Lucretius on the Nature of Things

by

Margaret Kirby

A lecture given at St. John's College in Annapolis on the 13th of April 2012.

Lucretius on the Nature of Things

De rerum natura or *On the Nature of Things* presents itself as a project to convert a Roman citizen named Memmius from his faith in the civic religion of Rome to the "true reasoning" (*vera ratio*) embodied in the teachings of the Greek philosopher Epicurus.[1] This civic religion, Lucretius maintains, and especially the fears it inculcates in the minds of its adherents, are responsible for the unhappy condition of late Republican Rome: the urgent prayer for peace with which the work opens and its reference to "our country's time of trouble" locate the poem amidst the civil disturbances and foreign wars of conquest that characterize the last years of the Republic.[2] Lucretius fully acknowledges the difficulty of the project: his fundamental tenet that the universe consists of nothing but "body and void," his central precept of the soul's mortality, and his ongoing insistence on the utter indifference of the gods to all human affairs, constitute a bold attack on those religious convictions, on which, according to Polybius, the enduring strength of the Roman commonwealth depended.[3] The character of Lucretius' pupil only exacerbates the problem: Memmius is portrayed as a recalcitrant student, likely to reject with disdain any teaching he does not immediately understand,[4] and prone to bouts of inattentiveness—although the length of Lucretius' lecture no doubt invites such lapses. Moreover, Lucretius foresees that Memmius, "overcome by the fear-inspiring words of priests and poets," will try to cut himself off from Epicurean reasoning and revert to his former beliefs.[5] The fears instilled by priests and poets, Lucretius suggests, derive overwhelming power from a deeper and more fundamental human fear, which is rooted deep in the mind itself and in our very sense of causality. The eradication of this primary fear thus becomes key to the conversion of Memmius:

> Therefore this terror of mind and these shadows must be dispelled, not by rays of sun or bright shafts of day, but by nature's aspect and reason.[6]

Read actively, the phrase *nātūrae spĕcĭēs rătĭōque* refers to our "looking at and reasoning about nature." [7] At the same time it invites a less conventional reading, which suggests that it is not so much our observation and reasoning about nature, but nature's *own* visible and invisible processes— its "aspect and reason"—that will ultimately dispel the shadows and terror of the mind.

Fear is not by any means a human prerogative. Lucretius notes that animals utter distinct sounds of alarm "when they are in fear or pain."[8] Nevertheless, he claims that humans know—or are afflicted by—a peculiar kind of fear, which he calls "terror of mind" (*terror animi*; 1.146).[9] Such fear is unknown, however, to the first humans: "They did not seek the day and the sun all over the land with great outcry, nor wander *frightened* in the shadows of night…"[10] Early man has "cares" (*curae*; 5.982), but they are of a different—and more immediate—order: "They would flee their rocky shelters at the approach of a foaming boar or mighty lion and at dead of night would yield their leaf-strewn beds in fright to the savage guests."[11] At the same time Lucretius hints that these first humans are not, in fact, distinctly human at all. They pass their days in "the wide-wandering fashion of wild beasts,"[12] while their nocturnal ritual of "lay[ing] their wild limbs naked on the ground, [and] rolling themselves in leaves and boughs," makes them "the equals of bristly hogs."[13] It seems that only in becoming fully human does man become infected with the darker terrors of the mind, or perhaps rather that man becomes truly human precisely *by* acquiring these dark fears:

> For when we look up at the celestial regions of the great world, at the ether set with glittering stars, and it comes to our mind [to think] of the paths of the sun and moon, then, into breasts bent down by other evils that care also begins to raise its wakened

> head, whether by any chance we have to do with some immeasurable power of the gods, able to make the bright stars revolve…[14]

The imagery of this passage is telling.[15] Into breasts bent down by "other evils" a new kind of care is said to make its restless way: this care is depicted as "erecting" or "raising" a head that has been "wakened" or "made erect."[16] The image of a personified care raising its head and rising from sleep suggests that as soon as humans, in Ovid's words, "raise erected faces to the stars," that is, as soon as they begin to stand upright and quite literally raise their heads from the ground, they awake to a new kind of concern.[17] Although an animal instinct for survival may initially position humans in the world, Lucretius suggests that it is man's question about the causes of celestial phenomena that gives rise to the first fully human fear, or again, that such fear is what first gives birth to a distinctly human kind.

But what exactly *is* this fear? The "mind's terror" has its origin in a fundamental human desire to discern the causes of things: "…they observed how the sky's array and the various seasons of the year come round in due order, and were not able to discover (*cognoscere*) *by what causes* all that came about."[18] We experience things as *effects*, as caused. We see "many things" and immediately try to *see causes* of the things we perceive. The problem is that causes generally don't appear *ante oculos*, "before our eyes."[19] The absence of any visible cause of the regular motions of the heavens or the recurrent pattern of the seasons thus fills humans with a kind of awe:

> In this way, certainly, dread holds all mortals in bond, because they behold many things happening on earth and in the sky, the *causes* of whose workings they can by no means *see*, and they think them to be done by divine power.[20]

Thus the celestial phenomena raise questions of *causality* and, as a result, the notion of a powerful agency comes to form part of man's very experience of the revolving "moon and day

and night and solemn stars."[21] As a result, the question, "whether by any chance we have to do with some immeasurable power of the gods, able to make the bright stars revolve," can only be framed as a rhetorical question. Incapable of experiencing the celestial motions except as effects, except as caused, humans immediately posit occult agents: "their refuge was to leave all in the hands of the gods, and to suppose that by their nod all things were done."[22] Having created gods more or less in their own image, humans also attribute passions resembling their own to the gods, and interpret destructive natural phenomena as effects of divine anger: "Oh unhappy race of mankind, to ascribe such doings to the gods and to attribute to them bitter wrath as well!"[23] However regrettable such a response may be, it is, apparently, an altogether human reaction:

> Whose mind does not shrink with dread of the gods, whose limbs do not crawl with fright, when the scorched earth trembles at the thunderbolt's terrible blow? […] when the whole earth sways under our feet, and shaken cities fall and threaten to fall as they waver, what wonder if mortals feel contempt for themselves and acknowledge in these things the gods' great powers and wondrous strength, which govern all things?[24]

The visceral quaking[25] that makes men flee wild boars and lions thus comes to be replaced by less instinctive and more complex fears. The belief that divinities govern the world and the religion to which this belief gives rise are the origin of the deepest fear that "assails" men.[26] This is "the sharp fear of death;"[27] it is

> that fear of Acheron…which troubles the life of man from its deepest depths, suffuses all with the blackness of death, and leaves no delight clean and pure.[28]

This new fear, fueled by the "immortal verse" of poets,[29] is not so much a fear of death itself, as the fear of an imagined afterlife and an illusory future beyond death.[30] Paradoxically, this fear is associated with a profound failure to grasp the full extent and significance of human

mortality. Men mistakenly imagine that the soul is immortal and in doing so fail to *distinguish* properly between mortal and immortal:

> …to join mortal with eternal, and think that they can feel as one and suffer in common is madness. For what can be thought more at variance, or more disjoined in their relation and inconsistent, than what is mortal joined in union with immortal and everlasting, to weather furious storms![31]

The same logical error gives rise to the misguided notion that the gods are involved in human affairs. To suppose that immortal beings concern themselves with the doings of mortals is to overlook the essential distinction between temporal and eternal: "for the very nature of divinity must necessarily enjoy immortal life in the deepest peace, far removed and separated from our affairs."[32] Ultimately, then, the fear of death stems from a failure to grasp the essential *finitude* of all things and a failure to observe "how the power of each [thing] is limited and in what way its boundary stone is deep-fixed."[33]

Under the shadow of this new fear of death, humans invent elaborate religious rituals, which, ironically, cause them to turn their eyes away from the celestial motions that first aroused their wonder and "turn towards stones and altars."[34] They abandon their distinctly human, vertical posture and "fall prostrate upon the ground" in worship.[35] It is in fact in this attitude that Epicurus is said to have found them:

> …human life lay groveling on the earth, bent down (*oppressa*) under the weight of religion, which stretched out its head from the regions of the sky, standing over (*super*…*instans*) mortals with terrible aspect…[36]

Humans have themselves personified the "regions of the sky," so that these now appear not as the orderly array which first aroused men's wonder, but as the locus of divine powers; the sky acquires the frightening "aspect" or "look" of gods who must be propitiated.[37]

Indeed Lucretius observes that his Roman contemporaries seldom raise their heads to the sky at all. Preoccupied as they are with mundane affairs, they are more likely to catch a glimpse of the sky's reflection in a shallow puddle between the paving stones at their feet, "so that [they] seem to look *down* on (*despicere*) clouds and sky," than they are to gaze up in wonder at the source of this image.[38] He asks Memmius to imagine how "wonderful" the "sight" or *species* of the stars and sky must appear to those seeing them for the first time, although "no one now, wearied with satiety of seeing, deigns to look *up* (*suspicere*) at the bright regions of the sky."[39] As humans lose sight of the original cause of the mind's terror, this terror too loses its focus on externals and becomes a permanent inner condition, characterized as "anxiety of heart."[40] This anxiety expresses itself as a profound restlessness: "each seeks always to change his place, as if he could put down his burden."[41] The more men attain the public success they think will free them care, the more oppressed they in fact become: "so great a mass of ill lies heavy on their breast."[42] For all their sophistication, the citizens of Rome are so bent by onerous cares that, metaphorically at least, their very ability to stand erect is threatened.

We have already noted that contemporary Roman religious practices present a more literal threat to man's ability to stand "erect and tall," to use Milton's phrase.[43] In contrast to a religion (*religio*) that only inculcates false fears, Lucretius advocates an attitude of piety (*pietas*) which he explicitly distinguishes from prevailing Roman notions of piety:

> It is no piety at all to be seen often with covered head, to turn towards a stone and to approach every altar, nor to fall prostrate upon the ground and to spread palms open before the shrines of the gods, nor to sprinkle altars with the streaming blood of four-footed animals (*quadrupedum*), nor to link vow to vow; but rather to be able to look on all with a mind at peace.[44]

But how is such *Lucretian* piety, or tranquility of mind, to be attained? How is man to recover his proper attitude? Lucretius suggests that it is, once again, a question of etiology: "He is sick because he does not grasp the cause of his disease; if he could see that well, at once each, his affairs abandoned, would first strive to discover (*cognoscere*) the nature of things."[45]

De rerum natura thus associates the ethical ills and political turmoil of Rome's "time of trouble" with a profound ignorance about "the nature of things." Both the fear of death and the civic vices generated by this fear ultimately spring from misconceptions about the nature of *body*, misconceptions the poem proposes to correct. In addition to presenting the Epicurean teaching that nothing exists apart from body and void, the first book of the poem refutes the views of a number of Greek natural philosophers and, in particular, their accounts of the constitution of bodies. Although the three accounts that are rejected differ significantly from one another, all three are presented as assuming that the constitution of the physical world is more or less faithfully reflected by our experience of that world. According to this view, the first principles or ultimate constituents of the physical world resemble substances with which we are familiar. The physics of *De rerum natura*, by contrast, emphasizes a radical *discontinuity* between the world we perceive and the basic composition of that world.[46] The phenomena we experience, it turns out, do not simply mirror or *mimic* an underlying "reality," but *conceal* its immutable nature beneath their own ever-shifting "look" or *species*. There is, in other words, a profound gap between the world of our experience and its underlying principles. Yet although the phenomena are not literal translations of nature's constitutive principles, Lucretius nevertheless insists—in marked contrast to the early Greek atomists Democritus and Leucippus—that, the phenomena are *not* simply false or specious,[47] and do in fact provide

"traces" by which the "keen-scented mind" can "come to know" (*cognoscere*; 1.403) the truth of things (*verum*; 1.409). It is important, however, that we first consider this fundamental disparity between the world of our experience and its eternal elements.

The realm of human experience is a strange blend of chaos and order, of change and permanence. On the one hand, everything we experience continually alters: "nothing remains like itself; all things move; nature changes all, compels all to alter."[48] Indeed our very perceptions of things arise from their relentless disintegration, as all sensation depends on the incessant streaming of matter from things: "from all things each thing is carried off in a stream […], and no delay or respite is granted in this flux, since we have sensation unceasingly."[49] On the other hand, Lucretius is adamant that this fluidity is not the end of the matter and sharply criticizes the Heracliteans for failing to see that "something must remain safe and sound in those fires of theirs."[50] Things also exhibit remarkable regularity: "all things are so *constant* that from generation to generation all the variegated birds display on their bodies the markings of their kind."[51] Our very notion of a *thing* involves membership in a kind: "no thing (*res nulla*) is single (*una*)… so as not to belong to some kind and to be one of many like it."[52] Thus, although no one kind is permanent, generic identity belongs to our experience of *things*. Our ability to perceive kinds, to see pigeons and peacocks,[53] is the result of certain unchanging "ordinances of nature (*foedera naturae*)."[54] These governing principles are not the work of a provident legislator, but are embedded in the unchanging structure of matter itself.[55] Because it belongs to the very nature of a *thing* to exhibit generic constancy, such constancy must somehow be a constitutive part of things themselves: "they must also have beyond a doubt a body of immutable matter."[56] This insight underlies Lucretius' central claim that both the things we

experience *and* the principles that constitute those things must be *corporeal*: "Bodies are partly the *primordia* of things, partly those which are formed by the union of *primordia*."[57]

At the same time Lucretius draws a sharp distinction between the world we experience and the immutable first principles that underlie this world. A *thing* is always a possible object of experience, while the unchanging first principles, on which the existence of things depends, are never themselves objects of sensation or experience. There are, then, two very distinct sorts of bodies. The "bodies" which constitute the elements or *primordia* of things are not the bodies of our experience; *primordia* are not *things* but rather "beginnings" or "first bodies" of things. Although both the *primordia* and the unions of *primordia* are *bodies* or *corpora*, the *primordia* are not *things* or *res*. [58] Indeed, Memmius is instructed particularly to keep in mind that a *thing* cannot consist of a single kind of atom: "Of things whose nature is plainly seen, there is none that consists of only one kind of element, nothing that does not consist of thoroughly mixed seed."[59] While everything we perceive is an unstable composite of matter and void, of *primordia* and empty space, the *primordia* themselves constitute the "immortal foundations" of this world. Every edifice constructed of matter and void lacks stability—every compound is by nature transient—but the building stones themselves are indestructible. Unlike the prime matter of Aristotelian physics, which eludes our knowledge as it hovers between being and non-being,[60] the Lucretian *primordia,* solid, simple, and "strong by their eternal simplicity,"[61] are clearly distinguished from non-being, which presents itself alongside them as void.

Unfortunately, the very immutability that gives the atoms such an ontological advantage calls their epistemic status into question. Although it is a central tenet of Epicurean philosophy

that all knowledge is grounded in sensation,[62] the *primordia* are never objects of sensation. Like Epicurus, Lucretius stresses the necessary primacy of sense perception:

> …unless our belief (*fides*) in sensation is first firmly founded and strong, there will be no principle of appeal in hidden matters, according to which we may make anything firm by reasoning of the mind.[63]

Sense-certainty seems axiomatic; we cannot, for example, deny our perception of body: "for that body in itself exists, sensation, common to all, declares."[64] Indeed, to demand grounds for the certainty of sense perception is simply misguided: "For to what shall we appeal? What can we find more certain than the senses themselves, with which we can distinguish true things from false ones?"[65] Sense-certainty, however, is founded on "belief" rather than knowledge.[66] While this might lead us to conclude that sense-perception is a doubtful starting point for one who seeks "to know the nature of things," we are strongly cautioned against falling into such skepticism:

> For not only would all reasoning fall to ruin; our life and safety too would immediately collapse, unless you dare to trust the senses… [67]

Yet despite insisting on the authority of sensation and asserting that the concept of truth is itself empirical in origin, Lucretius repeatedly affirms that the atoms are imperceptible: "the *primordia* cannot be discerned with the eyes"; they "cannot be seen." [68] At times it seems as if the problem is simply that the *primordia* are too small for our senses to detect: "the *primordia* are so far below our senses and so much smaller than the point at which our eyes begin not to be able to see."[69] Nonetheless, although the primordia are certainly far smaller than anything our eyes can discern, our inability to perceive them does not stem, or at least does not stem primarily, from the weakness of our vision. Rather, invisibility belongs to the very nature of the *primordia*:

> The *primordia* ought in begetting things to bring with them a nature hidden and unseen, that nothing stand out which might fight against and bar whatever is being made from existing with its own proper being. [70]

The claim that the *primordia* must have a hidden nature forms the core of Lucretius' criticism of Empedocles and Anaxagoras. If the *primordia* have *sensible* natures, he argues, they will not *unite* as *things*, but simply *mix* in "variegated heap[s]":

> If by chance you think that the body of fire and the body of earth and the breezes of the air and the dewy moisture so combine, that in union no one of them changes its nature, you will see that no *thing* can be created out of them, no, not a living thing, nor one with lifeless body [...]. Each element in the mingling of this variegated heap will show its own nature, and air will be seen mixed together with earth, heat abiding with moisture.[71]

The reality and integrity of composite bodies can only be secured if we begin by distinguishing clearly between *things* and their underlying principles. Memmius must understand that the *primordia* are necessarily devoid of all accidental qualities:

> Come then, listen to words sought with sweet labor, lest by chance you suppose these white things which you see bright before your eyes to be made of white beginnings, or those that are black to be born of seed that is black, or that they are imbued with any other color you will because the bodies of matter are dyed with like color. For there is no color at all in the bodies of matter, neither like [the color of] things nor again unlike.[72]

Because the things we perceive are both relatively stable (as *genera* or kinds) *and* mutable (as particulars), they must be composites of primary and secondary qualities. Yet this stability (and the truth of our experience) can only be guaranteed if things are constituted of elements completely *distinct* from the particular objects of our experience. To constitute fire, air, water, and earth as the elements of things, as Empedocles did, is to fail to grasp the need for such a distinction.[73] Anaxagoras falls into a similar but even more egregious error in proposing principles that simply mimic things themselves:

> …he clearly holds that bones are made of very small and minute bones, flesh of very small and minute particles of flesh, and that blood is composed by the coming together of many drops of blood, and he thinks gold can consist of tiny bits of gold, that earth grows together from little earths, that fire is made of fires, water of waters; he fancies and imagines the rest in the same way.[74]

In other words, Anaxagoras "imagines" first principles that are essentially derivative and thus simply too weak—too mutable—to sustain the structure of our experience:

> Add that he imagines *primordia* which are too weak, if indeed those are *primordia* which are endowed with a nature similar to the things themselves, and equally suffer and pass away...[75]

Lucretius notes that although his own argument focuses on the sense of sight, we are to understand that the *primordia* equally elude our other senses:

> …the *primordia* of things must not contribute any odor of their own to the making of things, nor any sound, since they can emit nothing from themselves, and similarly no taste at all, nor cold, nor heat again and moderate warmth, and the rest: all these […] must be kept apart from the beginnings, if we wish to lay an imperishable foundation for things upon which the sum of existence may rest. [76]

The relation of the *primordia* to our sense of touch, however, is somewhat more ambiguous. Tangibility is identified an *inseparable* property of body itself: "An inseparable property (*coniunctum*) is that which without destructive dissolution can never be disjoined and disengaged (*seque gregari*), as weight is to stone, heat to fire, liquidity to water, touch to all bodies, intangibility to void." [77] At the same time, tangibility is the basis of all sense perception: "For touch, so help me the holy power of the gods, it is touch that is the bodily sense…"[78] Although, as we've seen, Lucretius emphatically rejects the pre-Socratic endeavor to associate the first principles with any objects of sense experience, we've also seen that his first principles do nevertheless bear an important resemblance to the things we experience: the *primordia* are *bodies*.[79] On the one hand, then, as part of his effort to *distinguish* the *primordia* from the

particular, mutable objects we experience, Lucretius devotes considerable time and effort to demonstrating that the *primordia* are devoid of all secondary qualities. On the other hand, to ensure that they can adequately account for our experience of the physical world, he insists that the *primordia* must possess the essential properties of body and ascribes to them size, shape, and weight, in addition to duration, unity, and impermeability. To some extent, then, the *primordia do* resemble the bodies we experience. Nonetheless, despite having posited tangibility as an essential attribute of body, Lucretius contends that the *primordia* themselves do *not* affect our sense of touch. They are, first of all, simply too small to affect our sense of touch: the particles that constitute the soul or *anima* are said to be too far apart to be moved by bodies as minute as the *primordia*.[80] Yet the intangibility of the *primordia* does not seem to be simply an effect of size. In rejecting the Heraclitean theory that fire is the primary substance, Lucretius expressly states that the "first bodies" are *not* like anything "that is able to send bodies to our senses and by throwing something toward it to touch our touch."[81] Moreover, qualities that seem fundamental to our sense of touch—heat and cold—are expressly listed as accidental qualities that *cannot* be predicated of the "first bodies:" "they are also altogether destitute of warmth and cold and strong heat..."[82] Thus the *primordia* elude even our sense of touch. While the constant streaming of *primordia* from composite bodies creates a kind of field effect which *causes* sensation, the *primordia* are never themselves *objects* of perception. The perception of things depends entirely on the *motion* of the *primordia*.

The claim that the constitutive principles of things are not simply minute *sensible* bodies promises to grant compound bodies an integrity they lack in the pre-Socratic accounts Lucretius criticizes. Paradoxically, however, this *difference* between composite bodies and their

constituent elements threatens the very existence of compound bodies. It does not seem possible to claim *both* that the *primordia* are self-subsisting realities *and* that compound bodies are real substances, rather than mere mixtures or even illusory appearances. As Aristotle puts it, "A substance cannot consist of substances present in it in complete reality; for things that are thus in complete reality two are never in complete reality one."[83] Unless we can demonstrate how independent atomic substances *unite* to form real substances rather than mere mixtures, we seem to face yet again precisely the problem atomism aimed to address. The *primordia* are, after all, completely devoid of any relation to one another—there are neither attractive nor repulsive forces in a Lucretian cosmos. Although it is said to be a basic property of all bodies, a "duty" (*officium*) of body, as Lucretius puts it, to "press down," this motion is not the result of attractive forces.[84] Moreover, while the *primordia* relentlessly carry out this task, it is not at all clear what all this activity means. By asserting that the *primordia* have weight in addition to size and shape, Lucretius proposes that motion belongs to the very nature of the *primordia*: "For first the *primordia* of things move of themselves."[85] This would seem to contradict his earlier insistence on the utter immutability of the *primordia*—change of place is, after all, a change—but it turns out that this innate primordial motion does not in fact constitute change: it is, as it were, an unmoving motion. Anticipating Galileo, Lucretius maintains that the *primordia* all fall at the same speed: "through the motionless void they must, with weights not equal, all be carried *with equal motion*."[86] We are invited to envision a sort of primal rain, as the *primordia* fall through the void in parallel lines at constant and equal speeds.[87] As far as their innate downward tendency is concerned, the *primordia* have no motion whatsoever in relation to one another. Thus weight can never account for collisions, let

alone conjunctions, of atoms. The infinity of space guarantees their rectilinear motion throughout infinite time—"remember that there is no bottom in the sum of things and the first bodies have nowhere to rest, since space is without end or limit."[88] Nor do the *primordia* move in relation to the whole: no matter how far they travel, the *primordia* cannot change location with respect to the infinite "sum of things." Such motion, in other words, differs little from rest and hardly explains how *things* arise from their atomic foundations. Given eternal *primordia* moved by weight alone, Lucretius acknowledges, "nature would never have produced anything."[89]

This difficulty gives rise to the famous—or indeed infamous—doctrine of the swerve. In light of the poem's emphasis on nature's rationality and intrinsic lawfulness, it is startling suddenly to discover that nature in fact brings things into being[90] by means of what one might call a principle of *uncertainty*:

> While the first bodies are being carried downwards by their own weights in a straight line through the void, at some quite *indefinite* time and in *indefinite* places, they swerve (*depellere*) a little from their course, just so much as you might call a *change* of motion.[91]

There simply seems to be no rational explanation that can "save the appearances." The *primordia* can only unite and function as *causes* of things if they are allowed to deviate invisibly and ever so slightly from their eternal immutability—"just so much as you might call a change of motion." No matter how foreign it may at first seem to "definite reasoning (*certa ratio*)" and to our understanding of Euclid's fifth postulate, the "reason of nature" (*naturae ratio*) seems to include a kind of *esprit de finesse* that circumvents the *esprit de géométrie* to which strict logic would confine it.[92] The perpetual downward tendency of the *primordia* cannot by itself adequately account for *things*, which are *unions* (*concilia*) of atoms. Yet the notion that things

ultimately arise from and depend on random and completely invisible atomic digressions undermines the very "ordinances of nature" on which Lucretius promised to build his structure; the swerve seems to belong neither to the "aspect" nor to the "reason of nature." Insofar as our world of *things* depends entirely on this *unaccountable* ability of the *primordia* to sidestep the paths ordained by their weights, it seems that we cannot really give an account of this world—"for this we see to be plain and evident, that weights, as far as in them lies, cannot travel obliquely."[93] We seem to have overthrown the tyranny of divine masters only to replace it by the dictates of an inexplicable "inclination" or swerve, to have been freed from the dominion of capricious deities only to come under the governance of a random swerve.

Lucretius prefaces his presentation of the swerve by urging Memmius to envision the *primordia* as pugnacious dust motes, "struggling, fighting, battling in troops without any pause."[94] He exhorts Memmius to "turn [his] mind" particularly to this example.[95] If Memmius will but consider the endless "meetings and partings" of these dusty squadrons, he will be able "to *conjecture* from this what it is for the *primordia* always to be *thrown about* in the great void."[96] Here, as so often, Lucretius engages, or perhaps indulges, in a revealing word-play. He frequently uses the verb *conicere*—"conjecture"—in its literal sense of "throw together."[97] His use of a cognate form of the verb *iacere*—"to throw"—in this sentence clearly recalls this literal meaning. If Memmius—or the reader—is sufficiently attentive, he will grasp that the mental action involved in drawing analogies between dust motes, military squadrons, and *primordia* has much in common with the oblique motions that cause dust motes to collide. The movement of reason in drawing such analogies—and it is by means of such correspondences that we have access to the imperceptible *primordia*—seems to involve a kind of mental swerve

that deviates from the rectilinear paths strict logic demands. Not only, then, does the *reason of nature* (*naturae ratio*) demand that nature's constituent particles constantly be "thrown together," but the *nature of our reason* likewise involves "throwing together" notions that would not otherwise meet. Reason itself, that is, occasionally employs unpredictable and unorthodox motions.

It is important to remember that most collisions are no more productive than the comings and goings of so many dust motes. The swerve (coupled with the infinite supply of *primordia*) ensures that some atoms will collide, but collision alone does not account for the genesis of things. Whether or not the colliding *primordia* cohere depends on fixed laws of nature:

> It must not be thought that all can be conjoined in all ways, for then you would commonly see monstrosities come into being […] But that none of these things happen is manifest, since we see that all things bred from definite seeds by a definite mother are able to conserve their kind as they grow. Assuredly this must come about by a definite reason.[98]

A *thing* is not merely a mix, but above all an arrangement or configuration that depends on the shapes and motions of its constituent parts: "when the combinations of matter, when its motions, order, position, shapes are changed, the thing also must be changed."[99] Things can only incorporate those atomic particles that, in addition to having conformable shapes, are also able to coordinate their motions with the motions of the other constituent particles. The principles of compatible shape and motion constitute the fundamental laws that govern both living and non-living things: "But do not by chance think that living things alone are held by these laws, for the same reason limits all things."[100]

Although they form the ground of our changing phenomenal world and have all the conceptual rudiments of body, the *primordia*, as we have seen, are not phenomena in their own right. The *primordia* do possess size, shape, and weight. They also possess some sort of resistance: body is said to have a "duty" not only to press downward, but also to "work against and obstruct"—it is essentially tangible, although, as we've seen, a *primordium* is never itself the object of our sense of touch.[101] Finally, if we follow the arguments about the "extreme points" of the *primordia*, in turns out that they even have parts of a sort, albeit inseparable parts.[102] At the same time, the *primordia* remain as remote from the phenomena of our experience as immortal from mortal, as solid from soluble, as simple from complex. Are we not then back with just the problem we began with, namely the problem of occult causes? If so, there would seem to be little to recommend Epicurean lectures over priestly pronouncements. Anticipating this objection, Lucretius insists that imperceptible as they are, the *primordia* are nevertheless objects of *thought*:

> But if by chance you think that the mind cannot project itself into these bodies, you are wandering far astray. For since those born blind, who have never perceived the sun's light, nevertheless come to know (*cognoscant*) by touch bodies which they have not associated with any color since the day of their birth, you may be sure that bodies not painted about with any hue can be turned into a concept (*notitia*) of our mind.[103]
>
> You may be sure that certain things exist as much deprived of color as without any smell and empty of sound, and that the keen mind can come to know (*cognoscere*) these no less than it can conceive (*notare*) things that are devoid of other qualities.[104]

It is not through sensation, but through "the reason of mind" (*ratio animi*) that we have access to the *primordia*: "eyes cannot recognize the nature of things."[105] The "first bodies" are thus *intelligible*, rather than sensible bodies; we cannot *conceive* of body without size, shape, and

weight, nor, as Leibniz so clearly saw, without a power of resistance or impenetrability.[106] But this mental concept (*menti notitia*) of body is not itself an object of sensation.

It has been suggested that "the fundamental difficulty of the whole Epicurean position" is that it demands, on the one hand, an "absolute trust in the evidence of the senses as the primary criterion of truth," while insisting, on the other hand, that the physical foundation of things consists of imperceptible *primordia*.[107] Although Lucretius draws the sharpest of distinctions between the eternal *primordia* and the transient *things* of our experience, he must nevertheless *bridge* the gap between the two realms, if his project of conversion is to succeed. The government of divine "masters" can only be overthrown,[108] and the atomic foundations of things only secured, if these invisible foundations are made objects of sense experience. In other words, unless the Epicurean doctrine of the atoms is translated into a more visible idiom, it must remain literally obscure, or shrouded in darkness. The corporeality of the *primordia* can be guaranteed only by bringing them "out into the shining borders of light"—to use a Latin idiom Lucretius is fond of. [109] Again and again Lucretius represents his work as an endeavor to make things *visible*. He describes it as an attempt to "illuminate with Latin verses the dark discoveries of the Greeks"[110] and portrays his entire project as one of enabling Memmius to *see* the inner workings of things:

> Your merit and the expected delight of your sweet friendship, […] induces me to stay awake in quiet nights, seeking by what words and what poetry I can at last display before your mind *bright lights,* by which you may be able to *see into* the very depths of hidden things.[111]

One way of spanning the gap between the imperceptible *primordia* and the visible world is through language, especially through various forms of figurative language. It is surely significant that language itself features as a dominant image in *De rerum natura*. Again and

again the poem compares the structure of language to the structure of the world: as variations in the order of letters or sounds give rise to a great variety of words and verses, so too, variations in the "conjunctions, motions, order, position, and shape" of the *primordia* give rise to the even greater variety of *things*. Moreover, the poem makes this analogy between letters and atoms a fundamental feature of its own language: arguing, for example, that Anaxagoras should have seen that wood is not flammable because it contains fire particles, but because both wood—*lignis* (in the ablative plural)—and fire—*ignis*—contain many of the same letters or elements.[112]

Figurative speech is so deeply imbedded in *De rerum natura* that it is not possible to separate philosophical terminology from poetic vocabulary. Consider, for example, the Latin rendering of the Epicurean term ἄτομοι, atoms or, literally, "uncuttables." Lucretius never uses the technical term *ătŏmus*, which his contemporary Cicero does use.[113] Nor does he substitute a *single* Latin term for the Greek word *ἄτομος*.[114] He uses instead a variety of names that present the atoms as generative bodies of *things*. Some of these words are clearly metaphorical in character. Explicitly biological terms such as "seeds of things" and "generative bodies" have a rhetorical function, inviting Memmius to regard the atomic particles as familiar objects of experience, especially when these expressions are used, as they are early in book 1, in the context of agricultural examples.[115] Even language that seems literal, however, terms like *principia*, *corpora prima*, and *prima elementa*, by evoking the notion of a beginning, present eternal entities in terms of a temporal metaphor.[116] The text itself, ever alert to etymologies, reminds us that the predominant term *primordium* refers literally to a "first-rising": "in the earth there are *primordia* of things, which we, when we turn fruitful clods with the plough […],

bring to a rising (*ortus*)."[117] Thus this word too suggests a beginning. Of course, as becomes abundantly clear in Book 3, the "first-bodies" are equally "last bodies," but the vocabulary of *De rerum natura* carefully avoids this association. Furthermore, although the term *corpus* or "body" accurately translates the Greek—and Epicurean—term *σωμα*, we have already seen that the poem's "first bodies" or "generative bodies" are not bodies in the conventional sense; they are not the "mortal bodies" or "visible bodies" of everyday experience, but "eternal" and "invisible" bodies.[118] Finally, the word *materia* or "'matter' in the collective sense,"[119] which may sound more technical to our modern English ears, is deprived of its technical sense by means of a series of puns that serve to remind us that *materia* is derived from *mater* or 'mother.'[120] Here the *metaphorical* reading turns out to be the *literal* reading: etymologically, at least, matter *is* a "mother" of things. Similarly, verbal play draws attention to the fact that *natura* is cognate with the verb *nascor* "to be born," so that a literal reading of the word *natura* produces a metaphor of nature itself as mother.[121]

The *primordia* are presented not only in distinctly temporal and biological terms, but also in distinctly human terms. This personification frequently takes the form of military metaphors: "So, in the balanced strife of the beginnings, war waged from time everlasting is carried on."[122] We may recall here the image of the battling dust motes:

> you will see many minute motes mingling in many ways through the void […] and, as it were, in everlasting strife, struggling, fighting, battling in troops without any pause, driven about with frequent meetings and partings.[123]

Here the heavy-handed alliterative effects Lucretius is so fond of—***m**ultă **m**ĭnūtă **m**ŏdīs **m**ūltīs […] **m**iscēri*—neatly illustrate, both audibly and visibly, how one tiny particle, in this case the letter m, "mingles" with others "in many ways." Moreover, the *primordia* exhibit not only a

"propensity to military action," but also a marked inclination to political life: they join in "councils," "assemblies," "meetings," and "contracts" (*concilia*, *congressūs*, *coetūs*, *nexūs)*; they are governed by "treaties" and "laws" (*foedera* and *leges).*"[124] Once again, it is neither possible, nor particularly helpful, to distinguish clearly between a technical language and a poetic language. Insofar as Lucretius himself repeatedly remarks on what he calls "the poverty of [his] native tongue," he invites his audience to hear the metaphors simply as translations of established Greek philosophical terms. Nonetheless, such frequent, if veiled, personifications of the primordia may gradually persuade Memmius to regard human affairs from a new—and very distant—vantage. From this viewpoint the battles and struggles of great armies are seen to be no more than the contentions of dust motes; the great deliberations and treaties of state no more than temporary and accidental combinations of atoms. The very metaphors that bring the *primordia* directly before our eyes, out of obscurity into the bright light of day, also compel us to "see" the things that formerly occupied our sight and seemed most real as distant and inconsequential. Phenomena formerly perceived as significant—the motions of the sun and stars, great storms, and perhaps even terrible plagues—become insignificant, insofar as they too are little more than the concurrences of dust motes. Things that previously seemed substantial—city walls, gold and silver vessels, our own bodies—are seen, from this new vantage, in all their penetrability: "nothing [nil] exists that is not a texture with porous body."[125]

In many ways the conversion of Memmius seems complete at this point. The *aspect* of nature—its *species*—is radically altered as he focuses his sight on the invisible *primordia* and the things he formerly regarded as substantial recede into a distant haze. A more radical project, however, remains to be effected if "the dominion of gods"[126] is truly to be overthrown

and a more republican—or more human—view of things is to be reinstated. The ignorance of causes,[127] which first induced us to throw ourselves at the feet of tyrannical deities, turns out to be a more radical tyranny than we realized. Our very notion of causality involves a kind of tyranny of the one over the many.

> For which of these causes it is in this world is difficult to determine; but what is possible and may come to be through the whole universe in diverse worlds diversely (*varia ratione*) fashioned, that is what I teach, and I proceed to set forth several causes which may exist for the movements of the stars throughout the whole; one of which, however, must be that which gives force to the movement of the signs in this world too; but which of these it is, is by no means his to lay down who treads forward step by step.[128]

Particularly in the case of phenomena, "whose causes we can by no means see,"[129] there is a danger that not only in the absence of an explanation, but also in the presence of competing accounts, we will "revert again to old religions and adopt harsh masters."[130] Such relapses occur when we are "driven astray by blind reasoning"[131] and are as much a result of a failure to understand the nature of *reason*, as of a failure to perceive the reason of *nature*. In our endeavors to explain natural phenomena we often mistakenly assume that it is sufficient "to indicate a single cause."[132] Lucretius interrupts his explanation of Etna's eruptions and the flooding of the Nile to offer a rather curious illustration of his own etiological principles:

> Just as if you should yourself see some man's body lying lifeless at a distance, you may perhaps think proper to name all the causes of death in order that the one true cause of the man's death may be named. For you could not prove that steel or cold had been the death of him, or disease, or it may be poison, but we know that what has happened to him is something of this sort. Even so in many cases we have the like to say.[133]

If we would truly liberate nature—and ourselves—from the oppressive might of "overweening masters"[134] and recognize nature's capacity for self-governance,[135] we must above all, it is suggested, free ourselves from a misguided attachment to singularity. Habituated as we are to the sight of a single sun, a single moon, one earth, one sky, we mistakenly suppose that such

singleness belongs to the nature of things. This parochial worldview affects—or infects, to borrow Lucretius' own vocabulary of disease—all aspects of human existence. In this we resemble nothing so much as the lover who sighs foolishly for the sole object of his affections, ignoring the fact that "to be sure there are other women; to be sure [he] has lived so far without this one"[136] and failing to recognize that his attachment is merely the effect of habit:

> It is habit that produces love; for that which is frequently struck by a blow, however light, is still vanquished in the long run and totters. Do you not see that even drops of water falling upon a stone in the long run beat a way through the stone?[137]

We have likewise grown attached to simple notions of causality, which blind us not only to the reality of infinite atoms in an infinite void, but also to the ontological consequences of this reality: "nothing is single, nothing born unique and growing unique and alone."[138] In this we may even resemble the inhabitants of the diseased city of Athens, who in their city's "time of trouble" cling so fiercely to what they imagine to be their own, "often brawling with much blood"[139] to secure a funeral pyre for "those of their own blood,"[140] "rather than that the bodies be deserted." Although Memmius may well have lost interest by now, the reader who has attended to the poem's teaching may notice that its last line—*rīxantes pŏtĭus quam corpŏră dēsĕrĕrentur*—conceals yet another play on meaning. The last phrase, which, if we read it in the customary way, means "rather than abandon the bodies," invites the reader to recollect that "bodies are partly the *primordia* of things, partly those which are formed by the union of *primordia*." (1.483) We may also recollect that the primary sense of the verb *dēsĕro* is "untie" or "sever" and notice that it appears here in the passive voice. Thus we may hear, in addition to the more obvious sense of the phrase, something like, "rather than that the *primordia* be severed."[141] We may also hear in the participle *rixantes*, "brawling," its roots in the verb

"ringo"—"bare the teeth" or "snarl," and thus the suggestion that a failure to recognize the inevitable dissolution of all *things* is somehow less than human.

In the battle of the gods and giants, the friends of the *primordia* occupy a curious position.[142] Their assault on Olympus aims to drag all things down to earth: heaven is reduced to a reflection in a puddle, while Jove's thunder—the quintessential symbol of divinity—becomes no more than the flapping of laundry on a clothesline, the fluttering of papers in a breeze, the bursting of a bladder of air. At the same time, however, the friends of the *primordia* suggest that in our attachment to the ground beneath our feet we have in fact lost sight of the nature of material things, supposing that this nature is illuminated by the "rays of the sun and bright shafts of day" rather than by "nature's aspect and reason." They ask that we rethink our understanding of materiality, distinguishing clearly between the phenomena or composite *things* and the principles constitutive of those things. These principles are not, as we have seen, bodily in the conventional sense of the term: the *primordia* will forever elude the hands of the giants, although a poet may persuade them to think that the "first bodies" *are* within easy reach, and so entice them to abandon their fealty to "the rule and kingship of gods."[143] To this extent, perhaps even Memmius may be persuaded to look at the world with new eyes.

---

[1] *On the Nature of Things* (cited hereafter as *DRN*), 1.51. "Memmius" was traditionally identified as Caius Memmius, son of Lucius, who was praetor in 58 BC. This Memmius stood for the consulship in 54 BC, but went into exile in Athens after being prosecuted for bribery. See Cyril Bailey, ed., *Titi Lucreti Cari De Rerum Natura* (Oxford: The Clarendon Press, 1947 [rpt.1998]), 597-8, note on 1.26. In recent years, as a result of questions concerning the traditional dating of *De Rerum Natura* to 54 BC, this identification has been called into question. See G.O. Hutchinson, "The Date of *De Rerum Natura,*" *The Classical Quarterly*, 51.1 (2001), 158-9 and, more recently, Katharina Volk, "Lucretius' Prayer for Peace and the Date of *De Rerum Natura*," *The Classical Quarterly* 60.1 (2010), 127-131.

[2] There has been much speculation about what precisely is meant by the expression, "in our country's time of trouble (*hoc patriai tempore iniquo*)" (1.41). Among the poem's various references to civil bloodshed see, for

example, 3.70: “men amass property by civil bloodshed” (*homines… /sanguine civili rem conflant*). For an allusion to foreign wars of expansion see the image of a Roman fetial hurling his spear over the enemy’s border in declaration of war at 1.968-973. See also Monica Gale, *Virgil on the Nature of Things: the* Georgics, *Lucretius and the Didactic Tradition* (Cambridge: CUP, 2000), 238: “the phrase *patriai tempus iniquum* […] in v.41 presumably refers to the series of civil wars which raged intermittently throughout Lucretius’ lifetime, but no real distinction is drawn between civil and foreign wars.”

[3] E.g., *nam corpora sunt et inane*(1.420); *nil est quod possis dicere ab omni corpore seiunctum secretumque esse ab inani* (1.430-1); *praeter inane et corpora, tertia per se/ nulla potest rerum in numero natura relinqui* (1.445-6). See Polybius, *Histories* 6.56: “But the most important difference for the better which the Roman commonwealth seems to me to display is in their religious beliefs. For it seems to me that what in other nations is looked upon as a reproach, I mean a scrupulous fear of the gods (*την δεισιδαιμονίαν*), is the very thing which keeps the Roman commonwealth together.” Polybius explains that such “invisible terrors” are politically expedient and concludes, “I think, not that the ancients acted rashly and at haphazard in introducing among the people notions concerning the gods and beliefs in the terrors of hell, but that the moderns are most rash and foolish in banishing such beliefs.”

[4] Already at 1.52-53, Lucretius voices a concern that his verses will be “contemptuously discarded before they have been apprehended (*intellecta prius quam sint, contempta relinquas*).” At 2.1041 Lucretius suggests that “frightened by the very novelty” of the Epicurean teachings Memmius may “spew out reason from [his] mind”; at 4. 914 he worries that Memmius may simply “depart with a breast that repels words of truth.” See Katharina Volk, *The Poetics of Latin Didactic: Lucretius, Vergil, Ovid, Manilius* (Oxford: OUP, 2002), 80: “The way in which [Lucretius] presents his student is rather interesting and, perhaps, somewhat surprising… Memmius appears remarkably unsympathetic, unwilling to learn, and even plain stupid. The speaker continually anticipates his addressee’s lagging attention and utterly misguided views.”

[5] *vatum/ terriloquis victus dictis, desciscere quaeres*, 1.102-3

[6]*Hunc igitur terrorem animi tenebrasque necessest/ non radii solis neque lucida tela diei/ discutiant, sed naturae species ratioque.* (1.146-148; 2.59-61; 3.91-3; 6.39-41)

[7] David Sedley, *Lucretius and the Transformation of Greek Wisdom* (Cambridge: CUP, 1998), 37

[8] *cum metus aut dolor est* (5.1061)

[9]= 2.59, 3.91, and 6.39. At 3.16 it appears in the plural (*animi terrores*). 3.152-160 offers an analysis of the physical effects of mental terror: “we often see men fall to the ground for mental terror” (*concidere ex animi terrore videmus/ saepe homines*; 3.157-8)

[10] *nec plangore diem magno solemque per agros/ quaerebant pavidi palantes noctis in umbris* (5.973-5)

[11] *fugiebant saxea tecta/ spumigeri suis adventu validique leonis,/ atque intempesta cedebant nocte paventes/ hospitibus saevis instrata cubilia fronde* (5.984-987)

[12] *volgivago more ferarum* (5.932)

[13] *saetigerisque pares subus silvestria membra/ nuda dabant terrae nocturne tempore capti,/ circum se foliis ac frondibus involventes.* (5.970-2)

[14] *Nam cum suspicimus magni caelestia mundi/ templa super stellisque micantibus aethera fixum,/ tunc aliis oppressa malis in pectora cura/ illa quoque expergefactum caput erigere infit*…(5.1204-1208) Or: “that care, as yet bent down (*oppressa* fem. sing. modifying *cura* rather than neut.pl. modifying *pectora*) by other evils”

[15] See Bailey, p.1517, note on ll.1207-8: “a strange picture, but not impossible, if the imagery is not pressed too literally.” It seems, however, that the image becomes revealing precisely when pressed literally. For more general studies of the uses of personification in *DRN* see Myrto Garani, *Empedocles redivivus: Poetry and Analogy in Lucretius* (London and New York: Routledge, 2007, chapter 1, and Monica Gale, *Myth and Poetry in Lucretius* (Cambridge: Cambridge University Press, 1994), pp.39-45 and 122f.

[16] Both the participle *expergefactum*—"wakened"—and the verb *erigere*—"raise" or "straighten out"—share the root *rego*--from Greek *ορεγω* = "reach"—which has as its basic meaning the notion of making (or keeping) something straight. (*erigo, erexi, erectum = ex+rego*; *expergo = ex+pergo*, and *pergo, perrexi, perrectum = per+rego*; see Lewis and Short)

[17] *caelumque videre/ iussit et erectos ad sidera tollere vultus*: see Ovid, *Metamorphoses*, 1.84-88: "he granted man a raised face and commanded him to look at the sky and to raise erected faces to the stars." Ovid's account is in turn echoed by Milton in *Paradise Lost*, 4.288-90: "Two of far nobler shape erect and tall,/ Godlike erect, with native honor clad/ In naked majesty seemed lords of all."

[18] *Praeterea caeli rationes ordine certo/ et varia annorum cernebant tempora verti,/* ***nec poterant quibus id fieret cognoscere causis.*** (5.1183-5)

[19] E.g. 1.62; 1.342; 1.998; 2.732; 3.185; 3.995. See Bailey, p.608, note on 1.62.

[20] *Quippe ita formido mortalis continent omnis,/* ***quod multa in terris fieri caeloque tuentur/ quorum operum causas nulla ratione*** videre/ ***possunt,*** *ac fieri divino numine rentur.* (1.151-154) Lewis and Short: *formido* is from the same Sanskrit root (*dhar*-) as the word *firmus* and means "properly the fear that makes rigid." Lewis and Short claims the word also has the sense "awe, reverence" and refers to Virgil's famous description of "the twin gates of war": "There are twin gates of war (so they are named), sanctified by religion and by the dread of fierce Mars" (*Sunt geminae belli portae (sic nomine dicunt)/ religione sacrae et saevi formidine Martis; Aeneid*, 7.607-8

[21] "and they placed the gods' habitation and abode in the sky, because through the sky the night and the moon are seen to revolve, moon, day, and night and the solemn stars of night, heaven's night-wandering torches and flying flames, clouds, sun, rains, snow, winds, lightnings, hail, and rapid roarings and mighty menacing rumblings." *in caeloque deum sedes et templa locarunt,/ per caelum volvi quia nox et luna videtur,/ luna dies et nox et noctis signa severa/ noctivagaeque faces caeli flammaeque volantes,/ nubile sol imbres nix venti fulmina grando/ et rapidi fremitus et murmura magna minarum.* (5.1188-93)

[22] *ergo perfugium sibi habebant omnia divis/ tradere et illorum nutu facere omnia flecti*. (5.1186-7)

[23] *O genus infelix humanum, talia divis/ cum tribuit facta atque iras adiunxit acerbas!* (5.1194-5)

[24] *cui non animus formidine divum/ contrahitur, cui non correpunt membra pavore,/ fulminis horribili cum plaga torrida tellus/ contremit…? denique sub pedibus tellus cum tota vacillat/ concussaeque cadunt urbes dubiaeque minantur/ quid mirum si se temnunt mortalia saecla/ atque potestates magnas mirasque relinquunt/ in rebus viris divum, quae cuncta gubernent?* (5.1218-1221 and 1236-1240)

[25] The primary meaning of the verb *paveo* is "to be struck with fear or terror, to tremble or quake with fear." (Lewis and Short)

[26] *incesserat* (6.1212)

[27] *mortis mĕtŭs … ācer* (6.1212)

[28] *metus ille … Acheruntis…,/ funditus humanam qui vitam turbat ab imo/ omnia suffundens mortis nigrore neque ullam/ esse voluptatem liquidam puramque relinquit*. (3.37-40) Lewis and Short suggest that *metus*, at least in its verbal form *metuo*, refers especially to fear "as the effect of the *idea* of threatening evil (whereas *timor* usually denotes the effect of some *external cause* of terror) [my italics]." On Lucretius' use of *metus* see Monica Gale, *Virgil on the Nature of Things: the* Georgics*, Lucretius, and the Didactic Tradition* (Cambridge: Cambridge University Press, 2000), chapter 5: "*Labor improbus*." It should be remembered, however, that on one occasion, Lucretius uses the word *metus* to refer to the fear an animal experiences—see note viii above.

[29] "Ennius sets forth in the discourse of his immortal verse that there is besides a realm of Acheron, where neither our souls nor bodies endure, but as it were images pale in wondrous wise (*etsi praeterea tamen esse Acherusia templa/ Ennius aeternis exponit versibus edens,/ quo neque permaneant animae neque corpora nostra,/ sed quaedam simulacra modis pallentia miris*)" (1.120-123)

[30] It is worth noting that fear (*metus)*—along with care and toil—is one of the "demonic personifications which haunt the entrance to the underworld" in Book 6 of Virgil's *Aeneid*. Monica Gale, *Virgil on the Nature of Things*, 146

[31] *Quippe etenim mortale aeterno iungere et una/ consentire putare et fungi mutual posse/ desiperest; quid enim diversius esse putandumst/ aut magis inter se disiunctum discrepitansque,/ quam mortale quod est inmortali atque perenni/ iunctum in concilio saevas tolerare procellas?* (3.800-805)See Bailey, 1128, note on 3.803: "mortal and immortal in a *concilium* could not harmonize or really form one thing."

[32] *omnis enim per se divom natura necessest/ inmortali aevo summa cum pace fruatur/ semota ab nostris rebus seiunctaque longe*; 1.44-6 = 2.646-8)

[33] *finita potestas denique cuique/ quanam sit ratione atque alte terminus haerens* (1.76-7). The lines are repeated at 1.595-6, 5.89-90, and 6.65-66. Cp. also 2.1087: "there is a deepset limit of life equally awaiting them ['sky, earth, sun, moon, sea and all else that exists'] (*vitae depactus terminus alte tam manet haec*)."

[34] *vertier ad lapidem atque omnis accedere ad aras* (5.1199)

[35] *procumbere humi prostratum* (5.1200) See Bailey, p.1516, note on 5.1200: "the attitude of worship in prostration after prayer."

[36] *Humana ante oculos foede cum vita iaceret/ in terris oppressa gravi sub religione,/ quae caput a caeli regionibus ostendebat/ horribili super aspectu mortalibus instans* (1.62-5)

[37] Nor is the sky inhabited by gods alone: when dark thunderclouds mass overhead, humans imagine that all the shades of the infernal caverns loom above them, turning horrific faces toward the living, "to such a degree […] does the *face* of black terror hang over us." (*usque adeo taetra nimborum nocte coorta/ inpendent atrae formidinis ora superne*; 6.253-4)

[38] *nubila despicere et caelum ut videare* (4.418)

[39] *Ita haec species miranda fuisset./ quam tibi iam nemo, fessus satiate videndi,/ suspicere in caeli dignatur lucida templa!* (2.1037-1039)

[40] Reading *anxia cordi* (6.14). The emendation *anxia corda* has the same sense.

[41] *quaerere semper/ commutare locum, quasi onus deponere possit* (3. 1058-9)

[42] *tanta mali tamquam moles in pectore constet* (3.1056) See also 3.1054: "there is a weight on their minds which wearies with its oppression" (*pondus inesse animo quod se gravitate fatiget*)

[43] Two of far nobler shape erect and tall,/ Godlike erect, with native Honour clad/ In naked Majestie seemd Lords of all (Milton, *Paradise Lost*, 4.288-90)

[44] *Nec pietas ullast velatum saepe videri/ vertier ad lapidem atque omnis accedere ad aras,/ nec procumbere humi prostratum et pandere palmas/ ante deum delubra, nec aras sanguine multo/(spargere quadrupedum, nec votis nectere vota,/ sed mage placata posse omnia mente tueri.* (5. 1198-1203)

[45] *…morbi quia causam non tenet aeger;/ quam bene si videat, iam rebus quisque relictis/ naturam primum studeat cognoscere rerum* (3.1070-72) Or, in the words of Virgil's famous homage to Lucretius, "Happy is he who was able to know the causes of things, and cast all fears and inexorable fate under his feet, and the roaring of greedy Acheron."(*felix, qui potuit rerum cognoscere causas,/ atque metus omnis et inexorabile fatum/subiecit pedibus strepitumque Acherontis avari."* Virgil,*Georgics* 2.490-492) Virgil is here echoing Lucretius' own eulogy of Epicurus, on account of whose philosophical heroism and "virtue of mind" (*animi virtutem*; 2.70), "religion in turn is cast down under [our] feet and trampled, and we by the victory are made level with heaven." (*quare religio pedibus subiecta vicissim/ obteritur, nos exaequat victoria caelo*; 1.78-9)

[46] See Robert Wardy, "Lucretius on What Atoms Are Not," *Classical Philology*, 83.2 (1988), 112-128

[47] Pierre-Marie Morel, "Epicurean Atomism," in *The Cambridge Companion to Epicureanism* (Cambridge: CUP, 2009), 65-83, claims that the wish "to ensure the cohesion of composite bodies and, in this way, [to] retain the phenomena" represents a fundamental difference between Epicurean atomism and early Greek atomism.

[48] *nec manet ulla sui similis res: omnia migrant, omnia commutat natura et vertere cogit* (5.830-1) See also 5.828-835: "For time changes the nature of the whole world and one state of things must pass into another, and nothing remains as it was: all things move, all are changed by nature and compelled to alter. For one thing crumbles and grow faint and weak with age; another grows up and comes forth from contempt. So therefore time changes the nature of the whole world, and one state of the earth gives place to another,…"

[49] *usque adeo omnibus ab rebus res quaeque fluenter/ fertur […]/ nec mora nec requies interdatur ulla fluendi,/ perpetuo quoniam sentimus,* […] (4.225-228)

[50] *aliquid supereare necesse est incolumne ollis* (1.672)

[51] *omnia constant/ usque adeo variae volucres ut in ordine cunctae/ ostendant maculas generalis corpore inesse* (1.588-590)

[52] *res nulla sit una,/ […]/ quin aliquoiu siet saecli permultaque eodem/ sint genere*. (2. 1077-80)

[53] The two species are mentioned in connection with the phenomenon of iridescence in 2.799-809.

[54] 1.586. The phrase occurs a number of times; see, for example, 2.302; 5.310; 5.924; 6.906.

[55] See Alessandro Schiesaro, "Lucretius and Roman Politics and History," in *The Cambridge Companion to Lucretius*, 48: "Lucretius' laws of nature do not exist outside and above the physicality of atoms, do not answer an inscrutable teleological project and have not been promoted by a provident lawgiver."

[56] *inmutabili' materiae quoque corpus habere/ debent nimirum* (1.591-2) Newton, a careful reader of Lucretius, summarizes this argument at the end of the second edition of the *Optics*: "While the Particles continue entire, they may compose Bodies of one and the same Nature and Texture in all Ages; But should they wear away or break in pieces, the Nature of Things depending on them would be changed." *Optics* (1718), query 31. The connection is noted by Bailey, 698 and by Monte Johnson and Catherine Wilson, "Lucretius and the History of Science," in *The Cambridge Companion to Lucretius*, 140-141.

[57] *Corpora sunt porro partim primordia rerum,/ partim concilio quae constant principiorum*. (1.483) See Epicurus, Letter to Herodotus, 40-41: "And truly, of bodies some are compounds (*συνκρίσεις*), and others those of which compounds are made (*πεποιήται*)."

[58] See Bailey, note on 1.21 (p.596): "*res* in Lucr. are strictly speaking compound things, made of the mixture of atoms and void."

[59] *Nil esse, in promptu quorum natura videtur,/ quod genere ex uno consistat principiorum,/ nec quicquam quod non permixto semine constet*. (2.583-5) Lucretius clearly lays considerable weight on this teaching; he prefaces it by cautioning Memmius to "guard it sealed and treasured in the mind's memory" (*obsignatum […] habere/ […] et memori mandatum mente tenere*; 2.581-2)

[60] See for example, *Metaphysics* 1050a15: "matter exists in a potential state." As pure potentiality, matter itself is never an object of knowledge: "matter is unknowable in itself" (*Metaphysics* 1036a9). In book one of the Physics, Aristotle allows, however, that matter can be an object of knowledge by way of analogy: "For as the bronze is to the statue, the wood to the bed, or the matter and the formless before receiving form to anything which has form, so is the underlying nature to substance, i.e. the 'this' or existent." (*Physics* 191a8-12)

[61] "therefore the primordia exist by a solid singleness" *(sunt igitur solida primordia simplicitate*; 1.609); "strong rather by their eternal singleness" (*magis aeterna pollentia simplicitate*: 1.612). At 2.87 Lucretius also claims that the primordia are "perfectly hard" (*durissima*).

[62] "We must keep all our investigations in accord with our sensations" (έτι τε κατα τας αισθησεις δει πάντα τηρειν; Epicurus, *Letter to Herodotus*, 38); "in accordance with the evidence of sense we must of necessity judge of the

imperceptible by reasoning" (*καθ' ην αναγκαιον το άδηλον τωι λογισμωι τεκμαίρεσθαι*; *Letter to Herodotus*, 39)

[63] *[…]nisi prima fides fundata valebit,/ haud erit occultis de rebus quo referentes/ confirmare animi quicquam ratione queamus* (1.423-5) see also 4. 478-79: "You will find that it is from the senses in the first instance that the concept of truth has come, and that the senses cannot be refuted." (*invenies primis ab sensibus esse creatam/ notitiem veri neque sensus posse refelli.*)

[64] *corpus enim per se communis dedicat esse/ sensus* (1.422-3) Epicurus, *Letter to Herodotus*, 39: "for that bodies exist, sensation itself, common to all, bears witness (*σωματα μεν γαρ ως εστιν, αυτη η αισθσις επι παντων μαρτυρει)* In the context of the passage, as well as in light of Lucretius' general usage of *per se* to mean "self-subsistent," it seems better to take *per se* with *corpus* than with *sensus*. Cp. also Aristotle, *Physics* I.2, 185a12: "We physicists, on the other hand, must take for granted that the things that exist by nature are, either all or some of them, in motion—which is indeed made plain by induction."

[65] *quo referemus enim? Quid nobis certius ipsis/ sensibus esse potest, qui vera ac falsa notemus?* (1. 699-700)

[66] See for example 4.478-481: "You will find that it is from the senses in the first instance that the concept of truth has come, and that the senses cannot be refuted. For some standard must be found of greater credit (*maiore fide*), which can of itself (*sponte sua*) refute false things by true. What, moreover, must be held to be of greater credit (*maiore fide*) than the senses?"

[67] *non modo enim ratio ruat omnis, vita quoque ipsa/ concidat extemplo, nisis credere sensibus ausis* (4.507-508)

[68] *neqeunt oculis rerum primordia cerni,/ accipe praeterea quae corpora tute necessest/ confiteare esse in rebus nec posse videri*. (1.269-270)

[69] *primordia tantum/ sunt infra nostros sensus tantoque minora/ quam quae primum oculi coeptant non posse tueri* (4.111-113) See also 2.312-3: "all the nature of first-bodies lies far from our senses, below them (*omnis enim longe nostris ab sensibus infra/ primorum natura iacet*). In yet another passage Lucretius refers to the *primordium* as "that body which our senses are no longer able to perceive." (*corp[us] ill[ud] quod nostri cernere sensus/ iam nequeunt*; 1.600)

[70] *at primordia gignundis in rebus oportet/ naturam clandestinam caecamque adhibere,/ emineat nequid quod contra pugnet et obstet/ quominus esse queat proprie quodcumque creatur*(1.778-81). For the same phrase and argument applied specifically to the question whether the primordia have color, see 2.794, quoted below.

[71] *sin ita forte putas ignis terraeque coire/ corpus et aerias auras roremque liquoris,/ nil in concilio naturam ut mutet eorum,/ nulla tibi ex illis poterit res esse creata,/ non animans, non exanimo cum corpore, ut arbos;/ quippe suam quidque in coetu variantis acervi/ naturam ostendet mixtusque videbitur aer/ cum terra simul atque ardor cum rore manere* (1.770-777). At 2.920, Lucretius employs the same logic to make his case that sentient beings must be composed of non-sentient atoms: "it cannot be that parts have independent sensation […] supposing they did, yet by combination and union they will produce nothing but *a throng and crowd* (*vulgum turbamque*) of living things, exactly as men, cattle, and wild beasts could not produce anything (*ullam rem*) amongst themselves by coming together." (2.910 and 920-923)

[72] *Nunc age dicta meo dulci quaesita labore/ percipe, ne forte haec albis ex alba rearis/ principiis esse, ante oculos quae candida cernis,/ aut ea quae nigrant nigro de semine nata;/ nive alium quemvis quae sunt imbuta colorem,/ propterea gerere hunc credas, quod materiae/ corpora consimili sint eius tincta colore./ nullus enim color est omnino materiai/ corporibus, neque par rebus neque denique dispar*.(2.730-738) At 2.755-6 Lucretius again cautions Memmius directly on this point: "Take care not to steep in color the seeds of things, lest for you all things altogether pass away to nought (*colore cave contingas semina rerum/ ne tibi res redeant ad nilum funditus omnes*)."

[73] There has been considerable debate about Lucretius' relation to Empedocles, and especially about is meant by the *praeclara reperta* attributed to Empedocles at *DRN* 1.736. See, for example, David Sedley, "Lucretius and the New Empedocles," *Leeds International Classical Studies* 2.4 (2003), 1-12: "In Book 1, Lucretius criticizes Empedocles' theory of the four elements, but in the same breath concedes that Empedocles did make some great

discoveries (*praeclara reperta*, 1.736). An important question to pursue is: what discoveries? I remain resistant to one particular proposal, that the Empedoclean features in Lucretius' proem signal his recognition of Empedocles as a major philosophical forerunner. In response, I have argued that the debt acknowledged here is a literary one, to the founder of his genre, and that Lucretius would not want to allow Empedocles much credit on the two central philosophical issues that have been suggested as common ground: the need to posit enduring elements, and the denial of natural teleology." (p.2) The opposite view is articulated very clearly by David Furley: "Lucretius had every reason to pay tribute to Empedocles as the inventor of elements, even though he could not accept the Empedoclean theory in detail." David Furley, *Cosmic Problems: Essays on Greek and Roman Philosophy of Nature*, (Cambridge: CUP, 1989), 178.

[74] *ossa videlicet e pauxillis atque minutis/ ossibus hic et de pauxillis atque minutis/ visceribus viscus gigni sanguenque creari/ sanguinis inter se multis coeuntibu' guttis/ ex aurique putat micis consistere posse/ aurum et de terris terram concrescere parvis,/ ignibus ex ignis, umorem umoribus esse, cetera consimili fingit ratione putatque*.(1.835-842) At 1.915-920, Lucretius resorts to ridicule: "Lastly, if you think that whatever you see amongst visible things cannot be brought about without imagining (*fingas*) that the elements of matter are endowed with a like nature, on this reasoning there is an end of your first-beginnings of things: it will follow that they guffaw shaken with quivering laughter, and bedew face and cheeks with salt tears."

[75] *adde quod inbecilla nimis primordia fingit,/ si primordia sunt, simili quae praedita constant/ natura atque ipsae res sunt, aequeque laborant/ et pereunt* (1.847-850)

[76] *debent primordia rerum/ non adhibere suum gignundis rebus odorem/ nec sonitum, quoniam nil ab se mittere possunt,/ nec simili ratione saporem denique quemquam/ nec frigus neque item calidum tepidumque vaporem,/ cetera; quae […] omnia sint a principiis seiuncta necessest,/ inmortalia si volumus subiungere rebus/fundamenta quibus nitatur summa salutis* (2. 854-863). Among the objections to the Epicurean account that are voiced in Cicero's *De natura deorum*, is an objection to the Epicurean claim that "out of particles of matter not endowed with heat, nor with any 'quality' (that which the Greeks call *ποιότητα*)…the world has emerged complete…" (Cicero, *De natura deorum*, 2.37)

[77] *coniunctum est id quod nusquam sine permitiali/ discidio potis est seiungi seque gregari,/ pondus uti saxis, calor igni, liquor aquai,/ tactus corporibus cunctis, intactus inani* (1.451-454). On the illustrative role of the tmesis in the phrase *seque gregari*, see Stephen Hinds, "Language at the Breaking Point: Lucretius 1.452," *The Classical Quarterly*, 37.2 (1987), 451: ""If *segregari* suffers the threatened loss of its conjoined *se*, it will become a mutilated, senseless fragment. *segregari*, *aggregari* and *congregari* all mean something; but as a simple verb *gregari* is utterly without existence in the lexicon of republican Latin." At 1.334, void is in fact distinguished from body precisely as the intangible from the tangible: "Therefore there is intangible space, void, emptiness (*quapropter locus est intactus inane vacansque*)."

[78] *tactus enim , tactus, pro divum numina sancta,/ corporis est sensus* (2.434-5)

[79] Lucretius refers to the primordia as "generative bodies" (*genitalia corpora*; e.g. 1.58), "first bodies" (*corpora prima* (e.g. 1.61) and "bodies of matter" (*materiae corpora*, e.g. 2.142f.).

[80] "You may safely say that the first-beginnings of spirit lie at such intervals apart as equal the smallest things which falling upon us are able to awaken sense-bringing motions in our body." *dumtaxat ut hoc promittere possis,/ quantula prima queant nobis iniecta ciere/ corpora sensiferos motus in corpore, tanta intervalla tenere exordia prima animai*. (3.377-380)

[81] *…quae corpora mittere possit/ sensibus et nostros adiectu tangere tactus*.(1.684-689)

[82] *sed ne forte putes solo spoliata colore/ corpora prima manere, etiam secreta teporis/ sunt ac frigoris omnino calidique vaporis,/ et sonitu sterila et suco ieiuna feruntur, nec iaciunt ullum proprium de corpore odorem*. (2.842-846)

[83] *ἀδύνατον γὰρ οὐσίαν ἐξ οὐσιῶν εἶναι ἐνυπαρχουσῶν ὡς ἐντελεχείᾳ: τὰ γὰρ δύο [5] οὕτως ἐντελεχείᾳ οὐδέποτε ἓν ἐντελεχείᾳ* (*Metaphysics*, 1039a2-5)

[84] See Morel, "Epicurean atomism," 75: "The existence of movement is an axiom in the whole atomist tradition: the reality of motion is an immediate given."

[85] *prima moventur enim per se primordia rerum* (2.133)

[86] Or: "equally moved." *Omnia quapropter debent per inane quietum/ aeque ponderibus non aequis concita ferri*. (2.238-9)

[87] "like drops of rain" *imbris uti guttae* (2.222)

[88] *reminiscere totius imum/ nil esse in summa, neque habere ubi corpora prima/consistant, quoniam spatium sine fine modoquest* (2.90-92)

[89] *ita nil umquam natura creasset*; 2.224)

[90] *natura gerat res* (2.242)

[91] *corpora cum deorsum rectum per inane feruntur/ ponderibus propriis, incerto tempore ferme/ incertisque locis spatio depellere paulum,/ tantum quod momen mutatum dicere possis.* (2.217-220)

[92] On the notion of *l'esprit de finesse*, see Pascal, *Pensées*, trans. A.J.Krailsheimer (Penguin Books, 1966), 211, #512: "The thing must be seen all at once, at a glance, and not as a result of progressive reasoning, at least up to a point." It is worth noting that Pascal does regard *l'esprit de finesse* as a *rational* faculty; he refers, for example, to "this kind of reasoning." See also Nicholas Hammond, *The Cambridge Companion to Pascal* (Cambridge: CUP, 2003), 246: "He goes to great lengths to distinguish between these two 'minds,' both of which are related to reasoning, but in very different ways."

[93] *namque hoc in promptu manifestumque esse videmus,/ pondera, quantum in sest, non posse oblique meare* (2.246-7)

[94] *certamine proelia pugnas/ edere turmatim certantia nec dare pausam,/ conciliis et discidiis exercita crebris* (2.116-120)

[95] *animum te advertere* (2.125)

[96] *conicere ut possis ex hoc, primordia rerum/ quale sit in magno iactari semper inani* (2.121-2)
[97] E.g., 2.1061; 2.1073-4

[98] *Nec tamen omnimodis conecti posse putandum est/ omnia; nam volgo fieri portent videres,/ […]/quorum nil fiere manifestum est, omnia quando/ seminibus certis certa genetrice creata/ conservare genus crescentia posse videmus./ scilicet id certa fieri ratione necessust*. (2.700-710)

[99] *materiai/ concursus motus ordo positura figurae cum permutantur, mutari res quoque debent* (2.1019-1022) See also 1.685-687: "there are certain bodies which by their *concurrences, motions, order, positions, shapes*, produce fire, and which when their *order* is changed, change the nature of the thing" and 2.725-727: "Since the seeds are different, different must be their *intervals, passages, connections, weights, blows, meetings, motions*…"

[100] *sed ne forte putes animalia sola teneri/ legibus hisce, eadem ratio disterminat omnia*.(2.718-9) Lucretius uses both the terms *lex* and *foedus* in reference to nature's laws. See Bailey, 699, note on 1.586: "it must be remembered that the meaning is different from that of the modern expression. Lucretius is not thinking of an observed uniformity in nature, but rather of the limits which nature imposes on the growth, life, powers, etc., of things."

[101] *officium quod corporis exstat,/ officere atque obstare* (1.336-7)
[102] On the notion of the *cacumen*, see 1.599-614.

[103] *in quae corpora si nullus tibi forte videtur/ posse animi iniectus fieri, procul avius erras./ nam cum caecigeni, solis qui lumina numquam/ dispexere, tamen cognoscant corpora tactu/ ex ineunte aevo nullo coniuncta colore,/ scire licet nostrae quoque menti corpora posse/ vorti in notitiam nullo circumlita fuco*. (2.739-745)

[104] *scire licet quaedam tam constare orba colore/ quam sine odore ullo quaedam sonituque remota,/ nec minus haec animum cognoscere posse sagacem/ quam quae sunt aliis rebus private notare.* (2.837-841)

[105] *hoc animi demum ratio discernere debet,/ nec possunt oculi naturam noscere rerum*; 4.384-5)

[106] See Leibniz' essay "On Body and Force, Against the Cartesians," *Philosophical Essays*, trans. Roger Ariew and Daniel Garber (Indianapolis: Hackett, 1989), 250: "against Descartes, I think that there is something passive in body over and above extension, namely, that by which body resists penetration." For the phrases *animi ratio* and *mentis ratio* see for example 1.425, 1.448, 2.381, 2.677, and 4. 384.

[107] Bailey, 644 (introduction to 1.265-328)

[108] At 2.1091, the gods are referred to as *domini superbi* and at 6.63 as *domini acres.*

[109] 1.22-3: "without you nothing comes forth into the shining borders of light" (*nec sine te quicquam dias in luminis oras/ exoritur*). Bailey, 597, note on 1.22, points out that the phrase *luminis oras* was already used by Ennius, but is clearly a favorite with Lucretius, who uses it nine times, and probably understands it literally, "*luminis oras* being the borderline between the light of life and previous darkness." See also 1.179: "the lively earth safely brings out things young and tender into the borders of light For a more general discussion of Lucretius' employment of images of light (and dark) see D. West, *The Imagery and Poetry of Lucretius* (Edinburgh: Edinburgh University Press, 1969), chapter 7, "Light and Fire and Fluidity of Imagery," 79-93.

[110] *Graiorum obscura reperta/[…] inlustrare Latinis versibus* (1.136-7)

[111] *sed tua me virtus tamen et sperata voluptas/ suavis amicitiae quemvis efferre laborem / suadet, et inducit noctes vigilare serenas/ quaerentem dictis quibus et quo carmine demum/ clara tuae possim praepandere lumina menti,/ res quibus occultas penitus convisere possis.res quibus occultas penitus convisere possis*. (1.140-145) See also the closing lines of book 1: "nor will blind night rob snatch the path away from you and prevent you from seeing through to the ultimate [recesses] of nature: thus things will kindle lights for things" (*nec tibi caeca/ nox iter eripiet quin ultima naturai/ pervideas: ita res accendent lumina rebus*; 1.1115-1117).

[112] Lucretius makes use of the fact that the Latin noun *elementa* refers both to letters and to physical elements.

[113] See especially *De natura deorum*, 1.24 (65): "you make great play with the lawless dominion of the atoms" (*abuteris ad omnia atomorum regno et licentia*)

[114] See Bailey, 606, note on 1.55: "*primordia* is Lucr.'s favourite word for the 'atoms', … it occurs 72 times in the poem… *principia* corresponds to Epicurus' *αρχαί*; *primordia* does not exactly represent any word in Epicurus' terminology, and conversely his technical term *ἄτομοι* is not reproduced by Lucretius."

[115] *semina rerum* (e.g., 1.59); *genitalia corpora* (e.g., 1.58). P.H. Schrijvers, "Seeing the Invisible: a Study of Lucretius' Use of Analogy in *De rerum natura*," in *Oxford Readings in Classical Studies*, 258, proposes that the term "first bodies" (*corpora prima*) ranks among "the neutral or semi-technical terms […] belonging to the domain of the *illustrandum*," whereas terms such as "generative bodies" (*genitalia corpora*) and "seeds of things" (*semina rerum*) "are derived instead from the specific field of biology" and function as analogies. On the other hand Duncan Kennedy, "Making a Text of the Universe," in *Oxford Readings*, 386, suggests that the very use of the term *corpus* in this context is already metaphorical: it "pictures them in anthropomorphic terms (they are 'bodies', *corpora*)."

[116] *principia* (e.g., 1.198); *corpora prima* (e.g., 1.61); *prima elementa* (e.g., 6.1009). Kennedy, 386, points out that even the apparently neutral phrase *rerum primordia* has rhetorical implications: it "emphasizes the notion of beginning," whereas the "atoms individually are eternal."

[117] *esse videlicet in terris primordia rerum/ quae nos, fecundas vertentes vomere glebas […], cimus ad ortus* (1.210-212

[118] *mortalia corpora* (1.232); *aperta corpora* (1.297); *aeterna corpora* (1.242); *corpora caeca* (1.277)

[119] Bailey, 607.

[120] E.g., 1.168 and 171

[121] E.g., 1.112-3: *ignoratur enim quae sit natura animai,/ nata sit an contra nascentibus insinuetur* ("for there is ignorance what is the nature of soul, whether it be born or on the contrary inserted into those being born")

[122] *sic aequo geritur certamine principiorum/ ex infinito contractum tempore bellum*. (2. 573)

[123] *multa minuta modis multis per inane videbis/ […]/ et velut aeterno certamine proelia pugnas/ edere turmatim certantia nec dare pausam,/ conciliis et discidiis exercita crebris* (2.116-120)

[124] Monica Gale, *Myth and Poetry in Lucretius*, 123

[125] *nil est nisi raro corpore nexum* (6. 958). See also the beginning of this paragraph: "Now I will recollect once more of how porous a body all things are." (*nunc omnis repetam quam raro corpore sint res/ commemorare*; 6.936-7)

[126] *deorum … imperium* (6.54-5). See note 126 below.

[127] *ignorantia causarum* (6.54)

[128] *nam quid in hoc mundo sit eorum ponere certum/ difficile est; sed quid possit fiatque per omne/ in variis mundis varia ratione creatis,/ id doceo, plurisque sequor disponere causas/ motibus astrorum quae possint esse per omne;/ e quibus una tamen siet hic quoque causa necessest/ quae vegeat motum signis; sed quae sit earum/ praecipere haudquaquamst pedetemptim progredientis*. (5.526-533) Cp. Epicurus, "Letter to Herodotus," §§79-80; "Letter to Pythocles," §§85-88. See Bailey, 1398: "Lucretius makes the important addition, to which he frequently recurs, that if any one of the supposed causes does not hold good in our world, yet it will in some other world."

[129] *quorum […] causas nulla ratione videre* (1.153-4 is repeated both at 6.56-57 and at 6.90-91.)

[130] *rursus in antiquas referuntur religiones,/ et dominos acris adsciscunt* (5.86-87 and again at 6. 62-63)

[131] *errantes caeca ratione* (6.67)

[132] *ūnam dīcere causam* (6.704)

[133] *corpus ut exanimum siquod procul ipse iacere/ conspicias hominis, fit ut omnis dicere causas/ conveniat leti, dicatur ut illius una;/ nam neque eum ferro nec frigore vincere possis/ interiisse neque a morbo neque forte veneno,/ verum aliquid genere esse ex hoc quod contigit ei/ scimus*. *item in multis hoc rebus dicere habemus*.(6. 705-711)

[134] *dominis…superbis* (2.1091)

[135] *ipsă suā per se sponte omnia dis agere expers* (2. 1092)

[136] *nempe aliae quoque sunt; nempe hac sine viximus ante* (4.1173)

[137] *consuetudo concinnat amorem;/ nam leviter quamvis quod crebro tunditur ictu,/ vincitur in longo spatio tamen atque labascit./ nonne vides etiam guttas in saxa cadentis/ umoris longo in spatio pertundere saxa?* (4.1283-1287)

[138] 2.1077-78. Note the growing rhetoric of singularity in these lines: "*una, unica…unica solaque*" Cp. also 2. 1053-1060: "Now since there is illimitable space empty in every direction, and since seeds innumerable in number in the unfathomable universe are flying about in many ways driven in everlasting movement, it cannot by any means be thought likely that this is the only round earth and sky that has been made…especially since this world was made by nature, and the seeds of things themselves of their own accord, knocking together by chance, clashed in all sorts of ways, darkly, aimlessly, without intention…"

[139] *multo cum sanguine saepe/ rixantes* (6.1285-6)

[140] *suos consanguineous* (6.1283)

[141] I wish to thank my colleague Brendon Lasell for pointing out the possible verbal play on *corpora*.

[142] The Gigantomachy is referred to at 5.110-25 as well as at 4.136-42. Although Epicurus is associated with the Giants (the clause "those who with their reasoning [*ratione sua*] shake the walls of the world," 5.119 echoes the

encomium of Epicurus at 1.73), it is important to note that this identification is said to occur in the minds of those who "bitted and bridled by superstition […] think that earth and sun and sky, sea, stars, and moon are of divine body." (5.114-6) *Such* individuals can see only a crass materialism in the doctrine of the *primordia*. I have tried to show, however, that it is an oversimplification to suppose, as Monica Gale does, that Lucretius subscribes to a simple division between Epicurean materialism and Platonic idealism. See Gale, *Myth and Poetry in Lucretius*, 44, note 162: "the Epicureans would be on the side of the materialist 'Giants' against the 'friends of the Forms.'"

[143] *deorum […] imperium […] regnum*(6.54-55)