities, chief among whom was Aristotle, especially in his Christianized guise of scholastic philosophy. Instead of restricting learning to books and a priori reasoning, the new philosophy called for a renewed attention to the world of nature and to observation rather than ratiocination, this new empiricism providing the spiritual atmosphere which enabled science to develop" (Pagel 490). Yet, Aristotle’s rejection and its importance in the Scientific Revolution should not be overemphasized; “Despite the new philosophy’s call for the rejection of authority, Aristotle and his teachings remained an important force in the intellectual world...Indeed, Christianized Aristotelianism was still the basis of learning in the seventeenth century, with the scholastic commentaries on Aristotle remaining the basis for university curriculum (Enquiry xvii). Furthermore, Aristotle’s continuing influence was not necessarily a retarding force on natural philosophy; in fact, it played a crucial role in the work of William Harvey who, “by the discovery and scientific demonstration of the circulation of the blood, founded modern physiology and biology” (Pagel 498).
While "the most famous mechanical philosopher of his age" (Enquiry x), Boyle was also a "lay theologian," and in some of his "works theological concerns are so interwoven with his thoughts on natural philosophy that it is impossible to classify [them] as either primarily theological or primarily concerned with natural philosophy" (Wojcik 2). By design, Boyle's "Some physico-theological considerations about the possibility of the resurrection"97 belongs to this category of works "impossible to classify;" as Boyle states in its preface, he wrote "Some considerations" in order to reconcile Christian revelation with the corpuscular-mechanical philosophy. In doing so, he hoped to promote mutual respect among the adherents of each.98 "I hope some more ingenious than

96 Alchemy presupposed a vitalistic theory of matter, alchemy's practitioner being "called upon to assist the natural process towards perfection by removing the pure from the impure and allowing the seeds of things to attain their ends" (Rossi 4). Rejecting such a vitalistic theory, Boyle forwarded an atomistic and purely mechanical theory of matter, in which all change is determined by external, local motion rather than internal tendencies of growth or "perfection."

97 For the textual background of "Some considerations," including its relationship to unpublished writings by Boyle, see Wojcik 58.

98 As Wojcik has observed, in a number of Boyle's works, especially his Discourse of Things above Reason (1681), Boyle participated in some of the "ongoing theological debates of seventeenth-century England," especially "the question of the proper use of human reason in attempting to unravel the mysteries of Christianity" (11). But while one of Boyle's objectives in "Some considerations" is to show that those who accept
Revelation do not thereby “desert reason,” Boyle did not accept the Deist belief that reason was the criterion by which to judge Revelation, but instead asserted the primacy of Revelation over reason in certain areas. In fact, Boyle endowed his famous eponymous lecture series in part to challenge the rising tide of English Deism, establishing in his will “an Annual Salary for some Divine or Preaching Minister, who shall be enjoyned to perform the Offices following: 1. To preach Eight Sermons in the Year, for proving the Christian Religion against notorious Infidels, viz. Atheists, Deists, Pagans, Jews and Mahometans.”
not only be admitted without Epicurean errors,\textsuperscript{99} but be employed against them” (iv.191-192).

“Some consideration’s” appeal to natural philosophy in the context of considering eschatological resurrection, by all accounts is a supernatural act, may seem somewhat odd, perhaps a harbinger of the changes that the Scientific Revolution would help to bring about, including an attention to this world at the expense of the next, as well as a reliance on reason to the exclusion of revelation. Such an explanation, however, is too hasty—for appeals to nature and the use of contemporary natural philosophy have always played an important role in defending Christian resurrection. As early as the second century, St. Clement was acting as “a pioneer in devising rational arguments of a type later to become classic, to make the idea of a resurrection plausible” that included

\textsuperscript{99} Due to its belief that the human soul is entirely material, and that the universe is the product of chance rather than providence, Epicureanism was traditionally associated with atheism, an association Boyle vehemently denied with regard to his own philosophy: “This concern over the New Philosophy’s possible tendency to atheism is well-known, and underlies much of Boyle’s Christian Virtuoso” (Boyle Reconsidered 102).

\textsuperscript{100} Although Boyle’s corpuscular philosophy had ties to Epicurean atomism, it had ties to other intellectual traditions as well: “The corpuscular philosophy which Boyle developed and applied extensively was neither Cartesian nor Epicurean. Though it partook of some aspects of both, it also embodied ideas drawn from Democritus, Hero, the Aristotelian atomists...Galileo, and, above all, Bacon, of whom Boyle was a passionate admirer” (Boas 92).
analogies to cyclical natural phenomena such as the alteration of day and night, and the
growth and decay of plants of the type examined below (Kelly 463). And as in “Some
considerations,” early patristic writings not only look to the natural world, but also use
contemporary natural philosophy in defending the resurrection:¹⁰¹ for example,
Augustine employed the Greek four-element theory of matter¹⁰² and Athenagoras
employed Galenic digestion theory (the latter is discussed later in this chapter).

¹⁰¹ St. Jerome objects to such appeals: “But as for the arguments drawn from boys, and
infants, and old men, and meats, and excrement, which you employ against the Church,
they are not your own; they flow from a heathen source. For the heathen mock us with
the same. You say you are a Christian; lay aside the weapons of the heathens. It is for
them to learn from you to confess the resurrection of the dead, not for you to learn from
them to deny it” (“Against John of Jerusalem” 32).

¹⁰² Some “reasoners...[, who] bring arguments from the weights of the elements,” argued
that “since the earth is the first of the elements, beginning from the base of the series, the
second the water above the earth, the third the air above the water, the fourth the heaven
above the air, it follows that a body of earth cannot live in the heaven; for each element is
poised by its own weight so as to preserve its own place and rank” (City of God 833).
Augustine himself accepted this Greek doctrine (O’Daly 146), and engages such
“reasoners” on their own grounds: “Our flesh is no doubt derived from the earth.
Philosophical arguments in proof of the assertion that no earthly object can be in heaven
are often urged against faith in the resurrection of the flesh; and yet the philosophers
admit that any body can be changed and transformed into any other... If you ask [the
Part of the reason for this appeal to nature and natural philosophy in defending resurrection is undoubtedly the fact that the primary objection against the Christian doctrine of resurrection has always been based on common sense experience of nature. Indeed, the patristic writers were faced with the same “hackneyed scientific objections, based on the putrefaction of corpses, the fact that they may be consumed by fish or vultures or animals” or even by other men (Kelly 467)\(^{103}\) that Boyle faces in “Some considerations;” to appeal to nature and natural philosophy in defending the resurrection was to counter the most longstanding and commonly-held arguments against it.

Yet, the role of nature and natural philosophy in Christian discussions of the resurrection is not only a defensive one; nature and its processes play such an important role in discussions of Christian resurrection in part because of resurrection’s inextricable link to the Christian understanding of creation; “The Greek doctrine of immortality [of the soul] and the Christian hope in the resurrection [of the entire man] differ so radically objector] whether earth can be changed into water, that will not seem to him incredible because there is no great distance between these two elements...when he has admitted the possibility that earth can be transmuted by these stages into ethereal body, why should it not be possible directly when God so will it, who once made it possible for a human body to walk upon the waters? Why should he not believe that it can happen without these intermediate steps, “in the twinkling of an eye,” as it is written (I Cor. 15:52)?” (“Faith and the Creed” ix.24).

\(^{103}\) Chapter seventeen, “The Christian Hope,” in Kelly’s *Early Christian Doctrines* provides a good overview of early Christian discussions of resurrection.
because Greek thought has such an entirely different interpretation of creation” (Cullmann 166). As we saw in the previous chapter, the Christian concept of creation *ex nihilo*, according to which God is the creator of all things, is contrary to dualistic Greek cosmologies such as Plato’s, which presents the universe as created by a demiurge from pre-existing matter. The Judaic-Christian God had made all, and all he made was good (as reported in “Genesis” and necessitated by his being both omnipotent and benevolent.

These two very different views of creation entail two very different concepts of man. Viewing the material world as debased, Greek dualism identifies the person with the immaterial and immortal soul. Accordingly, the material and mortal body is foreign to personal identity and happily left behind at death. As Augustine observes with regard to the resistance to the body’s resurrection he encountered: “The foremost of the [Greek] philosophers agree with us about the spiritual felicity enjoyed by the blessed in the life to come; it is only the resurrection of the flesh they call in question, and with all their might deny” (*City of God* 855). In contrast to the Greek identification of the human with the immortal soul, Christianity leans toward the Hebrew conception of man as a “psychosomatic unity.”\(^{104}\) Such an integrated concept of human nature is encouraged by the Christian view of creation *ex nihilo*: “If matter is not a principle of evil then there is

\(^{104}\) Another Hebrew aspect of Christian doctrine of eschatological resurrection is the notion that humanity (indeed, the entire creation) shares a common fate, accepting “the Old Testament conviction, often repeated, about the ‘Day of the Lord’ … the end of the world, involving universal judgment and the advent of ‘new heavens and a new earth’” (*Grand Design* 5).
nothing in the body which is opposed to divine goodness... It belongs inseparably to human nature. The final integrity of man requires that he shall have a body” (Versfeld 114). So while “in Platonist ears, Christian talk of a redemption of the body must inevitably have sounded like talk of a round square” (Norris 91), Christianity’s view of creation, and the body’s accordingly “high metaphysical status,” 105 all but necessitates such a redemption.106

105 Augustine “understood that the Christian doctrines of creation, the Incarnation of Christ, and the doctrine of the resurrection of the body all imply that the body has a high metaphysical status and is an integral and permanent part of human being” (Miles 60). As exampled here by Augustine and explored in Versfeld’s work, the patristic writers emphasized the mutual relations among creation *ex nihilo*, Christ’s incarnation, and the human body’s resurrection. For example, Tertullian argues that Christians who, having “absorbed the pagan disdain for the physical body” (Davis 31), hold a heretical view of creation also hold a heretical view of Christ’s incarnation and, accordingly, of resurrection. Thus, if they are “refuted touching God as the Creator, and Christ as the Redeemer of the flesh, they will at once be defeated also on the resurrection of the flesh” (ii.546).

106 Certainly, there are other bases on which to argue for resurrection, including the notion of justice and “the reasonableness of a system of rewards and penalties” (Kelly 466-467). This was the approach adopted by “Justin Martyr [who] in his first Apology sounds a note which would characterize later defenses of the resurrection: the resurrection is vital to God’s judgment of men for their deeds in this life. Justin states that
Of course, as we saw so vividly in chapter one’s consideration of Donne, the goodness of God’s creation has been compromised through sin. But we also saw that resurrection was instituted precisely in order to redeem sin and its effects; Christian resurrection is accordingly not “a freeing [of the soul] from the body and the world, [but] a freeing of the body and the world from sin and death” (Greshake 176). As Augustine observes with regard to man’s body specifically, “there shall then [in the resurrection] be no corruption, which is the only evil thing about the body” (City of God 856; my emphasis). And indeed, not only the human body, but all of creation will be restored to its original goodness and so, in this sense, it is the “miracle of creation which the Resurrection completes” (Versfeld 131).

In sum, Boyle’s appeal in “Some considerations” to the natural world and contemporary natural philosophy is in keeping with traditional Christian discussions of resurrection. Furthermore, Boyle’s concern with the identity of the pre- and post-resurrection bodies, which is central to “Some considerations,” is also in keeping with the traditional understanding of Christian resurrection as redemption—as a restoration of God’s original creation rather than the institution of a new one. But as we see next, the Christians believe with Plato that the wicked will be punished, but that in their very bodies, united with their souls, they will be tormented eternally” (Craig 3).

107 “The affirmation of the physical identity of the resurrection body and of the body of flesh had been made by Pseudo-Justin before Tertullian’s time, and was to be repeated by Methodius of Olympus and Gregory of Nyssa in answer to Origen” (Daniérou 396). In contrast, the Gnostics “believed that eschatological resurrection would take place in
particular brand of natural philosophy Boyle uses in “Some considerations”—namely, his mechanical-corporeal philosophy—is fundamentally different from, and fundamentally inferior to (with regard to the goal of defending resurrection), the realist natural philosophies used by earlier Christian writers.

In this dissertation’s introduction, we saw how a being-based cosmology gives rise to a realist ontology. In the Christian tradition, this realist ontology is based on the notion that God’s rational being is the ground of all existence, and that it is this rational being that is expressed in the various forms that constitute creation: “The metaphysics of traditional scholasticism is ontologically realist in positing the extramental existence of universals such as species and genera as forms of divine reason” (Gillespie 12). Relying on the premise that the rational system of being expressed in creation is hierarchical (“based on different participation in [God’s] esse” [Lytikens 113]), and that this “hierarchy of being” must be continuous, a “plenum forum,” Tertullian concludes that man must retain his unique ontological position in the resurrection: “Christ at His coming did not proclaim that the human nature should, when it is immortal, be remoulded or transformed into another nature, but into what it was before the fall. For each one among bodies of a different nature.” (Daniélou 396). It should be noted that what constituted continuity between the pre- and post-resurrection body was debated throughout the Christian tradition, a debate Bynum has recently explored in The Resurrection of the Body in Western Christianity, 200-1366. Boyle himself recognizes that many accept a looser definition of this continuity than he argues for in “Some considerations.”
created things must remain in its own proper place, that none maybe wanting to any, but all may be full” (366).\textsuperscript{108}

Since these universal forms are all objects of God’s mind, they constitute one rational system, the relationships among which are knowable through deduction. As Gillespie remarks: “If the basic premise of realism, the extramental existence of universals, is accepted and if these universals are identified with God’s thoughts...then logic becomes a universal science that explicates the necessary and essential relations of all created things” (18). Furthermore, the realist form is both the formal and final cause, in other words, it provides a creature with both its essence and its telos, which is the material realization of that essence. Early Christian writers were thus able to use other forms of creatures and the processes they underwent as evidence for man’s resurrection. St. Cyril of Jerusalem, for example, fuses Paul’s famous seed analogy with his own hierarchical, ontological view of creation in order to argue for man’s resurrection: “You sow wheat, let us say, or some other kind of grain; the seed, falling into the ground, dies and rots, becoming useless for food. But then it rises a green herb; and that tiny seed is reborn in beauty. But wheat was made for us, for it was for our use that what and all seeds were created, not for their own sake. \textit{If creatures made for our service come to life}

\textsuperscript{108} See Lovejoy 52 ff. for further discussion of the idea of “plenum forum” and its history.
again, shall we, for whom they were created, rise no more after death?” (xviii.123; my emphasis). ¹⁰⁹

In a number of instances, God is presented as having created a certain type of creature with view to expressing his intention to resurrect man. The phoenix, unique and therefore perhaps less explicable in purely natural terms, was particularly favored in such arguments. St. Cyril, for example, argues: “The Greeks...demand an unequivocal precedent of an animal that after total decay has risen again. God knew men’s unbelief, and for this reason provided a bird called the phoenix. The phoenix, as Clement writes and many others record, alone among birds, comes into Egypt every five hundred years, and demonstrates the resurrection” (xviii.8; my emphasis). As Cyril goes on to note, the phoenix’s resurrection “demonstrates” man’s resurrection by virtue of each creature’s relative position in the order of being: “The phoenix is a wonderful bird, but irrational, and it never sang psalms to God. It flies through the air but does not know who is the Only-begotten Son of God. If resurrection from the dead has been granted to this irrational creature that knows not its Maker, will not a resurrection be granted to us, who praise God and keep His commandments?” (xviii.124). If the irrational phoenix is

¹⁰⁹ Tertullian uses the same type of argument, ending his observations of numerous cyclical phenomena in both sky and land with the rhetorical question: “And surely, as all things rise again for man, for whose use they have been provided—but not for man except for his flesh also—how happens it that (the flesh) itself can perish utterly, because of which and for the service of which nothing comes to nought?” (12; 554).
honored with resurrection, man, who is a higher being (evidenced by his being rational), must also be honored in this way—any other conclusion would be illogical.

In sum, the realist view of nature shared by these early Christian writers allowed them to find evidence in the natural world for man’s resurrection to a next world. Tertullian celebrates nature’s ability to provide such testimony, exclaiming: “Incredible, no doubt, it might be, if it had not been revealed in the word of God; except that, even if it had not been thus first announced by God, it might have been fairly enough assumed, that the revelation of it had been withheld, simply because so many strong presumptions in its favour had already been furnished...In His works did God write it, before He wrote it in the Scriptures. He proclaimed it in His mighty deeds earlier than in His inspired words. He first sent Nature to you as a teacher, meaning to send Prophecy also as a supplemental instructor” (553).

Boyle’s voluntarist theology, as we saw above, would not allow God’s will to be constrained by a real system of created essences. Without the realist forms and their entailed ends, nature no longer provided evidence for resurrection. Accordingly, whereas Tertullian sees man’s resurrection as written in nature (even more fundamentally than it is written in Scripture), Boyle finds nothing in nature that would lead him to the idea of

110 Boyle rejects both “the substantial forms of the Schoolmen and the hylarchic [or plastic] principle of [Browne and] the Cambridge Platonists” (Wojcik 166). A number of critics have noted that Browne’s ideas have much in common with the Cambridge Platonists (see, for example, Dunn 88-89 and 131-132), including a common belief in *prisca theologia* and a “plastic nature.”
resurrection: “First I take it for granted, that [one] does not mean, whether the resurrection is a thing knowable, or directly provable by the mere light of nature. For if God had not, in the Scripture, positively revealed his purpose of raising the dead, I confess, I should not have thought of any such thing” (192; my emphasis).  

The realist natural philosophies connect this world to the next not only epistemologically, as discussed above, but also ontologically or really—and it does this through the notion of “final causality,” in that term’s traditional sense as “a teleology inherent in all natural processes” (Osler 162). For given a realist ontology, all motion (local or developmental) is qualitatively determined by form: “all natural motion ha[s] a

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111 While Boyle categorizes resurrection as a thing above reason, he does not consider it contradictory to reason (of course, this is implied by the very existence of “Some considerations,” which is an attempt to reconcile resurrection with natural philosophy): “By such things then in theology, as may be said to be above reason, that is, reason unassisted by supernatural revelation, would never have discovered to us; whether those things be to our finite capacities clearly comprehensible or not...there are divers truths in the Christian religion, that reason, left to itself, would never have been able to find out, nor perhaps to have so much as dreamed of, such as are most of those, that depend upon the free will and ordination of god; as, that the world was made in six days, that Christ should be born of a virgin, and that in his person there should be united two such infinitely distant natures as the divine and human; and that the bodies of good men shall be raised from death, and so advantageously changed, that the glorified persons shall be like (or equal) to the angels” (v.542-543).
developmental character. Bodies naturally mov[e] so as to fulfill their natures, to transform the potential into the actual, to move toward where it was natural for them to be…. Just as the acorn’s development into the oak was the transformation of what was potential into what was actual, so the fall of an elevated stone was the actualization of its potential, the realization of its ‘nature’” (Shapin 29). Indeed, in the realist view all the changes a creature goes through are directed towards an end determined by the specific form of that creature. In sum, a substantial form, by determining a creature’s nature, also determines that creature’s telos or final cause, which is to fully realize or “actualize” that (otherwise potential) nature. In other words, in this view the end of a thing is inherent in its creation, for it is created as a certain thing, i.e., as having a certain nature, and thus also as having a certain end. Athenagoras,\(^{112}\) for example, argues that man’s end was determined at his creation as man—i.e., as a composite creature consisting of both body and rational soul: “The Creator of our universe made man that he might participate in

\(^{112}\) There is dispute over whether the second-century Athenagoras is in fact the author of De Resurrectione. Grant claims that he is not, basing his claim in part on the fact that the arguments provided in De Resurrectione are not the type promised in Legatio: “the promise in the Legatio of further discussion of resurrection involves the use of Platonic and Pythagorean parallels (Leg. 36,3). Nothing of the sort is found in the treatise [De Resurrectione], which uses some Platonic language but relies solidly on Aristotelian arguments” (123). But whether De Resurrectione is a product of the second-century Athenagoras or “a third or early fourth century” Pseudo-Athenagoras does not impact our discussion here.
rational life and, after contemplating God’s majesty and universal wisdom, perdure and make them the object of his eternal contemplation, in accordance with the divine will and the nature allotted to him. *The reason then for man’s creation guarantees his eternal survival, and his survival guarantees his [body’s] resurrection, without which he could not survive as man*” (121; my emphasis).

Since “there can be no movement where there is no potentiality to something else, for movement is the act of that which is in potentiality” (*Summa Contra* iii.xx), there is a very real sense in which each human life is already involved in a process of growth or “perfection” that will culminate in his or her resurrection. St. Thomas Aquinas, for example, makes reference to man’s nature—the form that is man’s species—^113_to argue that all human bodies, not just a chosen few, will be resurrected: “Those things, the reason of which comes from the nature of a species, must needs be found likewise in all the members of that same species. Now such is the resurrection; because…the soul cannot have the final perfection of the human species, so long as it is separated from the body” (Question 75, art. 2).^114_

It was not only the fact of the body’s resurrection, but also the resurrected body’s qualities, that followed from this idea of resurrection as the culmination of life as a process of realizing potential form. For example, both St. Augustine and St. Aquinas

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^113_*As Lyttkens observes with regard to Aquinas’ philosophy, “form determines the species of a thing”* (166).

^114_*“Human nature involves the body as well as the soul and spirit, hence resurrection (of the body) is necessary for complete human realization”* (Craig 34-35; my emphasis).
agree "that the resurrected body may contain no defect, and that a body remains imperfect until it attains adult stature; [thus] its resurrected size, for those who died as infants, is that which it would have attained after its growth was complete—which varies from person to person" (Martí 315). Here, one who died as an infant will be resurrected with the "adult stature" it would have attained had its process of growth, i.e., its process of "perfection"—a process determined by its individual form (and thus "varying from person to person")—not been cut short by early death.\textsuperscript{115}

\textsuperscript{115} As seen below, although each man shared a species form, each such form was individualized.

\textsuperscript{116} For Boyle, on the other hand, the qualities of the resurrected body, such as their "adult stature," are not the full realization of an individual’s essential nature, but instead, "mechanical affections" of matter that can be produced in any "assigned portion of matter:" "The qualifications the Christian religion ascribes to the glorified bodies of the raised saints... agility, indifference to gravity and levity, incorruption, transparency and opacity, figure, colour, &c., being but mechanical affections of matter, it cannot be incredible, that the most free and powerful author of those laws of nature, according to which, all the phenomena of qualities are regulated, may (as he thinks fit) introduce, establish, or change them in any assigned portion of matter, and consequently in that, whereof a human body consists" (201). Indeed, Boyle himself has been able to produce such changes in "mechanical affections," though in metal rather than human bodies: "we shall not much scruple at the admission of such an effect from such an agent, if we consider, how much the bare, slight, mechanical alteration of the texture of a body, may
Realist natural philosophies, in sum, connected this world to a next not only logically, through deduction from essences and their entailed ends, but also really, through the operation of “final causality.” Boyle’s voluntarist theology and entailed nominalist ontology require that he reject both realist forms and final causality;\textsuperscript{117} in Boyle’s view “the world to its very core is contingent and governed only by the necessity that God momentarily imparts to it. There thus are no universals, no species or genera. There are likewise no intrinsic ends for individuals that arise out of and correspond to the essence of their species” (Gillespie 17). According to Boyle, the changes that take place in the natural world are not the result of any formal or spiritual principle(s) operating in change its sensible qualities for the better. For, without any visible additament, I have several times changed dark and opacious lead into finely coloured transparent and specifically lighter glass” (202).

\textsuperscript{117} In fact, this view of natural processes “as each body’s attempt to fulfill its own nature” (Wojcik 124)—i.e., to realize its own form—is the main target of Boyle’s \textit{Enquiry into the Vulgar Conception of Nature}. As we saw in this dissertation’s introduction, Boyle’s rejection of realism and embracing of nominalism was grounded in his voluntarist theology: “Consistent in his voluntarism Boyle was a nominalist, and his nominalism directly informed both his philosophy of nature and his scientific method. Boyle’s major treatise, A \textit{Free Inquiry into the Vulgarly Received Notion of Nature} (1685/6), articulated and defended his corpuscularianism in the context of his voluntarist understanding of God’s relationship to the creation” (Osler 186).
matter: "reason plunged into matter, and, as it were, fuddled in it and confounded with it" (Dunn 98) in such a way that it could cause changes in that matter. Indeed, Boyle specifically targets such a Scholastic notion of form, arguing: "The schools have of late much amused the world with a way they have got of referring all natural effects to certain entities, that they call real qualities [determined by a substantial form], and accordingly attribute to them a nature distinct from the modification of the matter they belong to, and in some cases separable from all matter whatsoever" (vi.12).

Since in Boyle's mechanical philosophy "matter and its modifications make up all that there is" (Klaaren 161), Boyle describes all change as "the effect and results of local motion, and two or three other mechanical affections [identified elsewhere as size,

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118 The rejection of any non-physical aspect in material creation results in the type of ontological dualism that is arguably one of the Scientific Revolution's bitterest legacies: "The seventeenth century bequeathed unsolved to the eighteenth the problem of discovering some intrinsic connexion between matter and mind: some connexion which would preserve the special character of each, and yet make them genuinely and intelligibly parts of the same world" (Collingwood 113).

119 As Klaaren has also remarked, this constituted a substantial rise in the estimation of matter. As we saw in chapter one, matter has a very precarious moral and ontological status in traditional, being-based Christian cosmogonies Whereas matter had been previously viewed as merely "the substratum for change, where change was understood in terms of the actualizing of potential [real] forms" (Osler 172), matter, in motion, was the only real component of the material world.
figure and texture, i.e., the primary qualities\textsuperscript{120} of the small part of the universal matter, acting on one another according to settled laws” (vi. 679). While Boyle held that God “did, at the beginning of things, frame things corporeal into such a system, and settled among them such laws of motion, as he judged suitable to the ends he proposed to himself in making the world,” these “settled laws” of motion do not inhere in the material itself; “the world does not run on immanent principles of any kind” (Osler 181).\textsuperscript{121}

Man’s resurrection is no longer the logical and real end of a natural process established in man’s nature and operating throughout his life. Having “rejected the Aristotelian metaphysics of matter and form and replaced it with a mechanical

\textsuperscript{120}Galileo first made the distinction between primary and secondary qualities: “In considering any substance Galileo maintained that he was unable to conceive of it without attaching to it the qualities of size, shape, weight and position. On the other hand, he did not feel that all bodies necessarily must possess colour or taste or smell. Indeed, the perception of such qualities, Galileo maintained, was dependent upon the existence of the observer. Galileo therefore was led to make the famous distinction between primary qualities (i.e. those possessed by and necessary to the object) and secondary qualities (i.e. those dependent upon the observer)” (Fowler 147).

\textsuperscript{121}Furthermore, although God’s “general concourse maintain[s] the order of nature,” in keeping with Boyle’s voluntarist theology, God is in no way bound by this order: “God created the world absolutely freely, and it continues to exist contingent on his will. Consequently, the created world contains no element of necessity. He can create regularities—laws of nature—and he can alter them at will” (Osler 180).
reinterpretation of natural processes, Boyle considered finality to be imposed
supernaturally by a providential god. The purpose evident in natural processes is divine
purpose, imposed from without” (Osler 162). Such “purpose” is contingent to the creature
itself, being the immediate effect of God’s will. Accordingly, Boyle must rely fully on
that will for any hope of resurrection; as Boyle states in “Some considerations,” he can
only base his belief that the resurrection will in fact take place on the basis of “God’s
omnipotence and promise.”

While Boyle recognizes in “Some considerations” that he cannot provide any
evidence from nature that resurrection will take place,\(^{122}\) he does believe that he can show
resurrection compatible with physical processes and, in doing so, refute “those
difficulties, which are said to demonstrate the impossibility of the resurrection; the
substance of which may be comprised in this objection. When a man is once really dead,
divers of the parts of the body will, according to the course of nature, resolve themselves
into multitudes of steams, that wander to and fro in the air; and the remaining parts, that
are either liquid or soft, undergo so great a corruption and change, that it is not possible
so many scattered parts should be again brought together, and re-united after the same
manner wherein they existed in a human body, whilst it was yet alive” (iv.195). As we

\(^{122}\) While it is true that “the eschatological resurrection cannot be \textit{empirically} proved
because there is no empirical data for this future event” (Craig 62), we saw above that,
previous to empiricism’s rise, in which cause and effect is a matter of correlating
empirical states of “before” and “after,” the realist ontology had forwarded a view of
cause and effect as a matter of logical (and ontological) entailment.
saw earlier in this chapter, this objection was the longest standing one to the doctrine of Christian resurrection. Boyle goes on to note the two traditional bars to such reintegration—consumption by animals and, worse yet, by other humans: “And much more impossible it is to effect this re-union, if the body have been, as it often happens, devoured by wild beasts or fishes; since in this case, though the scattered particles of the cadaver might be recovered as particles of matter, yet having already passed into the substance of other animals, they are quite transmuted, as being informed by the new form of the beast or fish that devoured them, and of which they now make a substantial part. And yet far more impossible will this redintegration be, if we put the case, that the dead body be devoured by Cannibals; for then the same flesh belonging successively to two differing persons, it is impossible that both should have it restored to them at once, or that any footsteps should remain of the relation it had to the first possessor” (iv.196).

In his above setting out of the objection he wishes to refute, Boyle implies that this objection is based on a realist notion of “form” and such a form’s substantiative relation to matter; although “scattered particles of the [human] cadaver might be recovered as particles of matter, yet having already passed into the substance of other animals, they are quite transmuted, as being informed by the new form of the beast or fish that devoured them, and of which they now make a substantial part.” Since in the realist ontology “form ma[kes] each body the kind of object it is” (Wojcik 124), matter merely providing form with its ground for progressive actualization,123 once the matter is

123 As Collingwood explains: “A chick is trying to become a hen, but it is not yet a hen: there is in it a nisus towards the form of a hen, but there is also in it something in virtue
incorporated into a new body and thus "transformed" by that body's nature or "substantial form," it would seem to lose all connection to its previous, human form.

It was precisely against this idea that the changes of a body are attributable to its transformation—i.e., the replacement of one substantial form with another—that Boyle uses his "circulation" experiments in "The Origin of Forms and Qualities," the same type of "circulation" experiments Boyle presents in "Some considerations."\(^{124}\) In such experiments, Boyle puts a material (usually a metal) through various operations (heating, reducing, combining with other materials, etc.), finally returning the material to its original state. Boyle argues that such a "circulation" process shows that the changes matter undergoes are the effect not of a natural, transcendent "form" (which could not be produced artificially) but rather, of local changes in the matter's motion and primary qualities: "we shall not wonder that a portion of matter that is indeed endowed but with a very few mechanical affections, as such a determinate texture and motion [e.g., primary qualities], but is placed among a multitude of other bodies that differ in those attributes from it and one another, should be capable of having a great number and variety of relations to those other bodies, and consequently should be thought to have many distinct

\(^{124}\) The new philosophy's ideal of operational knowledge is typified in such "circulation" experiments, in which change is not linear in order to realize an end inherent to the material, but rather circular in order to realize man's end of gaining knowledge.
inherent qualities by such as look upon those several relations or respects is may have to bodies without it, as real and distinct entities implanted in the body itself” (vi.20).\textsuperscript{125}

One of the primary problems Boyle faces in “Some considerations” is the question of what constitutes a body’s identity (for as we saw above, the Christian doctrine of resurrection is one of redemption, not a new creation): “I shall desire your leave to lay down in this place, a couple of considerations; of which I shall begin with this, that it is no such easy way, as at first it seems, to determine, what is absolutely necessary and but sufficient to make a portion of matter, considered at differing times or places, to be fit to be reputed the same body” (iv.193). In the realist philosophies, the identity of a man’s body was constituted by its matter’s information with that man’s

\textsuperscript{125} The human body—specifically, the senses—were counted among these “relations” that attributed to bodies qualities that were not in fact there (independent of the relation, i.e., the sense impression): “And whereas one body doth often seem to produce in another divers such qualities as we call sensible, which qualities therefore seem not to need any reference to our senses; I consider, that when one inanimate body works upon another, there is nothing really produced by the agent in the patient, save some local motion of its parts or some change of texture consequent upon that motion; and so, if the patient come to have any sensible quality that it had not before, it acquires it upon the same account upon which other bodies have it, and it is but a consequent to this mechanical change of texture, that, by means of its effects upon our organs of sense, we are induced to attribute this or that sensible quality to it” (“Origin of Forms” 25).
unique form or “soul.” As mentioned above, in such philosophies “form ma[kes] each body the kind of object it is” (Wojcik 124). And while the forms of other animals are common to all members of the species, a human form, while including that of the species, was considered unique, and thus individualized the body it informed; as the patristic writer Gregory of Nyssa remarks: although humans are “molded from a common material, each being has its own individual form which differs greatly from the others in the same genus” (231).

This individual form transformed the matter in precisely the sense Boyle argues against in “The Origin of Forms and Qualities,” as noted above. Athenagoras, for example, argues against the same objection to resurrection Boyle argues against by

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126 Whereas man’s soul had previously consisted of a number of levels, spanning from the vegetative to the rational—as we saw in our consideration of Browne—Boyle only recognized this highest, transcendent “rational soul.”

127 Although the form is common to all members of a species (except with regard to man), the actualization of the form in the material world constitutes that individual’s life, which is unique and includes what are referred to as “accidental forms.”

128 Boyle’s near contemporary, Kenelm Digby, refers to man’s substantial form as “particularizing the body” (Christian Mortalism 50).

129 Gregory views this transformative relationship between soul and matter as continuing beyond death: “When the dissolution occurs, the soul, which is the owner of the vase [the body], recognizes its own in what remains, and is not separated from it in the mass of the fragments even if the material of the elements is mixed with the unused matter” (231).
asserting that each man’s unique form “informs” the matter in which it is realized in such a way that it regulates the body’s process of digestion. Athenagoras argues that God has “adapted to the nature and species of each animal a suitable and appropriate food…he permits the individual species of created beings the active and passive functions which are natural” (99). It is the realist form, united with and indeed transformative of the body’s matter and its processes, that does not allow “unnatural” digestion: “the same natural food undergoes a transformation corresponding to each species of animal and the body that is being nourished” (101). Accordingly, “there are…different kinds of natural food corresponding to the various kinds of naturally distinct animals; and even of such food neither all, nor any random part, that is set before the animal admits of fusion with the body which is being nourished, except that which has been purified at every stage of digestion and entirely transformed, with a view to its union with a body of a particular kind; consequently it is clear that nothing contrary to nature can ever be united with anything for which it is not a fitting and proper food” (103). Athenagoras concludes that man’s form individualizes the matter of his body in such a way that it is unsuitable nutrition for all other creatures, including other men.130

130 While admitting that some things ‘contrary to nature’ can attach to the body temporarily, e.g., a cannibal can grow fat from eating other humans, Athenagoras viewed this as only a transitory phenomenon that does not factor into that creature’s identity, which is instead determined by the creature’s nature, or form: “only that flesh stays with our members, remaining naturally united with them by bonds of intimacy and familiarity,
As mentioned above, Boyle rejects this notion of form operating in matter, as Athenagoras presents man’s form as regulating his body’s digestive processes. In fact, for Boyle the human body, rather than being informed by a human soul and thereby enjoying the “high metaphysical position” it enjoyed in the patristic writings, is merely one machine among others: “a very compounded engine that, besides these consistent parts, does consist of the blood, chyle, gall and other liquors; also of more subtle fluids, as spirits and air; all which liquors and fluids are almost incessantly and variously moving, and thereby put diverse of the solid part, as the heart and lungs, the diaphragm, the hands, feet, etc., into frequent and differing motions” (Enquiry 128). Certainly, Boyle is quick to point out that “though the body of a man be indeed an engine, yet there is united to it an intelligent being (the rational soul or mind)” (Enquiry 134). However, Boyle never elaborates on the nature of this “union,” regarding it as a unique “riddle” of creation: “The conditions of the union of the soul and body…were settled at first by which has been selected by nature and joined to those parts along with which it contributes to life according to nature and sustains life’s labours” (107).

131 In Enquiry Boyle explicitly rejects the notion that something immaterial, such as form, cannot affect something material (78).

132 Interestingly, in arguing against such a real, operating form, Boyle also uses an example drawn from digestion; whereas Athenagoras presents each man’s form as a benevolent keeper of his health by disallowing digestion of “unnatural” foods, Boyle presents precisely such ingestion of “unnatural foods”—i.e., pica—as a counter-example, in which ‘nature’ seems intent on doing what is bad for the individual (Enquiry 136).
God’s arbitrary institution, and having nothing in nature parallel to them, the manner and terms of that strange union is a riddle to philosophers” (v.150).\textsuperscript{133} Certainly, whatever relation exists between the body and soul for Boyle,\textsuperscript{134} it is not the close relationship the

\textsuperscript{133} Given the mechanical philosophy’s “removing all [inherent] activity from matter and carefully separating matter from spirit” (Osler 179) such a union was “strange” indeed.

\textsuperscript{134} Boyle does consider the possibility of a “plastic power” during what he terms “preliminary considerations.” Needless to say, the supposition of such an active principle immanent to matter is incompatible with Boyle’s mechanical philosophy. Although it is true that Boyle held “a stratified view of matter in which the simplest particles operated along completely mechanical lines (though not without god’s ‘preserving concourse’), and the higher levels of living beings were definitely supranechanical (requiring special providence),” only those that “operated along completely mechanical lines” were subject to the mechanical philosophy. \textit{Not surprisingly, as the reach of this philosophy grew, the realm of “special providence” shrank.} This can be seen in Boyle’s own work, in which: “Intermediate levels, like those of crystals and metals, were subject to question. In his earlier writings, Boyle viewed the growth of crystals and gems as exhibiting seminal principles...just as the growth of living creatures did. But later (in 1672), he treated the structure of gems as reducible to the underlying geometry of the arrangement of atoms. In effect...Boyle was appealing to gaps in the mechanical account as hard evidence for the design and immediate providence of God. But if crystals could be explained in terms of atomic structures, why couldn’t living creatures?” (Kaiser 233). And indeed, in
two shared previously; in place of a body whose form transforms it, even regulating its processes to the benefit of the creature, Boyle presents us with those “hydraulico-pneumatical engines we call human bodies...[in which] things are generall performed according to mechanical laws and courses, whether the effects and events of these prove to be conducive to the welfare of the engine itself” (Enquiry 134; my emphasis).

Unable to secure the body’s identity by appeal to a form that transcends (indeed, determines) material changes, Boyle claims to secure the body’s identity by appeal to a continuity of its matter, concluding that “a comparatively small quantity of the matter of a body, being encreased either by assimilation or other convenient apposition of aptly disposed matter, may bear the name of the former body” (iv.194). Boyle argues for such continuity through the “circulation” experiments mentioned above, by which “a natural body being dissipated and as it were taken in pieces like a watch, may have its parts so associated as to constitute new bodies of natures very differing from its own and from each other, and yet these dissipated and scattered parts, by being re-collected and put together again like the pieces of a watch in the like order as before, may recompose...such [a] body as that they made up before they were taken asunder” (“Origin of Forms” 49).

In such experiments, especially as presented in “Some considerations,” Boyle appeals to semi-permanent corpuscles that “retain their own nature” throughout the various processes: “A body may either consist of, or abound with such corpuscles, as may

another work Boyle moves up the chain of being from stones or “gems” to argue against the notion of a vegetable soul (“Origin of Forms” 44).
be variously associated with those of other bodies, and exceedingly disguised with those mixtures, and yet retain their own nature” (iv.196). Such semi-permanent corpuscular “natures” are what Boyle considers to be “elements.” Yet, as Holmyard observes, for Boyle “element” is an epistemological rather than ontological category: “If a substance is undecomposable it is to be considered an element, and it will retain that title for just so long as it withstands the efforts of chemists to decompose it.…Boyle’s definition of an element was purely empirical” (140).

Indeed, Boyle’s “elements” can have no ontological standing because, as noted above, Boyle’s mechanical philosophy recognizes the material world as consisting of only matter and motion, and Boyle considers matter to be fundamentally homogeneous, a “universal matter” whose even “primary” qualities are ultimately determined by motion: “Since bodies, having but one common matter, can be differenc’d but by Accidents, which seem all of them to be the Effects and Consequents of Local Motion, I see not, why it should be absurd to think, that…almost anything may at length be made Anything” (Boyle Reconsidered 92). Certainly, some “elements” can be more permanent, i.e., harder to dissolve, than others—but they have no ontological standing;¹³⁶

¹³⁵ As Steven Shapin has observed, for Boyle “Matter and motion were like the letters of the alphabet, simple and finite in themselves but capable in combination of producing almost endless diversity…everything in the natural world was to be explained with reference to the irreducible properties of matter and its states of motion” (46).

¹³⁶ Interesting in this regard is Boyle’s appeal in “Some considerations” to the semi-permanency of bones as providing the body with material continuity. We may agree with
in the final analysis, they too are the transitory effects of motion applied to homogenous matter by an external source.\textsuperscript{137} “Let a portion of matter be never so fine, and never so well contrived, it will not be any more than an engine devoid of intellect and will, truly so called, and whose excellency, as well as its distinction from other bodies, even the grossest and imperfectest, can consist but in mechanical affections, such as the size, shape, motion and connexion of its parts; which can neither excite themselves into motion, nor regulate and stop the motion they once are in” (v.141).

Brown, however, in pointing out that, with regards to eternity, “To subsist in bones, and be but Pyramidally extant, is a fallacy in duration” (308).

\textsuperscript{137} That Boyle’s implication that semi-permanent corpuscles can retain a thing’s identity through various processes is invalid is shown in his statement that “Body and body being but a parcel, and a parcel of universal matter mechanically different; either parcel may successively put on forms in a way of circulation, if I may so speak, till it return to the form, whence the reckoning was begun, having only its mechanical affections altered” (iv.198). Since it is precisely on these “mechanical affections” that Boyle bases the body’s identity (“Since the true notion of body consists either alone in its extension, or in that, and impenetrability together, it will follow, that the differences, which make the varieties of bodies we see, must not proceed from the nature of matter, of which, as such, we have but one uniform conception, but from certain attributes; such as motion, size, position &c. that we are wont to call mechanical affections”) it is hard to understand how identity can be retained if the mechanical affections that constitute that identity are altered.
Despite Boyle’s implications to the contrary, the only thing that ensures the material’s identity in Boyle’s experiments is the fact that it is material used in his experiment.\textsuperscript{138} Boyle seems to recognize this partially, hypothesizing an “intelligent and otherwise duly qualified agent to watch this matter in its whole progress” who can “lay hold of this portion of matter cloathed in its ultimate (last) form, and extricating it from any other parcels of matter, wherewith it may be mingled, make it exchange its last mechanical affections for those, which it had, when the agent first began to watch it” (iv.197).

There is nothing unique in “human corpuscles” that lead to their resurrection. Any parcel of matter can be returned to its original material affections—“Body and body being but a parcel, and a parcel of universal matter mechanically different; either parcel may successively put on forms in a way of circulation, if I may so speak, till it return to the form, whence the reckoning was begun, having only its mechanical affections

\textsuperscript{138} This is the way identity is understood in modern chemistry: “we can take a measured quantity of metal, put it through any process of transformation into compounds and alloys, and then recover it unchanged in quantity and character (within the limits of experimental error). We can, if we take sufficient trouble, follow ‘it’ as an ‘historic route of occasions’ (to use Whitehead’s convenient terminology). In any one set of operations there is a specific, continuous, indeed unique, occupation of certain spatio-temporal volumes...It all happens within certain regions of space at certain times. It all happens within certain regions of space at certain times, nowhere else, and within those same regions only certain other compatible events are happening” (Ritchie 104).
altered” (iv.198)—and whether or not a body will be returned to its original affections depends on the subject’s decision if it “is to be reproduced” or not. “In such case, I say, this portion of matter, how many changes and disguises soever it may have undergone in the meantime, will return to be what it was; and if it were before part of another body to be re-produced, it will become capable of having the same relation to it, that formerly it had” (iv.197).139

Boyle ends “Some considerations” pretty much where he began—namely, relying fully on God’s will with regard to the resurrection; asking: “why should it be impossible, that a most intelligent agent, whose omnipotence extends to all that is not truly contradictory to the nature of things, or to his own, should be able so to order and watch the particles of a human body…and thereby restore or reproduce a body; which, being united with the former soul, may, in a sense consonant to the expressions of scripture, recompose the same man, whose soul and body were formerly disjoined by death.”

139 Of course, the “disguises” Boyle speaks of here are only relative to what state the material was in at the beginning of the process, from which the subject’s/experimenter’s “reckoning” began.
Chapter Four

*The Rise of Mechanistic Medicine during London's Great Plague of 1665*

The plague that ravaged London in 1665 was the last great pestilence England experienced. At the time, plague was declining throughout Europe, with only a few isolated (though devastating) outbreaks continuing into the nineteenth century. During these years of the last great plagues—years that followed, and remembered, centuries devastated by plagues—mechanistic medicine, with its conceptualization of the human body as a machine and its experimental and diagnostic techniques, was developing. The attractiveness of a mechanical conceptualization of the body in the wake of centuries of plague is understandable; if the body were a machine, medicine might be able to fix the body as necessary to maintain life.\(^\text{140}\) Not only might disease be overcome, but death itself unnecessary, perhaps even avoidable. For whereas in the Judeo-Christian tradition death is a necessary part of human life, the inescapable punishment for all offspring of Adam and Eve, in mechanistic medicine death makes little sense. Since the whole teleology of machinery is to function, for the mechanistic body death is “an offensively meaningless event” (Sontag 8); death is merely a break down in machinery, and machinery need not break down, if properly maintained. Rather than the result of a moral

\(^{140}\) “The idea of the divine acting on the human body was being gradually pushed outward towards both ends of the life cycle, life and death, leaving life itself a purely natural phenomenon proceeding under regular laws which the physician could predict and take advantage of” (Kocher).
failure inseparable from being human, death becomes a technical failure that ought to be combated through technology.

By redefining the human body as a machine, mechanistic medicine established the doctor as the technician-god of the human body. But in order to fix a machine, one must first know how it works; the doctor must be a diagnostician before a technician. Whereas medieval tradition forwarded the idea that all of creation was formed into signs for the benefit of humans, during London’s Great Plague the pestilent body was devastatingly silent. Often people were infected with the plague but, for lack of symptoms, neither they nor others knew it. Since the plague was incorrectly believed to be air-borne, this situation seemed to have the horrible practical consequence that man was helpless in stemming the spread of the disease. Confronted with the silence of the pestilent body, the doctor stepped into what had been god’s place in medieval tradition; from the seemingly (and deceptively) healthy body, the doctor elicited symptoms through such instruments and procedures as the microscope, forensic dissection, and experiment. Informed by both the medieval tradition and mechanistic medicine, the plague literature examined in this chapter echoes a providential world in which God communicates to humans for their benefit while at the same time articulating a pestilent world grown silence in which human bodies express their diseases through man-made signs.

By 1665, the Scientific Revolution with regards to medicine was well under way, combining a “new experimental method...with a successful mechanical model of the universe” (Baer 75). Thomas Sydenham, a doctor who lived during the plague, has been named the “primary representative of th[is] new direction in medicine” (Baer 72). Yet, while Sydenham, “the English Hippocrates [who] freed clinical medicine from the last
vestiges of medievalism” (Dewhurst, vii), was representative of medicine’s new
direction, his writings are not representative of those written by his contemporaries.
Many of Sydenham’s contemporaries remained “unliberated,” their writings including
numerous elements of “medievalism” alongside the nascent mechanistic medicine.

One aspect of “medievalism” found in the plague writings is a close relationship
between the physical and spiritual realms.\footnote{141} The medieval medical tradition took both
body and spirit into consideration when diagnosing and treating illness. In the plague
treatises, the physical and spiritual realms are treated as operating according to
substantially similar principles, often acting on one another directly.\footnote{142} For example, in
his enumeration of the “presagers of the plague,” the apothecarist William Boghurst notes
that one such harbinger is “[u]rine shadowing blacke after 3 or 4 dayes being sicke, also
bloody coloured unless caused by applying cantharides.” Boghurst directly follows this
presager “29” with presager “30:” “Melancholy, sad and frightfull dreames” (23).

\footnote{141} As we have seen in the previous chapter’s discussion of Boyle, the mechanical
philosophy had no room for the spiritual in the physical realm of (secondary) causation;
the “Mechanical philosophy’ of nature…attempted to separate the psychic and the
spiritual from the physical and material and to establish, within the realm of natural
philosophy, the autonomy of material causation” (Westfall 100).

\footnote{142} In Donne, the spiritual and physical realms are substantially linked through “being.”
But by the time of Boyle, the two realms are cut off from one another. For Boyle, the
physical realm consists of matter and motion, the spiritual realm does not, and the
operations that take place in one realm do not hold for the other.
Boghurst does not differentiate between these seemingly radically different phenomena, between urine and dreams, placing them into different categories of “presagers,” for example. Instead, he lists one after another as numbers 29 and 30 in a simple enumeration of 46 such presagers.

In much of the plague literature, such substantial similarity between physical and spiritual phenomena is taken for granted in much of the plague literature in all aspects of medical practice—not only in prognosis, as illustrated above, but also in etiology and treatment.

Although the plague’s ultimate cause was God’s wrath—the “plague was a divine scourge, a retribution for the sins of mankind” (Slack 114)—God did not act directly. Instead, Divine Providence “worked its purposes through natural causes” (Slack 114), both physical and spiritual ones. For example, “individuals could be temperamentally prone to plague because of an imbalance in their humors. But they also made themselves vulnerable by the abuse of God’s gifts by neglecting the golden mean in their behavior” (Slack 115). Causality is ambiguous here—does moral imbalance (“neglecting the golden mean”) contribute to humoral imbalance, which in turn makes the person “prone to plague,” or does moral imbalance directly make the person “vulnerable” to the plague? Or maybe both are true. Another example of such ambiguous (or overdetermined) causality is evident in the numerous accounts given of people who did not simply die of fright, but who died of the plague, itself caused by fright. This common belief was not simply the product of imaginations overwrought with despair and fear, for it is even found in the diaries of Samuel Pepys, who remained so levelheaded during the plague that “with death all about him” he still “managed to have a good time” (Taylor 105). As
Pepys recounts: “Alderman Bence stumbled over a corpse in the street and, going home and telling his wife of the experience, she at the fright...fell sick and died of the plague (August 9). While such spiritual causes of the plague are found in the plague literature, the importance of such causes are overshadowed by mechanical causes, such as atoms infecting through local motion: “From [the mouth and skin] therefore the Air will be impregnated with pestiferous atoms: which being taken into the Body of a found person will, in the Nature of a Ferment, put the Fluids there into the like Agitation and Disorder” (Mead 44).

With regard to treatment, spiritual and mechanical measures alike were recommended. Since God’s wrath was the plague’s ultimate cause, “repentance and prayer were...universally recognized as the proper and first recourse against an epidemic of plague” (Slack 114). Yet, as a contemporary author notes, this spiritual treatment was administered alongside a battery of physical ones, and “the Government...to the duty of public prayers, neglected not to add what assistance might be had from medicines” (Nicholson 107).

In addition to the close, causal relationship between spiritual and physical realms, another aspect of medievalism found in the plague texts is the episteme known as the “doctrine of signatures.” Ian Hacking illustrates this doctrine by referring to the work of the sixteenth-century doctor Paracelsus, who treated disease “by similarity:” for example, “[t]o cure the liver treat with a herb that is shaped like a liver” (42). As Hacking notes, “any theory that treats disease by similarity will require a theory of similarity,” and the doctrine of signature provides just such a theory (42). According to this doctrine, the occult relations between things—for example, the salutary relationship between a certain
herb and the human liver—is made known through surface resemblances. God forms these overt resemblances, or signs, for the benefit of humanity, so that knowing the true structure of the world we may make our way in it better.\textsuperscript{143}

Examples of this doctrine of signatures appear in the plague literature. Dr. Thomson’s “directions against the pest,” for example, recommend the “English toad” as a remedy for the swellings and tumors that appear on plague-infected bodies. Dr. Thomson has found that toads are helpful from his own experience of being sick with the plague (not once, but twice, recovering both times). Yet, he does not base his recommendation of the toad on such personal experience. Rather, he bases it on deduction from the principles of the doctrine of signatures: “[The toad] seems to be marked out, and to have a stigmatical Signature impressed upon it, to denote what a doral excellency is contained in it against a Disease that is often conspersed with a variety of spots (165-166).

In the plague literature such “deductive speculation,” the hallmark of medieval natural philosophy, exists alongside “inductive observation,” the hallmark of early-modern science—often in the writings of the same author. For example, while basing his toad recommendation on deduction using the doctrine of signatures, Dr. Thomson

\textsuperscript{143} Although the plague literature gives examples of cures and symptoms that are read precisely according to this doctrine, i.e., as resembling what they signify, the importance of this doctrine for our purpose is not in its strict application, but instead, in the worldview it implies, a world in which God has formed creation into signs that humans may read and thereby benefit. Thus, “signature” is defined more broadly than usual in this chapter, and includes all natural signs formed by God for man’s benefit.
recommends sulphur on the basis of observation and experiment: "common sulphur often sublimed with bay-salt decrepitated, affords an admirable Diaphoretick, promoting the circulation of the blood, as I have experimentally found" (Thomson 152, my emphasis).

During the plague, the doctrine of signatures played an important role not only in the treatment but also the diagnosis of disease. For at this time, symptoms were read in two distinct ways—namely, indexically and symbolically. Reading the symptom indexically is consistent with a mechanistic view of the body in that the symptom has no significance beyond its function to signal a breakdown in a physical system—i.e., the human body. An important aspect of the index is that there is no "intentional sender" of the sign (Sebeok, 216). The entire significance of a symptom, when considered as an index, is determined by its human interpreter; such a "symptom emerges as a sign...[only] through the organizing consciousness of the doctor" (Staiano, 332).

This dependence of the symptom on human interpretation for its meaning is not the case when the symptom is considered a symbol. For unlike the symptom considered as index, the symptom considered as symbol is the product of intention; it is a sign made by God, who communicates to man not only through symptoms but, according to the doctrine of signatures, the entire natural world.\textsuperscript{144} Read as symbols, symptoms are signs

\textsuperscript{144} The shift from reading symptoms symbolically to reading them syntactically is part of a larger shift that occurred during the Scientific Revolution, whose "fundamentally relational view of nature locates scientia—knowledge—not in the grasping of the inherent essences of individual things (as, for example, in Aristotelainism) nor in the correspondences and resemblances linking individual essences together into an
formed on the human body (and its products) that manifest some spiritual truth. An example of a symptom being read as a signature in the plague literature is Dr. Thomson’s earlier reflections on the color of his patient’s vomit. Thomson observes that the vomit is “tinged black,” its darkness signifying “the shadow of death” itself (113).

Often in the plague literature, symptoms are read both indexically and symbolically, evidence of two medical traditions existing alongside one another. This co-existence is neatly illustrated in Boghurst’s formulation of the symptom as a polysemic entity with two distinct meanings, depending on whether one reads the symptom as an index or a symbol. Considered indexically, exanthemata (black risings on the skin more commonly known as “tokens”) are “certain significations of the nature of the disease, of the truth of it, that it is the Plague, and the state and condition of the Patient” (47).

Considered as symbols, exanthemata are “tokens of God’s mercy” as well as expressions of “God’s wrath for sin” (47). They are tokens of mercy in so far as they forewarn people of death’s approach, “soe that they may have some hours to set their thoughts in order…to prepare themselves to meet their God” (47). However, they are also symbols overarching symbolic, but real, network, but rather, in the system of relations, operations, and actions that constitute the phenomenal world of things. The latter are not, in themselves, knowable as essences—that is, apart from the web of relations in which they are enmeshed. By contrast to the exegetical/symbolical approaches to nature I’ve described, this latter view of the language of things seeks knowledge of the ‘grammatical’ or ‘syntactic’ dimension of the language in which God has inscribed the book of nature” (Bono 264).
of God's just wrath, for "man, having made his soul like a leopard's skin by the guilt of multitude of sins, God to convict him of them makes his outward skin in the like case spotted" (47). Boghurst makes clear that this resemblance between the (physical) symptom and its (spiritual) cause is only one instance of a widespread phenomenon, noting that "here God punisheth according to the kind as hee doth often" (47; my emphasis).\footnote{This semiotic phenomenon was not only widespread, but also long-lived. Furthermore, this semiotic phenomenon had a long history behind it, reaching at least as far back as the sixth century A.D. For as the plague raged through France in 567, in the victims grew "lesion[s] in the shape of a serpent" (Crawfurd 86), the serpent shape of the lesion resembling, and thereby signifying, the disease's ultimate cause—namely, original sin in the snake's garden.}

Whereas the symptom as index signifies that the patient is physically ill, the symptom as symbol tells much more—it tells why the patient is ill, showing some spiritual significance in the disease.\footnote{This is not to imply that interpreting disease in spiritual or moral terms is a good thing. As Susan Sontag has shown with regard to both cancer and AIDS, such interpretations can be devastating.} Such symbolic symptoms wrote the meaning of one's death on one's very body. Yet, this meaning did not come as a surprise, as a revelation obtained only at the limit of physical existence. Rather, the symptom only told one what one already knew—namely, that one is doomed, along with the rest of humanity, to death through sin. Mechanistic medicine, with its rejection of such symbols
and the spiritual causes of disease they signified, has no reason to consider death as an integral part of human life, as "an evil inseparable from man" (Aries 605). In so far as the body is a machine, and the only teleology of a machine is to function, death lost all meaning, "Death became pure negativity. It would no longer have any meaning beyond the disease—identified, named, and classified—of which it was the final stage" (Aries 360).

While the plague literature shows numerous instances of reading symptoms as signatures (as in the leopard skin example given above) there is an even greater abundance of what are referred to as "generall" signs, or phenomena that are more clearly (to us) "signatures" in that they cannot be locally connected to the disease. Indeed, in the plague literature there is no distinction made between "generall signs," such as the omens that foretold the plague, and "particular signs," i.e., the symptoms manifested by the bodies of plague victims; these two types of signs are only distinguished by what they signify, not by the way in which they signify; whereas omens and similar cosmic phenomena are referred to as "generall" signs in that they signify the general phenomenon of the plague, symptoms are referred to as "particular” in that they signify a specific case of the general phenomenon, its manifestation in a specific human body (Boghurst 20).

For example, one phenomenon that was nearly universally accepted as a harbinger of the plague was "a blazing star or comet [that] appeared for several months before the plague." Even the skeptical narrator of Defoe's A Journal of the Plague Year provisionally accepts the reality of this sign, reading it as others did, as a signature that resembled what it signified: "the comet before the pestilence was of a faint, dull, languid
colour, and its motion very heavy, solemn, and slow...and that accordingly...foretold a heavy judgment, slow but severe, terrible and frightful, as was the plague” (28).

The medical treatises we have been examining show this demise of a natural world that expresses God’s intention to man. For in these treatises, indexical readings of symptoms far outnumber symbolic ones, and cures are more often based on induction from observation than on deduction through resemblance. The most dramatic account of this doctrine’s demise is found in Defoe’s A Journal of the Plague Year.

The world of the Journal is a world grown silent. Rather than a God who forms the world into signs for humanity’s benefit, there is a silent, wrathful God. The most poignant example of this silence for the Journal’s narrator is the silence of the pestilent body, the fact that while “[s]ometimes the bodies of carriers were marked with painful and obvious lesions—signs of infection that were easy to decode...more often than not, infection left no visible mark” (Rambuss, 124). In the execution of his duty as quarantine examiner, Defoe’s narrator is “forced to read what proves to be the most difficult ‘text’ engendered by the plague...[he] becomes a reader of human bodies” (Rambuss 124). Bodies were the most difficult texts to read because, as noted in this chapter’s opening, they often expressed nothing at all. The narrator manifests “interpretive panic over the inscrutability of the plague’s semiology,” and understandably so; for while “[h]uman bodies...must be correctly read (lives may depend on it) [they] persistently resist, even mislead, interpretation” (Rambuss 125).

The Journal narrator’s panic at the plague body’s “semiotic inscrutability” manifests itself in his obsessive treatment of the matter. Although many points are reiterated in the Journal, most repetitions are occasional, and tolerably distant from one
another. The issue of the plague body’s silence, however, is not only found throughout the text, but is restated in various forms for thirteen consecutive pages (187-199). This compulsive repetition has all the markings itself of a symptom—a symptom of anxiety caused by a worldview’s disintegration. This view is of a world providentially created and controlled, a world in which God has placed humans in the center and communicates with them through the rest of creation, including through their own bodies; it is the world of signatures. For the Journal’s narrator, plague-stricken London looks nothing like such a world. In the incomprehensible world of the plague, human bodies no longer speak to humans, manifesting the symptoms that might allow them to be treated and preserved. Rather, as humans unwittingly converse with one another their bodies insensibly communicate among themselves. People “secretly, and unperceived by others, or by themselves, communicated death to those they conversed with, the penetrating poison insinuating itself into their blood in a manner which it is impossible to describe, or indeed conceive (Defoe 197).

It was not only human bodies, however, that were silent during the plague years. Indeed, for some all of creation was coming to be seen as devoid of signatures. While Defoe’s narrator does give limited acceptance to the comet that signified the impending plague, in general he vehemently disregards such omens. He notes the people “poring continually at the clouds saw shapes and figures, representations and appearances which had nothing in them but air and vapour” (30). These people are trying to read meaning from the clouds, finding in them signatures of things to come: “coffins” and “heaps of dead bodies” (30). Such endeavors are motivated by the people’s “need to read the plague as meaningful in some way,” to hear from a God seemingly grown silent.
(Rambuss 122). The narrator, as eager to find meaning in the disaster as anyone else, "looked earnestly every way," but alas, "could not see the least appearance of anything" (32). He was not alone.

Rather than acquiescing in a world grown silent, many plague contemporaries took matters into their own hands and made the world speak. Defoe’s narrator reports on attempts during the plague to do just this—to create symptoms through human instruments such as the microscope and experimental procedures, including having a suspected person breathe on a cock to see if the bird dies (if it does, the person is infected and the bird is even worse off). Yet, the narrator’s belief in medicine and its ability to create meaningful signs out of God’s silent creation is ultimately overshadowed by the darkness of the plague; he concludes that “the nature of this contagion was such that it was impossible to discover it at all, or to prevent its spreading form one to another by any human skill” (Defoe 199).

This attitude, however, was not shared with the numerous apothecaries and doctors whose writings have been examined in this chapter. For these authors take an offensive attitude to the pestilence, figuring the situation they face in militaristic terms. The disease is something to battle against and defeat; but first, the enemy must be sought out through scientific technique: “Seeing therefore [that the plague] treads so softly within us, that it cannot be heard to walk, remains sometimes so silent, that it speaks little or nothing that we can understand for our instruction, ‘tis wisdom to send out some *Exploratores perspicies*, subtle Scouts, I mean, exquisite medicines that…may search out and discover whatsoever is hostile in our Territories, beating up the quarters of that close Enemy which lies in perdue to destroy us (Thomson 162). The ideas expressed in this
quote characterize the direction in which medicine was moving at the time. By the end of the seventeenth century a battery of diagnostic techniques and instruments had emerged, including “animal experiments, post-mortem examinations, chemical analyses of the body fluids, [and] studies in gross and microscopic anatomy” (Dewhurst 65). With the help of these, the body came to express symptoms that “would not have existed had it not been for the [human] production of them” (Staiano 113) and, in doing so, man helped himself in combating disease and staving off death.

The infected plague body devoid of symptoms was an exemplary and emotionally charged instance of a natural world that was growing increasingly silent during the seventeenth century. Echoes of a world speaking the message of a benevolent God can be heard in the plague literature. Yet, the predominant world-view expressed in this literature is the one forwarded by mechanistic medicine, in which humans make nature—most especially, the human body—speak the language of science, producing signs and symptoms through human techniques and instruments.
Conclusion

One of the hallmarks of the Scientific Revolution is the "secularization of consciousness, its turning away form transcendent goals to immanent aims, that is, in the replacement of the concern for the other world and the other life by preoccupation with this life and this world" (Koyré 1). This "secularization of consciousness" might not have been so much a matter of man’s intentional "turning away from transcendent goals" in his study of nature, as a matter of nature’s "turning away"—or rather, being turned away—from these goals by changes in worldview brought about by the Scientific Revolution. The preceding chapters have shown how the shift from a logos- to a will-based cosmology facilitated adoption of the mechanistic worldview that was crucial to the Scientific Revolution and allowed humans to predict and control better their natural environment. But we have seen that this shift also meant that this world—no longer an intelligible process ultimately related to God’s eternal being but rather the contingent effect of an ongoing, arbitrary exercise of God’s will—could no longer bear testament to anything transcendent of its own functioning. As Bono observes, proponents of the Scientific Revolution viewed "nature as a text in which God had inscribed, not His deepest mysteries, but merely His scheme for the order and functioning of created things" (82). Whereas the patristic Tertullian views Scripture as the "supplemental instructor" of a transcendent truth first taught to man by nature—namely, God’s intent to resurrect him—for the sixteenth-century Galileo "The Book of Nature...reveals only how nature carries out God’s commands. It tells us nothing about God’s intentions or about heaven. For the latter, we need His other book, the Scriptures" (198).
In a realist ontology, all natural processes are qualitatively determined by the essence or “form” of the creature undergoing the process. According to such a view, “nature is made of substances differing in quality and acting heterogeneously; earth naturally moves towards the center, fire away from the center, etc.” (Collingwood 98). In a nominalist ontology, on the contrary, a creature’s essence does not determine its motion, but instead, it is motion that creates the body’s “essence” or form: “Local motion is the chief determinant of the form of a natural body. The form, in turn, determines the qualities associated with that sort of body” (God and Nature). In other words, “for the new cosmology there can be no natural differences of quality; there can only be one substance, qualitatively uniform throughout the world, and its only differences are therefore differences of quantity” (Collingwood 98).

How this shift away from qualitatively-determined to quantitatively-formulated motion affects this world’s ability to express metaphysical meaning is evident in Donne’s

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147 “What is real and intelligible in nature is that which is measurable and quantitative... qualitative distinctions... have no place in the structure of the natural world but are modifications produced in us by the operation of determinate natural bodies on our senses. Here the doctrine of the mind-dependent or merely phenomenal nature of secondary qualities, as taught by Locke, is full-grown” (Westfall 102).

148 The type of purely quantitative math important to science (in distinction to the quality-laden math of neo-Pythagoreanism) is “useful for describing the regularities that hold between the actions of bodies, but it could not provide natural philosophers with the reasons why bodies act as they do” (Boyle Reconsidered 60). Of course, the new,
and Boyle’s very different understandings of “corruption.” Donne’s view of corruption, as we have seen, presupposes an essence or essential nature or “level of being” from which the creature degenerates and to which it will be restored.\textsuperscript{149} Boyle, on the other hand, views corruption in the same way that he views all material processes—not as the expression of (or degeneration from) an essential nature inhering in the matter, for such a nature does not exist. Since there is no “essence,” or essential nature of a creature, in relation to which qualitative judgments could be made, all processes are metaphysically indistinguishable to Boyle; whether a process is referred to as a corruption, a generation or a destruction is a matter of human knowledge and linguistic convention—being based scientific philosophers were not concerned about immanent purpose, or “why bodies act as they do.”

\textsuperscript{149} Of course, such an essence or form, as we have seen in Browne and the patristic writers, positively determines a creature’s growth and change. Donne, however, focused not on this aspect of form, but rather, how man, through an act of free will (which is outside the hierarchy of being or forms) can “degenerate” from the form in which God created him. Browne expresses this dual aspect of form thus: “Time, which perfects some Things, imperfects also others. Could we intimately apprehend the Ideated man, and as he stood in the intellect of God upon the first exertion by Creation, we might more narrowly comprehend our present Degeneration, and how widely we are fallen from the pure Exemplar and idea of our nature: for after this corruptive Elongation from a primitive and pure Creation, we are almost lost in Degeneration” (\textit{Christian Morals} 1.28).
on only a grouping of secondary qualities by whose presence or absence humans have
determined to differentiate one thing from another: “But neither in this [putrefaction] nor
in any other kind of corruption is there anything substantial destroyed (no such thing
having been produced in generation, and matter itself being on all hand acknowledged
incorruptible) but only that special connexion of the parts or manner of their co-existence,
upon whose account the matter (whilst it was in its former state) was, and was called a
stone, or a metal, or did belong to any other determinate species of bodies” (“Origin of
Forms” 36-37).

In realist natural philosophies, the natural world proceeds towards the end
established for it at its creation; man’s end, Donne, Browne and the patristic authors were
certain, lied in a next world. Certainly, Boyle views God as in charge of the world’s
movements, and even fulfilling by them his will; Boyle “considered finality to be
imposed supernaturally by a providential god. The purpose evident in natural processes is
divine purpose, imposed from without” (Osler 162). Yet, this divine “purpose” is
contingent to creation and thus not knowable through it (whereas in the realist ontology if
one knows a thing’s essence one also knows where it is headed). Accordingly, the study
of nature for Boyle did not include serious consideration of such purpose; while “to
inquire to what purpose nature would have such or such effects produced, is a curiosity
worth of a rational creature, upon the score of his being so: but this is not the proper talk
of a naturalist, whose work, as he is such, is not so much to discover, why, as how,
particular effects are produced” (v.443).

The mechanical philosophy “established nature as a self-contained, self-
regulating, law-governed system which can be likened in its interrelations to a machine”
(Shanahan 550). And while early proponents of the Scientific Revolution such as Bacon and Boyle continued to motion towards God as the machine’s maker and even sustainer, it was inevitable that “as nature came more and more to be conceived as a system of laws relating matter and motion, the doctrine of divine providence declined in importance…in natural philosophy” (Shanahan 550).

In realist natural philosophies, God’s providence had a place in nature and its study—for it was his providence that was expressed through natural forms; this place was lost in the natural philosophy of the Scientific Revolution. It is not surprising, then, that the notion of God changed; from a Creator that has particular concern for each creature that partakes in his being, God becomes “an abstract principle at the end of a chain of secondary causes” (Jones 374). Whereas Athenagoras knew that “all created things need the care of their Maker, each one in its own way, in accordance with its own nature and its own end” (133), Boyle felt God to be more concerned with the “catholic rules of motion” than the fates of individual creatures: “[God] settled among his corporeal works general and standing laws of motion suited to his most wise ends, it seems very congruous to his wisdom to prefer (unless in the newly excepted cases [of miracles]) catholic laws and higher ends before subordinate ones, and uniformity in his conduct before making changes in it according to every sort of particular emergencies [sic]; and consequently, not to recede from the general laws he at first most wisely established to comply with the appetites or the needs of particular creatures, or to prevent some seeming irregularities (such as earthquakes, floods, famines, etc.) incommodious to them” (Enquiry 161).

Yet, as we have seen, this silencing of the natural world with regard to God’s intentions had some positive effects as well, in that this world could be better managed
and human life prolonged. For once the world is no longer seen as having an immanent purpose—for Christian theology, one sustained by and directed back to God—space is made in that world for realizing human purposes.  

Relatively, once nature is no longer seen as constituted by signs expressing God’s intention, humans are free to use nature to create their own signs in service of realizing their own ends, as we saw the beginnings of in the plague literature.  

But death can only be delayed, not avoided. So while the mechanistic worldview fostered the development of techniques to lengthen human life in this world, in so far as it gave away any security with regard to the next, it may have been short-sighted: “And if a few years respite could by a scrupulous and troublesome use of diet and remedies be obtained; yet that, in comparison of the eternity, that is to follow, is not at all

\[\text{150} \] The Aristotelian distinction between art and nature depended on seeing human purposes as separate from natural ones and hence irrelevant to the creation of a true natural philosophy. For Bacon, by contrast, human purposes were paramount: his natural philosophy aimed at creating knowledge of how to achieve human ends. An independently existing realm of natural purposes thus became a strictly irrelevant category” (Discipline and Experience 155).

\[\text{151} \] “Knowledge of nature, rather than being about identifying purposes, is now, insensibly, becoming about characterizing ‘rules’ (or what in the seventeenth century were increasingly called ‘laws’) of nature. The rules governing nature’s behavior take the place of the purposes for the sake of which that behavior occurs” (Discipline and Experience 157).
considerable. But whereas within no great number of years, (a little sooner, or a little later) all the remedies, and reliefs, and pleasures, and accommodations, that philosophical improvements can afford a man, will not keep him from the grave...the benefits, that may accrue to us by divinity, as they relate chiefly, though not only, to the other world; so they will follow us out of this, and prove them incomparably greater than ever, when they alone shall be capable of being enjoyed” (iv.41).
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