

# Monism: The Priority of the Whole

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Listening not to me but to the Logos it is wise to agree that all things  
are one.

—Heraclitus

Consider a circle and a pair of its semicircles. Which is prior, the whole or its parts? Are the semicircles dependent abstractions from their whole, or is the circle a derivative construction from its parts? Now in place of the circle consider the entire cosmos (the ultimate concrete whole), and in place of the pair of semicircles consider the myriad particles (the ultimate concrete parts). Which if either is ultimately prior, the one ultimate whole or its many ultimate parts?

The *monist* holds that the whole is prior to its parts, and thus views the cosmos as fundamental, with metaphysical explanation dangling downward from the One. The *pluralist* holds that the parts are prior to their whole, and thus tends to consider particles fundamental, with

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metaphysical explanation snaking upward from the many. Just as the materialist and idealist debate which properties are fundamental, so the monist and pluralist debate which objects are fundamental.

I will defend the monistic view. In particular I will argue that there are physical and modal considerations that favor the priority of the whole. Physically, there is good evidence that the cosmos forms an *entangled system* and good reason to treat entangled systems as irreducible wholes. Modally, mereology allows for the possibility of *atomless gunk*, with no ultimate parts for the pluralist to invoke as the ground of being.

The debate between monists and pluralists has long occupied philosophical center stage, with William James (1975, 64) considering it “the most central of all philosophic problems, central because so pregnant.” The monistic side can claim an intellectual pedigree tracing from Parmenides, Plato, and Plotinus, to Spinoza, Hegel, and Bradley. During the nineteenth century, the monistic side had achieved a position of dominance.<sup>1</sup>

Yet today, monism is routinely dismissed as obviously false or merely meaningless. These attitudes are rooted in the philosophical revolts of the early twentieth century. During the early analytic revolt against the neo-Hegelians, Russell and Moore dismissed monism as contrary to common sense.<sup>2</sup> During the positivistic revolt against metaphysics generally, Carnap and Ayer ridiculed the whole debate as mystical nonsense.<sup>3</sup> So the fashions turn.

I will claim that monism was never refuted but only misinterpreted. Monism is now usually interpreted as the view that exactly one thing exists (van Inwagen 2002, 25; Hoffman and Rosenkrantz 1997, 77). On such a view there are no particles, pebbles, planets, or any other parts to the world. There is only the One. Perhaps monism would deserve to be dismissed as obviously false, given this interpretation. *But how uncharitable!*

1. According to Joad (1957, 428), monism in the nineteenth century commanded “a larger measure of agreement among philosophers than has been accorded to any other philosophy since the Middle Ages.” As Schiller (1897, 62) once complained, in a reply to Lotze: “Nothing is cheaper and commoner in philosophy than monism; what, unhappily, is still rare, is an attempt to defend it, and critically to establish its assumptions.”

2. Thus Russell (1985, 36) wrote, “I share the common-sense belief that there are many separate things; I do not regard the apparent multiplicity of the world as consisting merely in phases and unreal divisions of a single indivisible Reality” (compare Moore 1993a, 107).

3. So Ayer (1952, 146) claimed: “The assertion that Reality is One, which it is characteristic of a monist to make and a pluralist to controvert, is nonsensical, since no empirical situation could have any bearing on its truth” (compare Carnap 1959, 67).

The core tenet of historical monism is not that the whole has no parts, but rather that the whole is *prior* to its parts. As Proclus (1987, 79) says: “The monad is everywhere prior to the plurality . . . . In the case of bodies, the whole that precedes the parts is the whole that embraces all separate beings in the cosmos.” Such a doctrine presupposes that there are parts, for the whole to be prior to them. The historical debate is not a debate over which objects exist, but rather a debate over which objects are fundamental. I will defend the monistic view, so interpreted: the world has parts, but the parts are dependent fragments of an integrated whole.

*The plan:* In §1 I will clarify the debate as a debate over which objects are fundamental. In §2 I will argue for the monistic view that the cosmos is fundamental, on the basis of considerations from physics and mereology. I will conclude with a brief appendix on historical matters.

## **1. The Question of Fundamental Mereology**

The debate between monists and pluralists—as I will reconstruct it—concerns which objects are fundamental. In particular it concerns the connection between the mereological order of whole and part and the metaphysical order of prior and posterior. Monism and pluralism will emerge as exclusive and exhaustive views of what is fundamental.

### *1.1. Whole and Part: Mereological Structure*

There is structure to a cat. For instance, the nose is part of the head but not part of the paws. One who noted the existence of the cat, and its nose, head, and paws, but missed the parthood relations between them, would have missed an aspect of the cat. As with the cat, so with the world. One who listed what things exist, but missed the parthood relations between them, would have missed an aspect of the world. Or so I will assume.

In particular I will assume that there is a world and that it has proper parts. More precisely, I assume that there is a maximal actual concrete object—the *cosmos*—of which all actual concrete objects are parts. I should stress that I am only concerned with actual concrete objects. *Possibilia*, *abstracta*, and actual concreta in categories other than *object* are not my concern (deities and spirits, if such there be, are not my concern either). When I speak of the world—and defend the monistic thesis that the whole is prior to its parts—I am speaking of the material cosmos and its planets, pebbles, particles, and other proper parts.

The assumption that there is a world with proper parts may seem modest and plausible, but it is certainly controversial, in at least two

respects. First, it is controversial to assume that there are parthood relations at all. The *nihilist* holds that there are no actual—and perhaps even no possible—instances of the proper parthood relation.<sup>4</sup> Second, it is controversial to assume that there is a world. For instance, the *organicist* holds that there are only particles and organisms, and presumably the actual cosmos is neither.<sup>5</sup>

These two points of controversy are independent. One might deny that there are instances of the proper parthood relation but accept the existence of the world. One would then treat the cosmos as an extended simple.<sup>6</sup> Or one might accept that there are instances of the proper parthood relation but deny that there is a world. The organicist holds this view. If the world is an extended simple, then the monist has won from the start. If there is no world, then the pluralist has won from the start. A substantive debate as to whether the whole or its parts is prior can arise only if the whole and its parts both exist.

Since I will be defending the monistic view, it may be worth saying more in defense of the assumption that there is a world. The existence of the cosmos has both intuitive and empirical support. Intuitively, natural language provides a singular term for this entity (“the cosmos”). The cosmos is hardly the sort of strange fusion undreamt of by common sense. Empirically, the cosmos is the object of empirical study. Indeed it is the primary subject matter of physical cosmology.<sup>7</sup>

The existence of the cosmos can claim further support from mereology. Classical mereology—with its axiom of unrestricted composition—guarantees the existence of the cosmos as the fusion of all actual concrete objects. But any account of when composition occurs that preserves common sense and fits science should recognize the cosmos. It is only the

4. In this vein Rosen and Dorrr (2002, 169–71) recommend a “fictionalist agnosticism” about mereology, according to which talk about parthood relations should be understood as prefixed by a tacit “according to the fiction of mereology” operator.

5. The organicist view is defended by van Inwagen (1990), who later explicitly embraces the consequence that there is no world, paraphrasing “the world” as a plural term (van Inwagen 2002, 127).

6. Horgan and Potrč (2000, 249) forward a view whose main metaphysical theses are: “1. There really is just one concrete particular, viz., the whole universe (the *blobject*). 2. The blobject has enormous spatiotemporal structural complexity, and enormous local variability—even though it does not have any genuine parts.” In Schaffer 2007a, I argue that the best version of nihilism is the monistic version that only posits the world.

7. Thus Hawley and Holcomb (2005, 5) define cosmology as “the study of the formation, structure, and evolution of the universe as a whole.” And Hartle (2003, 615) characterizes “the central question of quantum cosmology” as “The universe has a quantum state. What is it?”

most radical views of composition—views that do not even recognize tables and chairs—that do not recognize the cosmos. Suffice it to say that if the strongest objection to monism is that the world does not exist, then I would think that it is the monist who can claim the mantle of common sense and science.

I should note one further controversial assumption I will be making, namely that *composition is not identity*.<sup>8</sup> In particular, I assume that the cosmos is not identical to the plurality of its planets, pebbles, or particles, or to any other plurality of its many proper parts. If the one literally *is* the many, then monism and pluralism would no longer be opposing views—indeed both “sides” would turn out to be right.

Putting this together, I am assuming that there is a cosmos, that it has proper parts, and that it is not identical to any plurality of its many proper parts. I consider these assumptions very plausible but cannot defend them any further here. My purpose is just to articulate my assumptions, acknowledge where they may be controversial, and explain their role in the debate.

### *1.2. Prior and Posterior: Metaphysical Structure*

The mereological structure of whole and part is not the only structure to the world. There is also the metaphysical structure of prior and posterior, reflecting what depends on what, and revealing what are the fundamental independent entities that serve as the ground of being.

Consider Socrates. Given that he exists, the proposition <Socrates exists> must be true. And conversely, given that the proposition <Socrates exists> is true, there must be Socrates. Yet clearly there is an asymmetry. The proposition is true *because* the man exists and not vice versa. Truth depends on being (Aristotle 1984a, 22; Armstrong 1997, 3). Further, given that Socrates exists, his singleton {Socrates} must exist. And conversely, given that {Socrates} exists, there must be Socrates. Yet—given the iterative conception, on which sets are founded on their members—there is an asymmetry. {Socrates} exists *in virtue of* Socrates and not vice versa. Sets depend on their members (Fine 1994, 4–5). One who noted the existence of Socrates, the truth of <Socrates exists>, and the existence

8. Baxter (1988) is perhaps the main defender of the thesis that composition *is* identity. D. Lewis (1991, §3.6), Armstrong (1997), and Sider (2007) all defend the thesis that composition is *not* identity but is analogous to identity in important respects. I am only assuming the falsity of the Baxter-style view.

of {Socrates}, but missed the asymmetric dependence relations among them, would have missed an aspect of the world. Or so I will assume.

In particular I will assume that there is a relation of metaphysical priority. Moreover, I assume that this relation can hold between entities of arbitrary category—or at least, I assume that this relation can hold between actual concrete objects, which are my current concern. So I assume that it makes sense to inquire as to the dependence ordering (if any) among Socrates' snub nose, his body, and the cosmos that embodies him.

The assumption that there are priority relations between actual concrete objects is weighty and controversial in at least two respects. First, it is controversial to allow that there is such a relation as priority at all. The *metaphysical skeptic* may well refuse to acknowledge the notion.<sup>9</sup> I think the skeptic has missed part of the structure of the world. Anyone who wants to debate the dependence of truth on being, sets on members, or minds on matter, must understand some notion of priority. Anyone who is interested in what is fundamental—where to be fundamental is to be ultimately prior—must understand some notion of priority. Perhaps the notion of priority is amenable to further analysis (see Fine 2001; Lowe 2005; Schaffer 2009). I am doubtful but will remain neutral on that question here. In any case I think that it would be a mistake to insist that this useful and natural notion is illegitimate unless one can display its analysis. By that standard virtually no philosophical notion would count as legitimate.

Second, it may be controversial to allow for priority relations between actual concrete objects. One might allow that there are priority relations between, say, *properties* but refuse to extend the notion of priority further.<sup>10</sup> (Obviously this second point of controversy only arises if the first is surmounted.) That said, the examples of priority mentioned above span various categories. Socrates is an actual concrete object, {Socrates} is an abstract object, and the truth of <Socrates exists> is a fact. So it seems a gratuitous restriction to disallow the prospect of priority relations

9. In this vein, Thomson (1999, 306) decries both ontological and epistemological priority as “dark notions,” though she does immediately allow that “we have *some* grip on what [these notions] are.” Similarly D. Lewis (1999a, 29) advertises supervenience as providing “a stripped-down form of reductionism, unencumbered by dubious denials of existence, claims of ontological priority, or claims of translatability.”

10. For instance, D. Lewis introduces a *naturalness ranking* for properties, but is equivocal as to whether this ranking extends to objects (thus compare Lewis 1999a, 45–46 to Lewis 1999b, 65).

holding between actual concrete objects. That said, if there are no priority relations between actual concrete objects—for either of the two reasons just considered—then the entire debate between monists and pluralists should be rejected out of hand.

I will further assume that the priority relations among actual concrete objects form a well-founded partial ordering. Partial ordering structure may be imposed by treating priority as irreflexive, asymmetric, and transitive. Well-foundedness is imposed by requiring that all priority chains terminate. This assumption provides the kind of hierarchical structure against which the question of what is fundamental makes sense. It is a corollary of the well-foundedness condition that there are basic actual concrete objects. Without a well-founded partial ordering, there would be a third option besides monism and pluralism, on which neither the one whole nor any of its proper parts are basic because no actual concrete objects are basic.

The assumption of a well-founded partial ordering may be understood as a kind of *metaphysical foundationalism*, on analogy with *epistemic foundationalism*. Just as the epistemic foundationalist thinks all warrant must originate in basic warrant and rejects limitless chains of warrant and circular warrant, so the metaphysical foundationalist thinks all being must originate in basic being and rejects limitless chains of dependence (*metaphysical infinitism*) and circular dependence (*metaphysical coherentism*).<sup>11</sup> There must be a ground of being. If one thing exists only *in virtue of* another, then there must be something from which the reality of the derivative entities ultimately derives.<sup>12</sup>

Putting this together, I am assuming that there are priority relations between actual concrete objects, in the structure of a well-founded partial ordering. I consider these assumptions weighty though still plausible but cannot defend them any further here. Once again my purpose is to

11. Lowe (2005, §3) connects the asymmetry of priority to the general asymmetry of explanation: “‘because’ is asymmetrical, because it expresses an *explanatory* relationship and explanation is asymmetrical,” to which he adds: “The asymmetry of explanation is, of course, intimately related to the unacceptability of *circular arguments*.”

12. Aristotle (1984b, 1688) characterizes substance as what is ultimately prior and conceives of such substances as the ground of being: “Substance is the subject of our inquiry; for the principles and the causes we are seeking are those of substances. For if the universe is of the nature of a whole, substance is its first part” (compare Gill 1989, 3; Schaffer 2009). Without such substances there would be nothing at all. As Leibniz wrote to de Volder: “Where there is no reality that is not borrowed, there will never be any reality, since it must belong ultimately to some subject” (quoted in Adams 1994, 335; compare Aristotle 1984a, 5; Fine 1991, 267).

articulate my assumptions, acknowledge where they may be controversial, and explain their role in the debate.

### 1.3. *Fundamental Mereology: The Tiling Constraint*

So far I have discussed the mereological and metaphysical structures of the world. To characterize the debate between monists and pluralists, it remains to connect these structures. For the debate concerns the correlation between the mereological order of whole and part, and the metaphysical order of prior and posterior. Specifically it concerns what is fundamental (ultimately prior) among actual concrete objects. I will now introduce some formalism, use it to state a constraint on what is fundamental, and then (§1.4) characterize the monistic and pluralistic views.

So first, the formalism. I will use “P” to express the relation of part-hood, “D” to express the relation of dependence, and “*u*” as a dedicated constant for the actual material cosmos:

$Pxy = x$  is a part of  $y$   
 $Dxy = x$  depends on  $y$   
 $u =$  the cosmos

As I am concerned only with actual concrete objects, I will use “C” to express this status, which may be defined in terms of being a part of the cosmos:

$Cx =_{df} \exists xu$

Finally I will use “B” to express the crucial status of being a basic actual concrete object, which may be defined as being concrete and not depending on anything concrete:

$Bx =_{df} Cx \ \& \ \sim (\exists y) (Cy \ \& \ Dxy)$

The central question under discussion is the *question of fundamental mereology*, which is the question of what are the basic actual concrete objects. This is the question of what is the ground of the mereological hierarchy of whole and part. In terms of the formalism, this is the question of which entities  $x$  are such that  $Bx$ .

Before canvassing possible answers to this question, it will prove useful to introduce a constraint on possible answers. This constraint is *the tiling constraint*, which is that the basic actual concrete objects collectively cover the cosmos without overlapping.<sup>13</sup> In a slogan: no gaps, no overlaps.

13. As D. Lewis (1986a, 60) says of the sparse properties, “there are only just enough of them to characterize things completely and without redundancy.” The natural



In terms of the formalism, the requirement that the basics cover the cosmos can be expressed as the requirement that the fusion of all the basic entities is the whole cosmos. Using “Sum: $x(\Phi x)$ ” to denote the fusion of all entities meeting description  $\Phi$ , this may be expressed as:

$$\text{Covering: Sum:}x(\text{B}x) = u$$

The requirement that the basics do not overlap is the requirement that no two basic entities have a common part:

$$\text{No Overlap: } (\forall x)(\forall y) ((\text{B}x \ \& \ \text{B}y \ \& \ x \neq y) \supset \sim (\exists z) (\text{P}zx \ \& \ \text{P}zy))$$

The reason for requiring *Covering* is *the argument from completeness*. The first premise of the argument is that the basic entities must be complete, in the sense of providing *a blueprint for reality*. More precisely, a plurality of entities is complete if and only if duplicating all these entities, while preserving their fundamental relations, metaphysically suffices to duplicate the cosmos and its contents.<sup>14</sup>

The second premise of the argument from completeness is that any plurality of entities that did not cover the cosmos would be incomplete. They would fail to provide a blueprint with respect to the portion left uncovered. For instance, if the plurality of basics did not cover this cabinet, then they would fail to specify the intrinsic properties associated with this cabinet and its various contents. That portion of reality would be left ungrounded. Duplicating these basics would not metaphysically suffice to duplicate the cosmos and those of its contents associated with this cabinet.

From these premises, it follows that the basic actual concrete objects must collectively cover the cosmos. This provides a useful constraint on answers to the question of fundamental mereology. For instance, Socrates’ nose will not serve as the one and only basic object. Indeed it is a corollary of the covering condition that, *if* there is exactly one basic object, *then* it must be the cosmos itself. Nothing less will satisfy *Covering*. (A second corollary—which was also a corollary of well-foundedness—is that there are basic objects. Nothing covers nothing.)

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generalization to mereology is provided by Varzi (2000, 286): “A good inventory must be complete: everything in the domain of quantification must show up somewhere. But a good inventory must also avoid redundancies: nothing should show up more than once.”

14. This formulation is a generalization of Jackson’s definition of physicalism in terms of minimal physical duplicates: “Any world which is a minimal physical duplicate of any world is a duplicate *simpliciter* of that world” (Jackson 1998, 160). The generalization is to the claim that any world which is a minimal *fundamental* duplicate of our world is a duplicate *simpliciter* of our world. Though note that I am not using this definition to define what it is to be fundamental but rather just as a constraint on the fundamental.

The reason for requiring *No Overlap* is *the argument from recombability*. It begins from the premise that the fundamental actual concrete objects should be *freely recombable*, serving as independent units of being (building blocks, as it were). Thus each should be, in Hume's words, "entirely loose and separate" (Hume 2000, 58). Somewhat more precisely, a plurality of entities is freely recombable if and only if any combination of ways that each entity can be individually is a way that the plurality can be collectively. If entities are metaphysically independent, then they should be modally unconstrained in combination.

The second premise of the argument from recombability is that overlapping entities are *modally constrained*. Consider two overlapping homogeneously red circles, each of which could individually be homogeneously green. The one circle cannot retain its parts and its redness, while the other circle retains its parts but turns homogeneously green. Otherwise the overlapping part would have to be both red and green. In general, it is not possible to vary the intrinsic properties of the common part with respect to the one overlapping thing, without varying the intrinsic properties or composition of the other.

From these premises, it follows that no basic entities can overlap. Overlap would compromise the modal freedom of the basics. There are *harmony constraints* between overlapping things, concerning their common parts.

The *No Overlap* condition will turn out to be strictly stronger than anything I will need. I will in fact only make use of a weaker condition, which is that no basics are related as whole to part:

$$\text{No Parthood: } (\forall x)(\forall y) ((Bx \& By \& x \neq y) \supset \sim Pxy)$$

This is a weaker condition than *No Overlap*, insofar as (i) if there are basics related as whole-to-part, then there is overlap among these basics at that part, but (ii) if there is overlap among the basics, there need not be relations of whole-to-part (for instance, conjoined twins overlap but are not related as whole-to-part).

The *No Parthood* condition can be independently supported by a second argument, which is *the argument from economy*. The first premise of the argument is that the basic objects should not be multiplied without necessity. More precisely, the basic objects should not be merely complete, they should be *minimally complete*, in having no proper subplurality that is complete.

The second premise of the argument from economy is that entities related as whole-to-part are redundant. This is because every whole

has the *relational intrinsic* property of (i) having so-many parts, (ii) having parts with such-and-such intrinsic properties, and (iii) having parts that are thus-and-so related. For instance, Socrates has the intrinsic property of having a snub nose—any duplicate of Socrates must have a snub nose.<sup>15</sup> Likewise any duplicate of the cosmos must duplicate all of its parts and their intrinsic properties and their relations. Fix the whole, and all its parts are fixed.<sup>16</sup>

From these premises, it follows that the basic objects should not include any entities related as whole-to-part. After all, any complete plurality of fundamentals that includes a whole and one of its proper parts will have a complete subplurality without this proper part, and so fail to be minimal. (Indeed, since duplicating the whole entails duplication of all of its parts, adding the part contributes nothing new to the characterization of reality already provided by the whole.) In general, once a given whole is included among the basics, any mention of its proper parts becomes redundant.<sup>17</sup>

It is a corollary of both the *No Overlap* and the *No Parthood* conditions that *if* there is more than one basic object, *then* the cosmos cannot be basic. For every actual concrete object is part of, and thus overlaps, the cosmos.

Overall, the tiling constraint can be understood as a *partitioning constraint*. Consider all the ways that one may slice a pie. One might leave the whole uncut, or slice it in half, or cut it into quarters, and so forth. One cannot leave any part out. However one cuts, one divides the whole. And one cannot serve any part twice. Each part belongs to one and only

15. For further discussion of intrinsicness and parthood, see Weatherson 2008 and Sider 2007. Weatherson (2008, §2.1) provides the following example: “most people have the property *having longer legs than arms*, and indeed seem to have this property intrinsically.”

16. Thus Armstrong (1997, 12) suggests: “The mereological whole supervenes upon its parts, but equally the parts supervene upon the whole” (compare D. Lewis 1991, 8). Though note that I have only claimed whole-to-part supervenience and that the argument in the main text only works in that direction (the difference between whole-to-part and part-to-whole supervenience being that the property of having-such-a-part is *intrinsic* to the whole, while the property of belonging-to-such-a-whole is *extrinsic* to the part). I will return to the question of part-to-whole supervenience in §2.2.

17. In classical terms, I have argued that *no substance can have substantial proper parts*. Thus Aristotle (1984b, 1643) maintains that “no substance is composed of substances” since a substance must be a *unity*, and so anything consisting of two substances must be “actually two” and so “never actually one” (1984b, 1640). Likewise Spinoza (1994, 93) argues that no substance can have substantial proper parts, or else “the whole . . . could both be and be conceived without its parts, which is absurd.”

one slice. In place of the pie, consider the cosmos. Different answers to the question of fundamental mereology can be seen—in light of the tiling constraint—as different ways of carving up the cosmos into basic pieces. The question of fundamental mereology can be seen as presupposing that there is a metaphysically privileged way to carve up the cosmos, provided by the notion of a basic piece.

#### 1.4. *Monism and Pluralism*

Different answers to the question of fundamental mereology—in light of the tiling constraint—correspond to different ways of carving up the cosmos. One way to carve up the cosmos is to leave the whole uncut. On this view there is one and only one basic actual concrete object, and it is the whole world. This is *Monism*.<sup>18</sup>

$$\text{Monism} =_{df} (\exists!x) Bx \& Bu$$

*Monism* can thus be thought of as the conjunction of the numerical thesis that there is exactly one basic object with the holistic thesis that the cosmos is basic. Given the tiling constraint, each of these conjuncts entails the other. If there is exactly one basic actual concrete object, it must be the whole cosmos since nothing less can cover all of reality. And if the cosmos is basic, there can be no other basic actual concrete object since anything other would be a part of the cosmos. So given the tiling constraint, the following theses are equivalent to *Monism*:

$$\begin{aligned} &(\exists!x) Bx \\ &Bu \end{aligned}$$

Moreover, given the foundationalist assumption of a well-founded partial dependence ordering (§1.2), *Monism* is equivalent to the thesis that every proper part of the cosmos depends on the cosmos. Suppose that *Monism* holds. Given well-foundedness, every actual concrete object must be either basic or dependent on some basic object. By the definition of *Monism*, the cosmos is the only such basis. So every proper part of the cosmos must depend on the cosmos. In the other direction, suppose that every proper part of the cosmos depends on the cosmos. By the asymmetry of dependence, the cosmos cannot then depend on any of its proper

18. In this vein Hegel (1949, 301) holds that what is fundamental is “the organic being . . . in undivided oneness and as a whole,” and Bradley (1978, 521) adds: “Everything less than the universe is an abstraction from the whole.” See the appendix for further historical discussion.

parts. By irreflexivity the cosmos cannot depend on itself. So the cosmos must be basic. Moreover nothing else can be basic since by supposition everything else is dependent on the cosmos. So there can be one and only one basic actual concrete object, namely the cosmos. Thus given metaphysical foundationalism, the following thesis is equivalent to *Monism*:

$$(\forall x) ((Pxu \ \& \ x \neq u) \supset Dxu)$$

The second way to carve up the cosmos is to make some cuts. On this view, there are many basic actual concrete objects, all of which are proper parts of the cosmos. This is *Pluralism*:

$$Pluralism =_{df} (\exists x) (\exists y) (Bx \ \& \ By \ \& \ x \neq y) \ \& \ \sim Bu$$

*Pluralism* can thus be thought of as the conjunction of the numerical thesis that there are at least two basic objects with the partialistic thesis that the cosmos is not basic. Given the tiling constraint, each of these conjuncts entails the other. If there are at least two basic objects, the cosmos cannot be basic, or else there would be whole-part relations among the basics. And if the cosmos is not basic, then there must be at least two basic objects, in order to cover all of reality. So given the tiling constraint, the following theses are equivalent to *Pluralism*:

$$\begin{aligned} &(\exists x) (\exists y) (Bx \ \& \ By \ \& \ x \neq y) \\ &\sim Bu \end{aligned}$$

Moreover, given the foundationalist assumption of a well-founded partial dependence ordering, together with the tiling constraint, *Pluralism* is equivalent to the thesis that the cosmos depends on some of its proper parts. Suppose that *Pluralism* holds. Given well-foundedness every actual concrete object must be either basic or dependent on some basic object. By the definition of *Pluralism*, proper parts of the cosmos are the only such basis. So the cosmos must depend on some of its proper parts. In the other direction, suppose that the cosmos depends on some of its proper parts. Then the cosmos cannot be basic. By well-foundedness, some of these proper parts must be basic. By the tiling constraint, it cannot be that just one of these proper parts is basic. So there must be at least two basic objects. Thus given metaphysical foundationalism plus tiling, the following thesis is equivalent to *Pluralism*:

$$(\exists x) (Pxu \ \& \ x \neq u \ \& \ Dux)$$

It will prove worthwhile to give special mention to a specific form of *Pluralism*, on which the basic objects are all mereological simples. This is *Atomism*.<sup>19</sup>

$$\begin{aligned} \text{Atomism} =_{df} & (\exists x)(\exists y) (Bx \& By \& x \neq y) \& (\forall x) (Bx \\ & \supset \sim(\exists y) (Pyx \& x \neq y)) \end{aligned}$$

*Atomism* is the most fine-grained form of *Pluralism*, cutting the world all the way down to mereologically minimal slices. *Atomism* is also the most thematic form of *Pluralism*—where the monist attributes ultimate priority to the ultimate whole, the atomist attributes ultimate priority to the ultimate parts. I will argue (§2.4) that *Atomism* is the best form of *Pluralism*, but I do not build *Atomism* into the definition of *Pluralism*.

*Monism* and *Pluralism* are exclusive theses. One doctrine holds that the cosmos is basic, while the other denies it. Given the tiling constraint, they are also exhaustive. There are no other possible answers to the question of fundamental mereology. This follows from the fact the *Monism* is equivalent to  $\sim Bu$  given tiling, and *Pluralism* is equivalent to  $Bu$  given tiling, which are exhaustive conditions. Metaphorically speaking, *Monism* is the view that one leaves the whole pie intact, while *Pluralism* is the view that one cuts the pie (and *Atomism* is the version of this view on which one cuts down to the smallest crumb).

By way of concluding this section, it may be worth clarifying five points about *Monism* and *Pluralism*. First, the debate is not over what exists. Both sides can and should agree that the world exists and has parts (§1.1). The debate is rather over what is basic—it is about how to answer the question of fundamental mereology.

Second, none of the views as defined say anything about the relative priority ordering among derivative entities. Thus *Monism* allows that the whole is prior to its parts all the way down the mereological hierarchy. But it also allows that all of the many parts are equally secondary. And it even allows that the many ultimate parts come second in the priority ordering, with metaphysical explanation snaking upward from there. Likewise, *Pluralism*—at least in its atomistic form—allows that the parts are prior to their whole all the way up the mereological hierarchy. But even *Atomism* allows that all but the ultimate parts are equally secondary. And even *Atomism* allows that the one whole comes second in the priority ordering, with

19. In this vein, Leibniz (1989, 213) maintains: “These monads are the true atoms of nature and, in brief, the elements of things,” and Russell (2003, 94) adds: “I believe that there are simple things in the universe, and that these beings have relations in virtue of which complex beings are composed.” See the appendix for further historical discussion.

metaphysical explanation dangling downward from there. The thematic versions of *Monism* and *Pluralism* treat whole-to-part priority *with constancy* all the way along the mereological hierarchy, but I do not require either the monist or the pluralist to be thematic in this respect.

Third, *Monism* and *Pluralism* are both claims about the actual world. Neither says anything about any other worlds. I will argue (§2.2) that whichever of these views of fundamental mereology is actually true should hold with metaphysical necessity. But I do not build this into the definitions of these doctrines.

Fourth, the only assumption that is essential to the debate as a whole is the assumption that there is a priority ordering among actual concrete objects (§1.2). Without that there is no notion of basicness to debate. The remaining assumptions are inessential. The assumption that there is a world helps make *Monism* viable, and the assumption that it has parts helps make *Pluralism* viable. Either of these assumptions could be waived, though the debate would at that point be decided. The assumption that composition is not identity and the *No Overlap* aspect of the tiling constraint both help render *Monism* and *Pluralism* exclusive. These could be waived, though then one would need to consider the prospect that *both* the one whole and some of its many parts are basic. Finally, the assumption of a well-founded partial ordering and the *Covering* aspect of the tiling constraint both help to render *Monism* and *Pluralism* exhaustive. These could be waived, though then one would need to consider the prospect that *neither* the one whole nor a complete plurality of its parts are basic.

Fifth, I have made little attempt yet to argue that these doctrines deserve their labels (see appendix). I am interested in the doctrines themselves. I will be defending the thesis that the cosmos is the one and only fundamental actual concrete object, prior to all of its proper parts. The reader who would not call that *Monism* is welcome to find another label.<sup>20</sup>

This concludes my attempt to clarify the debate. The debate concerns the question of fundamental mereology, which is the question of which actual concrete objects are basic. *Monism* and *Pluralism*—given assumptions that I have tried to articulate—emerge as exclusive and exhaustive possible answers. For the monist, there is one and only one basic

20. Mackenzie (1914, 27) suggests the label *Cosmism*: “A theory may be essentially singularistic, in the sense that it regards the whole of reality as an inseparable unity, no aspect of which is really independent of the rest; and it may yet be pluralistic, in that it recognizes within that unity many fundamental distinctions that cannot be annulled . . . I propose to call it ‘Cosmism’.” Mackenzie nominates Plato, Aristotle, Spinoza, Hegel, Bradley, and McTaggart as fellow cosmists.

object, and it is the whole cosmos. For the pluralist, there are many basic objects, and they are all proper parts of the cosmos.

## 2. Monism: The Priority of the Whole

Which objects are fundamental? Is the one whole—the cosmos—the one and only fundamental object, as per *Monism*; or are some of the many parts fundamental instead, as per *Pluralism*? What is the metaphysically correct way to carve up the cosmos? I will now discuss what I consider to be the four main arguments in the debate and maintain that the monistic side has the better of the arguments.

### 2.1. Common Sense: Parts as Arbitrary Abstractions

It will prove useful to begin with Russell's claim that pluralism is favored by *common sense* since this claim is the source of the contemporary dismissal of monism as being obviously false. So Russell (1985, 36) declares: "I share the common-sense belief that there are many separate things; I do not regard the apparent multiplicity of the world as consisting merely in phases and unreal divisions of a single indivisible Reality." Russell (1985, 48) then frames the debate as a debate between the commonsensical empiricist pluralist who can see that "there are many things" and the wild-eyed rationalistic monist who would argue a priori that there is only one thing. Here is the birth story of analytic philosophy and what has sounded like the death knell for monism.<sup>21</sup>

But analytic philosophy—for all of its many virtues—was born in sin. Russell misinterpreted monism. *Monism* is not the doctrine that exactly one thing exists but rather the doctrine that the one whole is fundamental (§1.4, appendix). Or at least, both the monistic and the pluralistic views under discussion accept the existence of the one whole and its many parts (§1.1). Thus the advocate of *Monism* and Russell's "empirical person" are in perfect agreement over Russell's claim that "there are many things."

If there is to be an argument from common sense against *Monism*, it must be an argument for the *priority* of the parts to their whole. That is, it must be an argument that it is commonsensically obvious that the

21. Russell's argument continues to reverberate. Here is a recent echo from Hoffman and Rosenkrantz (1997, 78): "Monism has an additional very serious disadvantage: it is inconsistent with something that appears to be an evident datum of experience, namely, that there is a plurality of things."



cosmos is not fundamental. In this vein consider the grains of sand and the heap. Intuitively, the grains seem prior to the heap. Thus Leibniz (1989, 213)—with his plurality of fundamental monads—claimed that in general “a composite is nothing else than a collection or *aggregatum* of simple substances” and wrote to Arnauld, “Every being derives its reality only from the reality of those beings of which it is composed” (1989, 85).

On the other hand, the monist may offer a general conception of the *partialia* as abstract, in the etymologically correct sense of being a partial aspect. Wholes are complete and concrete unities. Parts may be conceived of as aspects of wholes, isolated through a process that Bradley (1978, 124) describes as “one-sided abstraction.” The priority of the one whole to its many parts is thus of a piece with the priority of the substance to its modes, both being instances of the general priority of the concrete entity to its abstract aspects.<sup>22</sup>

In my view, common sense has a more nuanced opinion on the priority question. I think common sense distinguishes *mere aggregates* from *integrated wholes*: “that which is compounded out of something so that the whole is one—not like a heap, but like a syllable “ (Aristotle 1984b, 1644). Common sense probably does endorse the priority of the parts in cases of mere aggregation, such as with the heap. Yet common sense probably endorses the priority of the whole in cases of integrated wholes, such as with the syllable. Thus consider the circle and its semicircles (or even more gerrymandered divisions of the circle). Intuitively, the circle seems prior—the semicircles represent an arbitrary partition on the circle.<sup>23</sup> Or consider an organism and its organs. According to Aristotle at least, the organism is prior, and the organs are defined by their functional integration within the organism.<sup>24</sup> Or consider the myriad details of a percept.

22. As Williams (1953, 14) notes: “At its broadest the ‘true’ meaning of ‘abstract’ is *partial, incomplete, or fragmentary*, the trait of what is less than its including whole. Since there must be, for everything but the World All, at least something, and indeed many things, of which it is a proper part, everything but the World All is ‘abstract’ in this broad sense” (see Schaffer 2009, §3.3).

23. Thus Proclus (2007, 55–56) maintains: “The circle is not established from semi-circles but rather the opposite is the case . . . [W]hen the diameter is drawn then at that point semi-circles are made. The name itself proves this, since ‘semi-circle’ has its derivation from ‘circle’ and not *vice versa*.”

24. Aristotle (1984b, 1634) gives the right angle and the acute angle, and the man and his finger, as examples in which the whole is prior to its part: “for in formula the parts are explained by reference to [the wholes], and in virtue also of the power of existing apart from the parts the wholes are prior.”

Here it seems that the percept is prior—the details are just particulars of the overall gestalt.<sup>25</sup> So it seems that, at the very least:

1. According to common sense, integrated wholes are prior to their arbitrary portions.

Further, common sense tends to view the cosmos as an integrated whole (not like a heap, but like a syllable). As Brand Blanshard (1973, 180) declaims, the conviction “of the plain man” and “of most thoughtful minds” is that “the world is not in the final account a rag-bag of loose ends.” Such an intuition echoes through many religious traditions. It is present in Plato’s Timaeon picture of the cosmos as constructed by the demiurge in the pattern of “one visible animal comprehending within itself all other animals” (Plato 1961, 1163). And it resurfaces from reflection on the patterns of nature. Thus Paul Davies (1983, 145) writes, “That the universe is ordered seems self-evident. Everywhere we look, from the far-flung galaxies to the deepest recesses of the atom, we encounter regularity and intricate organization.” Indeed the very term ‘cosmos’ is derived from the Greek term for order. Thus:

2. According to common sense, the cosmos is an integrated whole.

Finally, common sense tends to view the many parts of the cosmos it is concerned with—such as animals and artifacts—as arbitrary parts, in at least two respects. The first arbitrariness concerns *partitions*. Common sense appreciates that there are many ways to carve the world. Consider all the ways that one may slice a pie, or all the ways of drawing lines on a map. There seems no objective ground for carving things in just one way.<sup>26</sup>

The second sort of arbitrariness that common sense recognizes with common objects like animals and artifacts concerns *boundaries*. Common sense recognizes that common objects are all like clouds, blurry at the edges. As D. Lewis (1999c, 165) explains, “There are always outlying

25. As with the percept, so with other mental unities. And so the philosopher who is an idealist might take the seeming priority of mental wholes over their parts as a further argument for monism. Indeed most of the nineteenth-century British monists were idealists first and foremost, and monists as a result. As Joad (1957, 420) explains: “We entertain our ideas, we form our plans as wholes . . . . The wholes of monistic philosophy are in this respect like mental wholes.”

26. In this vein, Dummett (1973, 577) suggests “the picture of reality as an amorphous lump, not yet articulated into distinct objects.” As Campbell (1990, 154)—who defends “Spinoza’s conclusion, that there is just one genuine substance, the cosmos itself”—notes: “There seem to be no natural lines along which Nature admits of partition” (Campbell 1990, 139).

particles, questionably parts of the thing, not definitely included and not definitely not included” (compare Unger 1980). So even if there were some objective reason to prefer drawing a line on the map, say, between mountain and valley, there would still be arbitrariness concerning where exactly the mountain begins. Given the arbitrariness of partitions and boundaries and the focus of common sense on animals, artifacts, and their ilk:

3. According to common sense, the many proper parts are arbitrary portions of the cosmos.

From 1–3, and assuming the consistency of common sense on these matters, it follows that:

4. According to common sense, the cosmos is prior to its many proper parts.

So if anything, it is *Monism* that can claim the mantle of common sense. As confirmation of 4, note that the monistic side has long been the ascendant position in metaphysics and that many of the world’s religions have a monistic character.<sup>27</sup> So—peering beyond the provinces of twentieth-century analytic metaphysics—the overall pull of intuitions across cultures and ages favors the monistic view. Not for nothing did James (1975, 65) acknowledge monism to be “part of philosophic common sense” and pen the following apologetics for his pluralism, which may be worth repeating at length:

It is curious how little countenance radical pluralism has ever had from philosophers. Whether materialistically or spiritually minded, philosophers have always aimed at cleaning up the litter with which the world apparently is filled. They have substituted economical and orderly conceptions for the first sensible tangle; and whether these were morally elevated or only intellectually neat, they were at any rate always aesthetically pure and definite, and aimed at ascribing to the world something clean

27. Indeed, as James (1985, 329–30) points out, monism is a nearly universal feature of religious experiences: “Mystical states in general assert a pretty distinct theoretic drift . . . . One of these directions is optimism, and the other is monism” (compare Huxley 1944, 5). The philosopher who takes religious experiences to be evidentiary (such as Alston [1991]) should regard this as further evidence for monism. In this regard, it may be worth noting that one of the standard objections to treating religious experience as evidentiary is the problem of conflicting experiences, which threaten to provide rebutting defeaters to any particular religious view (Plantinga 2000, 439). Monism may be one of the few features of religious experience not troubled by such conflict, and so—for whatever that is worth—may even deserve special status as a feature of religious experiences unthreatened by such defeaters.

and intellectual in the way of inner structure. As compared with all these rationalizing pictures, the pluralistic empiricism which I profess offers but a sorry appearance. It is a turbid, muddled, gothic sort of an affair, without a sweeping outline and with little pictorial nobility. Those of you who are accustomed to the classical constructions of reality may be excused if your first reaction upon it be absolute contempt—a shrug of the shoulders as if such ideas were unworthy of explicit refutation. (1977, 26)

I thus conclude that it is *Monism*—properly understood as the claim that the cosmos is an integrated whole—that best fits intuitions about priority. Though I should hasten to add that I think this counts for little. At best *Monism* can lay claim to being the default view. Common sense—what Einstein called “a deposit of prejudices laid down in the mind before you reach eighteen” (quoted in Bell 1951, 42)—may favor *Monism*, but it matters little either way.

Glancing back to Russell’s argument from the start of this section, one finds a further puzzling step. Russell claims that the issue is empirical and then invokes what the empirical person would “naturally say.” But why does it matter what the empirical person would “naturally say”? Empirical issues are to be settled, not by appeal to common sense, but by empirical inquiry.

## 2.2. *Quantum Entanglement and Emergence: The Asymmetry of Supervenience*

So what does empirical inquiry reveal? It might seem that current empirical inquiry favors *Pluralism* insofar as physics purports to tell the complete causal story of the world in terms of particles. Thus Paul Oppenheim and Hilary Putnam (1991, 409) speak of a hierarchy of *scientific levels*, where “any thing of any level except the lowest must possess a decomposition into things belonging to the next lower level,” and on which “there must be a unique lowest level,” which they label “Elementary Particles.” As Jaegwon Kim (1998, 15) explains, “The bottom level is usually thought to consist of elementary particles, or whatever our best physics is going to tell us are the basic bits of matter out of which all material things are composed.” If there is to be a good argument for *Pluralism* over *Monism*, it will not be Russell’s argument from common sense (§2.1) but rather Kim’s argument from physics.

That said, there is a gap in the argument from physics. For it is one thing to assume that physics is fundamental, and another to assume that fundamental physics will deal in particles or other wee “bits of matter” (Schaffer 2003; Hüttemann and Papineau 2005). The monist can and

should allow that physics will tell the complete causal story of the world. The monist will maintain that this physical story is best told in terms of fields pervading the whole cosmos, rather than in terms of local particles. What is at issue is not the success of physics, but rather its content.

I will now argue that quantum mechanics is holistic in a way that supports *Monism*. I begin with a description of *entangled systems* in quantum mechanics. An entangled system is one whose state vector is not factorizable into tensor products of the state vectors of its  $n$  components:

$$\Psi_{\text{system}} \neq \Psi_{\text{component-1}} \otimes \Psi_{\text{component-2}} \otimes \dots \otimes \Psi_{\text{component-n}}$$

Thus the quantum state of an entangled system contains information over and above that of the quantum states of its components.<sup>28</sup>

To illustrate, consider the Einstein, Podolsky, and Rosen (EPR) thought experiment, in which two electrons are produced in the singlet state:

$$[\Psi]_{\text{EPR}} = 1/\sqrt{2} [\uparrow]_1 [\downarrow]_2 - 1/\sqrt{2} [\downarrow]_1 [\uparrow]_2$$

Here “[ $\uparrow$ ] <sub>$n$</sub> ” means that electron <sub>$n$</sub>  is in a spin-up state (strictly speaking an up state with respect to some chosen component of spin) and “[ $\downarrow$ ] <sub>$n$</sub> ” means that electron <sub>$n$</sub>  is in a spin-down state. An electron pair in the singlet state is *anticorrelated* with respect to spin. The total spin of the entire system is zero. If one reads the correlation coefficients ( $1/\sqrt{2}$ ) as square roots of the chances of outcomes (Born’s Rule), then electron pairs in the singlet state have a .5 chance of measuring out as electron<sub>1</sub> being spin-up and electron<sub>2</sub> being spin-down, and a .5 chance of measuring out as electron<sub>1</sub> being spin-down and electron<sub>2</sub> being spin-up. Crucially, this system affords zero chance of both electrons measuring out as spin-up, or both electrons measuring out as spin-down. This is the sense in which the electron pair is anticorrelated with respect to spin.

The singlet state seen in  $\Psi_{\text{EPR}}$  is entangled, and as such is not derivable from the state vectors of its two electrons. A pure spin state can be attributed to neither electron individually. A pure spin state can be

28. Schrödinger (1935, 555), who introduced the notion of entanglement, called it “not *one* but rather *the* characteristic trait of quantum mechanics.” Entanglement is a very general feature of the mathematics and has been empirically confirmed by Alain Aspect and others. To the extent we can reasonably expect any feature of quantum mechanics to survive in future theories, we can reasonably expect entanglement to survive. As d’Espagnat (1981, 1804) remarks in this regard: “we may safely say that non-separability is now one of the most certain general concepts in physics.”

attributed to the electron pairs only collectively, as a system. As Michael Esfeld (2001, 252) puts the point: “These properties of the whole contain *all* that can be said about the local properties of the parts, and *only* these properties of the whole contain all that can be said about the local properties of the parts.”

Such entanglement has results that Einstein famously described as “spooky action at a distance.” No matter how far apart the particles are, a spin measurement on one will immediately set the spin state of the other to the opposite (since the spins are anticorrelated). Entangled particles seem as if telepathic. They act as a unit. As Tim Maudlin (1998, 56) concludes: “The physical state of a complex whole cannot always be reduced to those of its parts, or to those of its parts together with their spatiotemporal relations . . . . The result of the most intensive scientific investigations in history is a theory that contains an ineliminable holism.”

So far I have only tried to convey what entangled systems are like. Now the argument from quantum entanglement to *Monism* begins from the premise that the cosmos forms *one vast entangled system*. This can be argued for both physically and mathematically. Physically, one gets initial entanglement from the assumption that the world begins in one explosion (the Big Bang) in which everything interacts.<sup>29</sup> This initial entanglement is then preserved thereafter on the assumption that the world evolves via Schrödinger’s equation.<sup>30</sup> More precisely, the initial singularity is virtually certain (measure 1) to produce universal entanglement, and the Schrödinger dynamics are virtually certain (measure 1) to preserve it. In fact Schrödinger evolution tends to spread entanglements, so that even without initial entanglement, “eventually every particle in the universe must become entangled with every other” (Penrose 2004, 591).

Mathematically, one needs only to suppose that there *is* a wave-function of the universe. Then it is virtually certain that it will be entangled since measure 1 of all wave-functions are entangled. So unless there is a specific form of evolution—such as some form of wave-function collapse—that promotes disentanglement, one should expect universal

29. It is controversial whether the Big Bang is to be treated as *physically real*, or as a mere *boundary condition* (a hole in spacetime). If the Big Bang is a boundary, then the assumption I need is that all causal horizons vanish as one moves to the boundary. Indeed, even if there are nonvanishing causal horizons, this would at most yield a pluralism in letter but not spirit, in which the universe contains many vast isolated bubbles. Everything we ever encounter—everything in our bubble—would still form one entangled system.

30. It is controversial whether temporal evolution is always via the Schrödinger dynamics (*unitarity*), or whether there is a further dynamics of wave-function collapse.

entanglement. Thus—absent wave-function collapse—it seems virtually certain that

5. The cosmos is in an entangled state.<sup>31</sup>

It remains to argue that the entangled universe displays what David Bohm and B. J. Hiley (1993, 352) call an “unbroken wholeness,” in a way that supports monism. It will prove useful to start with a Democritean pluralist picture, featuring particles with intrinsic physical properties in external spatiotemporal relations,<sup>32</sup> and generalize from there. Democritean pluralism cannot provide an adequate basis for entangled systems (see Teller 1986, 71–73; Healey 1991, 405–6). It fails the completeness requirement (§1.3). Thus consider the EPR system’s intrinsic correlational property of having total spin zero. This property is not fixed by the Democritean base—it is not fixed by fixing the quantum states of the two particles, along with their spatiotemporal arrangement. In general, duplicating the intrinsic properties of the particles, along with the spatiotemporal relations between the particles, does not metaphysically suffice to duplicate the cosmos and its contents. The intrinsic correlational properties of entangled wholes would not be duplicated. So on the assumption that the basic actual concrete objects must be complete, Democritean pluralism is ruled out.

Lifting the Democritean supposition, it should be obvious that no movement to larger molecules or further intrinsic properties will help the pluralist find a complete basis for the entangled cosmos. The physical properties of the whole are not fixed by the total intrinsic properties of any subsystems. The only move that seems to help the pluralist attain completeness is to add new fundamental external relations: *entanglement relations*. The pluralist might still maintain that particles are fundamental but now would have them laced together by both spatiotemporal arrangements and correlational entanglements (compare Teller 1986). So, for instance, the EPR particles would not merely be at such-and-such distance, they would also be thus-and-so correlated.

31. As Joos (2006, 226–27) explains, “due to non-local features of quantum theory,” a consistent description of any system “must finally include the whole universe.” According to Zeh (2004, 115), “the essential lesson of decoherence is that the whole universe must be strongly entangled,” where apparent particles “can be dynamically described in terms of a unitarily evolving (hence strongly entangled) universal wave function” (Zeh 2003, 330).

32. D. Lewis’s “Humean supervenience” is a modern variant of Democritean pluralism, on which “all there is to the world is a vast mosaic of local matters of particular fact, just one little thing and then another,” these things being interrelated by “a system of external relations of spatio-temporal distance” (D. Lewis 1986b, ix).

There are, however, at least two main problems with a move to entanglement relations. The first problem is that it is not obvious that the fundamental theory will retain particles—the relata of these proposed entanglement relations—especially when one looks beyond quantum mechanics to relativistic quantum field theory (see Halvorson and Clifton 2002; Kuhlmann 2006, §5). In quantum field theory, “particle number” is just an operator on the field and as such need not have a definite whole number expectation value. How could particles be fundamental if there is not even a fact about how many of them the system has? Moreover, “particle number” is not frame invariant. For instance, there is the Unruh effect in which an inertial observer will observe a vacuum state (fields at lowest energy), while a uniformly accelerated observer will observe many particles. So particles in relativistic quantum field theory seem to assume the same nonobjective status as simultaneity does in special relativity. Thus H. D. Zeh (2003, 330) recommends that we “abandon a primordial particle concept entirely, and . . . replace it with fields only,” noting “this is indeed what has always been done in the *formalism* of quantum field theory.” The formalism looks, on surface, to be treating world-wide fields as fundamental.

The second problem with entanglement relations—purely internal to quantum mechanics, and even granting the presence of particles—is that the unity of properties gets lost. If one treats entangled systems holistically, then one accords them basic intrinsic spin properties, and crucially one can attribute *the very same property* to different systems with different numbers of components. For instance, a single electron, and various systems, might each have the same spin property. But if one treats entangled systems via parts in entanglement relations, then one cannot attribute *the same relation* with different numbers of components. This represents a loss of empirically important unity, as Healey (1991, 420) explains:

As far as its spin goes, it is irrelevant whether or not a system is composed of subsystems: quantum mechanics applies to the spin of a system in just the same way in either case. This is important, since it permits one to treat the total spin of a complex system like a silver atom just as one would that of a spin 1/2 system with no nontrivial subsystems.

I conclude that an entangled system is best treated as a fundamental unit:

6. Entangled systems are fundamental wholes.



From 5 and 6, it follows:

7. The cosmos is a fundamental whole.<sup>33</sup>

And so, given that quantum mechanics (or better, relativistic quantum field theory) represents our best current guide to the structure of reality, it seems that empirical inquiry now favors the holism of the monistic view.

A second argument to *Monism*, the argument from *the possibility of emergence*, lurks behind this first argument. I have argued that quantum entanglement is a case of emergence, in the specific sense of a property of an object that has proper parts, which property is not fixed by the intrinsic properties of its proper parts and the fundamental relations between its proper parts. However the empirical questions ultimately get resolved, it seems clear that this sort of emergence—at the level of the cosmos—is at least metaphysically possible:

8. It is metaphysically possible for the cosmos to have emergent properties.

So consider a world in which the cosmos has such emergent properties. The concrete realm at such a mereologically complex world cannot be completely characterized in terms of any plurality of its proper parts. That is, duplicating any plurality of these proper parts, while preserving their fundamental relations, would not metaphysically suffice to duplicate this possible cosmos. Indeed nothing will suffice to completely characterize an object with emergent properties short of that whole object, or any wider whole that object is part of. And so, given that the basic objects of a world must be complete for that world (this is the natural modal generalization of the completeness requirement: §1.3), among the concrete objects of an emergently propertied world *w*, the whole cosmos of *w* must be basic. So there is a metaphysically possible monistic scenario:

9. It is metaphysically possible for the cosmos to have proper parts but be a fundamental whole.

33. In this vein, Toraldo di Francia (1998, 28) writes, “Since any particle has certainly interacted with other particles in the past, the world turns out to be *nonseparable* into individual and independent objects” (compare Gribbin 1984, 229). Nadeau and Kafatos (1999, 4) maintain that “an undivided wholeness exists on the most basic and primary level in all aspects of physical reality,” invoking “a seamlessly interconnected whole called the cosmos” (1999, 5). Esfeld (2001, 258) concludes, “Only the whole of all quantum systems taken together is in a pure state. . . . Consequently all matter at the level of quantum systems is one holistic system.” And Penrose (2004, 578), from a chapter entitled “The entangled quantum world,” says, “A system of more than one particle must nevertheless be treated as a single holistic unit.”

Now I take it that *Monism* and *Pluralism*, though defined as doctrines about the actual world (§1.4), are metaphysically general theses, in the sense that whichever doctrine is true, is true with metaphysical necessity (compare van Inwagen 2002, 28). Just as the dispute as to whether properties are universals, tropes, or nominalistic constructions is thought to concern a metaphysical necessity, so the dispute over the priority of the whole seems to concern a comparable necessity. Indeed, I take the realm of metaphysical possibility to concern what is compossible with *the laws of metaphysics*, which govern what grounds what.<sup>34</sup> *Monism* and *Pluralism* are rival doctrines about the laws of metaphysics, with respect to the grounding of mereological structure. Thus:

10. Either it is metaphysically necessary for the cosmos to be a fundamental whole, or it is metaphysically necessary for the cosmos (if it has proper parts) to be derivative.

The parenthetical clause in 10 serves to cover the case of a one-atom cosmos, which is the one case in which the pluralist will allow the cosmos to be fundamental.

Together 9 and 10 entail *Monism*, as a thesis about the actual world:

11. The cosmos is a fundamental whole.

In short, if *Pluralism* is true, then it is necessarily true, by 10. But by 9, *Pluralism* is not necessarily true. So it is not true.

An underlying mereological asymmetry comes to light: *the asymmetry of supervenience*. The asymmetry is that the proper parts must supervene on their whole (§1.3), but the whole need not supervene on its proper parts. In other words, though emergence is metaphysically possible, *submergence*—the converse of emergence—is metaphysically impossible. For submergence, the intrinsic properties of the proper parts, along with the fundamental relations between these parts, must fail to supervene on the intrinsic properties of the whole. This is impossible because (i) any intrinsic property of the proper parts ipso facto correlates to an intrinsic property of the whole, namely, the property of having-a-part-with-such-and-such-intrinsic-property, and (ii) any relations between the parts also correlates with an intrinsic property of the whole, namely, the property of having-parts-thus-and-so-related. Fix the whole, and all of its parts are fixed.

34. According to Rosen (2006, 35), the laws of metaphysics “specify the categories of basic constituents and the rules for their combination. They determine how nonbasic entities are generated from or ‘grounded’ in the basic array.”

Given the asymmetry of supervenience, the monist can guarantee a complete inventory of basic objects. The impossibility of submergence guarantees that the cosmos is complete unto itself. But the pluralist cannot guarantee a complete inventory, for no roster of proper parts can be guaranteed complete, given the possibility of emergence. In this sense the whole may well be—and by the lights of our best physics actually is—more than the sum of its parts.

### *2.3. Heterogeneity: Configuring the Many*

There is a very general sort of empirical information, however, that might be thought to favor *Pluralism*. The very general sort of empirical information is that the world is *heterogeneous*, in the sense of featuring qualitative variegation. Some parts are discernible from others.

Heterogeneity is a classic problem for the monist, prefigured in the Parmenidean vision of a perfect homogeneous sphere, which “is all alike; nor is there more here and less there” (Kirk and Raven 1962, 275) and which is “like the bulk of a well-rounded sphere, from the centre equally balanced in every direction; . . . [B]eing equal to itself on every side, it rests uniformly within its limits” (Kirk and Raven 1962, 276).<sup>35</sup> Plotinus (1991, 353) saw this problem:

From such a unity as we have declared The One to be, how does anything at all come into substantial existence, any multiplicity, dyad, or number? Why has the Primal not remained self-gathered so that there be none of this profusion of the manifold which we observe in existence and yet are compelled to trace to that absolute unity?

And Joachim labeled it “the fundamental difficulty” for the monist:

For any monistic philosophy the fundamental difficulty is to find intelligible meaning within its system for the relative independence of the differences of the One . . . . [W]e have One, and find it difficult to reconcile with its Unity the being of a variety or plurality within it. (Joachim 1906, 48–49; compare Ritchie 1898, 469–70)

(Note that Plotinus and Joachim—monists both—are evidently not denying the existence of a plurality but rather trying to account for a diverse plurality from a fundamental One.)

35. Melissus draws a comparable conclusion, as Sedley (1999, 126) notes: “[Melissus] infers homogeneity (it is ‘alike everywhere’), on the ground that anything heterogeneous would thereby be a plurality.”

What exactly is the argument? Presumably the key premise is that any basic entity must be homogeneous. From this premise it would follow that the monist, with one basic cosmos, must have a homogeneous cosmos. And it would follow that the pluralist, with many basic parts, could still have heterogeneity in virtue of these parts *differing from each other*. Thus the pluralist might argue that the heterogeneity of the world can be due only to external differences between *many* internally homogeneous basic bits of being.

More precisely, the key premise would be:

12. Fundamental objects must be homogeneous.

From 12, the refutation of *Monism* would follow swiftly, for it would follow that:

13. If the cosmos were fundamental, then the cosmos would be homogeneous.

When evidently:

14. The cosmos is not homogeneous.<sup>36</sup>

And given 13 and 14, the refutation of *Monism* is at hand:

15. Therefore the cosmos is not fundamental.

But why think that any basic entity must be homogeneous, as per the key premise 12? I can think of two *bad* reasons. First, one might think that a heterogeneous basic entity would in some sense “differ from itself.” But (i) if this were objectionable, the objection would apply equally to the pluralist’s heterogeneous derivative entities—they too would “differ from themselves.” This objection does not succeed in picking out anything special about *basic* objects that requires them to be homogeneous. Also (ii) the thought that heterogeneous basic entities are objectionable may arise from a conflation of numerical difference with qualitative variegation. What is true is that nothing can be nonidentical to itself. What is false is that nothing can be internally qualitatively variegated.

Second, one might think that any heterogeneity demands metaphysical explanation in terms of an arrangement of homogeneous parts. But this is just a demand for an explanation of a particular type of whole from a particular type of part. As such it begs the question against the

36. Though Rea (2001, 147) makes the point that a homogeneous world “does not require us to deny anything that is manifest to the five senses” since these appearances can in principle be written off as false appearances enjoyed by minds that “are not denizens of the material world.”

monist. If there is to be an objection to *Monism* in the offing, there must be an argument against the prospect of explaining heterogeneity by starting from a fundamental heterogeneous whole.

Indeed, the monist can reply that heterogeneous basic entities must be allowed by everyone. For it is metaphysically possible for there to be *heterogeneity all the way down*, in the sense of a cosmos every part of which has heterogeneous proper parts. I will argue for the possibility of gunk (matter every part of which has proper parts) in §2.4. If gunk is possible, heterogeneity all the way down should be possible since such constitutes a consistent distribution of properties over gunk.

At a world that is heterogeneous all the way down, *everything*—including whatever is basic—must be heterogeneous. This shows that it is metaphysically possible for 12 to be false. Further, this scenario shows that the pluralistic strategy of accounting for heterogeneity in terms of differences between internally homogeneous parts is insufficient. As A. E. Taylor (1961, 88) points out by way of *tu quoque*, if the pluralist's basic units of being “have internal variety of their own, [then they] simply repeat within themselves the problem they are supposed to solve.”

What remains is the question of how to give a consistent account of basic heterogeneous entities (which both monist and pluralist require). There are at least three consistent accounts. The first account—which I prefer—is via *distributional properties*.<sup>37</sup> A given whole might, for instance, have the property of being polka-dotted. There would be no question of the whole being “different from itself” or having any other problematic status. The claim that the whole is polka-dotted is a coherent claim, which would entail heterogeneity among its derivative dots and background.

Behind every heterogeneous distributional property winds a bumpy configurational path. A color, for instance, can be represented as a point in a three-dimensional color configuration space (with dimensions for hue, brightness, and saturation). The color of a two-dimensional plane can then be represented as a path in a five-dimensional configuration space, where each point on the plane is represented by  $\langle x, y \rangle$  coordinates and assigned a location in color space  $\langle \text{hue}, \text{saturation}, \text{brightness} \rangle$ . A color-homogeneous two-dimensional plane will trace out a path in this five-dimensional space that is flat along the three color dimensions, while

37. Here I follow Parsons (2004), who offers examples such as *being polka-dotted* and *being hot at one end and cold at the other* and invokes the possibility of heterogeneity-all-the-way-down to argue against the reductionist view that distributional properties derive from a plurality of homogeneous parts.

a color-heterogeneous plane (such as a polka-dotted plane) will trace a bumpy path. Such a path in configuration space specifies a determinate distributional property.

The representation of the heterogeneous world via a configurational space is not metaphysical trickery but standard fare in physics. For instance, in quantum mechanics, the wave function of the universe is standardly represented as a field in configuration space. The field assigns a complex-valued amplitude to each point in the space. Here again there is no question of the world being “different from itself” or having any other problematic status.<sup>38</sup>

For the monist, the general fact that the world is heterogeneous is due to the world’s instantiating the determinable property of *being heterogeneous*. The specific way that the world is heterogeneous is due to the world’s instantiating the determinate property of tracing such-and-such a curve through physical configuration space. Thus the one whole can be parturient.

A second account of heterogeneity is via *regionalized properties*. This account treats seemingly monadic properties as having an extra argument place for a region. So the world might be heterogeneous by, for instance, bearing the redness relation to here and the greenness relation to there.<sup>39</sup>

A third account of heterogeneity is via *regionalized instantiation*. This account, instead of regionalizing properties, regionalizes instantiation (Johnston 1987). So the world might be heterogeneous by, for instance, instantiating-here red and instantiating-there green. Since the regionalization is incorporated in the copula, it may be expressed *adverbially*, as “the world is-herely red and is-therely green,” or “the world is red in a herely way, and green in a therely way.”

In summary, the heterogeneity of basic entities is everyone’s problem. Fortunately for everyone, it is a problem that seems to allow many consistent solutions.

38. Indeed Albert (1996, 277) suggests that the most natural ontology of both Newtonian and quantum mechanics is in terms of a single world-atom moving through configuration space: “The space in which any realistic understanding of quantum mechanics is necessarily going to depict the history of the world as playing itself out is configuration space” (compare P. Lewis 2004).

39. This idea can be thought of as the relativistic extension of the usual endurantist idea that seemingly monadic properties have an extra argument place for a time. Indeed, the problem of the heterogeneity of the cosmos parallels the problem of intrinsic change (temporal heterogeneity) for enduring objects. See Sider 2001 (chap. 4) for further discussion of the problem of intrinsic change.

*2.4. Atomless Gunk: The Asymmetry of Existence*

I turn now to a final argument, which is that the pluralist cannot provide a decent account of the *possibility of atomless gunk*. Gunk is matter every part of which has proper parts, so that there are no ultimate parts to form an atomistic base.

To begin with, there is good reason for thinking that gunk is metaphysically possible (see Schaffer 2003). Gunk is certainly conceivable. For instance, it is conceivable that everything is both extended and divisible. This generates a Zeno sequence of divisions without limit. Likewise Pascal's hypothesis is conceivable, on which there is an endless nested sequence of microcosms, in which every physical "atom" of the universe houses a miniature replica universe, every "atom" of this miniverse houses its own miniverse, and so on without limit. Further, if there are extended material objects that can literally touch, they can do so only at gunky junctures (Zimmerman 1996). Since such literal touching is conceivable, gunk must be conceivable. I do not think that conceivability entails metaphysical possibility, but I do think that inconceivability entails impossibility. So at the very least there is no inconceivability argument against gunk.

Further, there are gunky models of classical mereology (see Simons 1987, 41). So to the extent that the models of classical mereology represent metaphysical possibilities, it follows that gunk is metaphysically possible. Indeed, most alternative views of mereology—save the radical nihilist view on which there are no proper parthood relations at all—allow for gunk. For instance, organicism allows for turtles—or any other organisms—all the way down. Thus consider the rhyme:

Great fleas have little fleas  
Upon their backs to bite 'em;  
Little fleas have lesser fleas,  
And so ad infinitum. (quoted in Bohm 1957, 139)

Likewise accounts of composition that require causal integration or spatiotemporal connectedness allow for gunk.

Finally—and perhaps most tellingly—gunk is scientifically serious. Thus Dehmelt (1989) posits an infinite regression of subelectron structure, Georgi (1989, 456) suggests that effective quantum field theories might form an infinite tower that "goes down to arbitrary short distances in a kind of infinite regression . . . just a series of layers without end," and Greene (1999, 141–42), noting that "history surely has taught us that

every time our understanding of the universe deepens, we find yet smaller microconstituents constituting a finer level of matter,” allows that even strings might be just “one more layer in the cosmic onion.” So to the extent that scientifically serious, empirically open hypotheses ought to be accorded the status of metaphysical possibilities, there is further evidence for:

16. Atomless gunk is metaphysically possible.

Now the monist has no trouble with the possibility of gunk. If the world is gunky, that’s the way the world is. It is such that every part of it has proper parts. Likewise if the world is atomistic, that’s the way the world is. It is such that every part of it has ultimate parts. Likewise if the world contains a mixture of gunk and atoms, that’s the way the world is. It is such that some parts are such that every part of them has proper parts, and some parts are such that every part of them has ultimate parts. The monist can handle any possibility.

But how can the pluralist account for the possibility of gunk (or of a mixture)? There seem to be three main options. First, the pluralist might move to the idea of *endless dependence*, where things get ever more basic without limit. This idea represents the thematic extension of the atomistic motif of part prior to whole.

But endless dependence conflicts with the foundationalist requirement that there be basic objects (§1.2). On this option nothing is basic at gunky worlds. There would be no ultimate ground. Being would be infinitely deferred, never achieved. As Plotinus (1991, 97) argues: “Atoms again (Democritus) cannot meet the need of a base. There are no atoms; all body is divisible endlessly.” The foundationalist requirement is not supposed to be a merely accidental truth of actuality. It is supposed to follow from the need for a ground of being, from which any derivative entities derive. Indeed, if metaphysical possibility concerns what is compossible with the laws of metaphysics, which govern what ground what (§2.2), then foundationalism will be necessarily true if true at all. Hence the foundationalist should endorse the following modal strengthening:

17. It is metaphysically necessary that there are basic objects.

At the very least, it seems a cost of the move to endless dependence (one not incurred by *Monism*) that it requires abandoning this classic foundationalist picture of metaphysical structure.

As a second option, the pluralist might *go disjunctive*, maintaining *Atomism* as a thesis about what is fundamental at the actual world, while



upholding a different—and perhaps even monistic—view of what is fundamental at gunky and mixed worlds.<sup>40</sup> But this idea is at most as plausible as its presupposition that the actual world is nongunky. As noted above, it is an empirically open question whether the actual world is gunky (Schaffer 2003, 502–6).

Moreover, disjunctivism is objectionably *disunified*. If *Atomism* is true at the actual world, then all actual mereological composites are grounded in actual simples. But if this is how grounding works, then—given that metaphysical possibility holds fixed how grounding works—this should be a metaphysically necessary truth:

18. If *Atomism* is true, it is necessarily true.<sup>41</sup>

At the very least, it seems a cost of this disjunctive treatment (one not incurred by *Monism*) that it cannot give a unified treatment of gunky and atomistic scenarios.

Finally, the pluralist might reject *Atomism*, maintaining that what is basic is mereologically intermediate. But this seems objectionably *arbitrary*, especially in cases where there is no natural joint in the mereological structure. For instance, in the case of a homogeneously pink sphere of gunk, all the levels of mereological structure (save for the top) are intermediate, and all are homogeneously pink. No layer of decomposition seems privileged. Homogeneous gunk thus emerges as especially problematic for the pluralist since (i) there are no atoms for the atomist, and (ii) there are no privileged molecules for the molecularist. The only privileged level of structure is at the top.

Further the use of basic molecules is already *quasi-monistic*. Given the tiling constraint (§1.3), no proper parts of any basic molecules can

40. Thus Fine, who is generally sympathetic to the pluralistic view that wholes are constructed out of parts, considers the possibility of “a universe of indefinitely divisible matter” and concedes here that the whole seems basic: “Any uniform piece of matter will then be the aggregate of smaller pieces of matter. But all the same, it is reasonable to suppose that the uniform pieces of matter are all basic” (Fine 1991, 266).

41. Leibniz, Russell, and Wittgenstein all endorse the metaphysical necessity of *Atomism*. Indeed, I think Leibniz, Russell, and Wittgenstein are best read as arguing from the metaphysical necessity of *Atomism* to the impossibility of gunk. As Leibniz (1989, 85) puts the point, to Arnauld: “It will not have any reality at all if each being of which it is composed is itself a being by aggregation, a being for which we must still seek further grounds for its reality, grounds which never can be found” (compare Leibniz 1989, 213; Russell 2003, 94; Wittgenstein 1990, 35). Thus the arguments for the metaphysical possibility of gunk, as per 16, prove crucial. For they provide *independent* rationale for inferring the falsity of *Pluralism* from the possibility of gunk, rather than turning the argument around and inferring the impossibility of gunk from the alleged truth of *Pluralism*.

themselves be basic. Hence the use of basic molecules involves treating the whole as prior to its parts, with respect to the basic molecules and their derivative parts. So it is hard to see how the molecular pluralist could have any principled objection to monism. For instance, if the objection to monism was the “commonsense” objection that parts are prior to their wholes, then the molecular pluralist is equally open to the objection. Or if the objection to monism was from heterogeneity, then given that the basic molecules can be heterogeneous—as is needed to cover the case of heterogeneous gunk—then the molecular pluralist is equally open to the objection. Thus the pluralist seems best advised to accept *Atomism*:

19. If *Pluralism* is true, then *Atomism* is true.

Putting this together, given 18 and 19, it follows that if *Pluralism* is true, then *Atomism* is metaphysically necessary. But given 16 and 17, *Atomism* is not metaphysically necessary since there need not be any atoms. Hence *Pluralism* is false. Or at the very least, it is hard to see how the pluralist can provide an account of gunky and mixed scenarios that can rival the monistic account in unity and elegance. As McTaggart (1988, 172)—though himself a pluralist—puts the argument:

Can we find any fixed points in all this complexity? At present, I think, we can only find one—the universe. If there were simple substances, . . . they would also be fixed points, but the existence of simple substances has not been proved . . . . But the universe does exist, and its position among substances is unique and important . . . . It has thus, objectively, . . . a position much more fundamental than that of most substances, if not all.

A second underlying mereological asymmetry comes to light: *the asymmetry of existence*. The asymmetry is that there must be an ultimate whole, but there need not be ultimate parts. In other words, though atomless gunk is metaphysically possible, *worldless junk*—the converse of gunk, in which everything is a proper part of something—is metaphysically impossible. Classical mereology—with its axiom of unrestricted composition—guarantees the existence of a unique fusion of all concrete objects. Thus there are gunky models of classical mereology, but no junky models. Indeed, a mereologically maximal element is the only individual that classical mereology guarantees on every model. If such models correspond to possibilities, then the only guaranteed existence is the One.

But leaving classical mereology aside, virtually no plausible accounts of when composition occurs allow for junky models. For instance, if composition requires spatiotemporal connectedness, and there is an

infinite sequence of connected objects, each one a proper part of the next, then the fusion of these infinitely many objects should itself be spatiotemporally connected.

Moreover, the impossibility of junk also follows from the platitude that a possible object must exist *at a possible world*. No world—provided that worlds are understood as possible concrete cosmoi—could contain worldless junk because a world that contained junk would be an entity not a proper part of another entity at that world. A world would top-off the junk.

In summary, if the choice is between the ultimate whole and its ultimate parts, and if the choice must be made in the same style at all metaphysically possible worlds, and if there must be a ground of being at all metaphysically possible worlds, then the only choice is the one whole. For only the one whole is guaranteed to exist. Only the monist can provide a unified story of the ground of being for every metaphysical possible world.

This concludes my discussion of arguments. I have maintained that there are physical and modal considerations that favor the monistic view. Physically, there is good evidence that the cosmos forms an *entangled system* and good reason to treat entangled systems as irreducible wholes. Modally, mereology allows for the possibility of *atomless gunk*, with no ultimate parts for the pluralist to invoke as the ground of being. I have also argued that considerations from common sense and from heterogeneity do not favor the pluralistic view. So I conclude that the monistic side has the better of the arguments, or at least the better of the four arguments here considered. *Monism* deserves our serious reconsideration.

## Appendix: Historical Matters

In the main text I have discussed the doctrine that the cosmos is the one and only basic actual concrete object, prior to any of its proper parts, and labeled that doctrine *Monism* (§1.4). I have made only a passing attempt to justify the label. This appendix is for the reader interested in the historical question of whether the label is apt.

Call the interpretation of monism I have offered *the priority reading* and call someone who is a monist in this sense a *priority monist*. Contrast this with the widespread reading on which monism is the doctrine that the cosmos is the one and only actual concrete object in existence. Call this *the existence reading* and call someone who is a monist in this sense an *existence monist*. In the formalism I have been using (§1.3):

*Priority Monism* =<sub>df</sub>  $(\exists!x) Bx \ \& \ Bu$

*Existence Monism* =<sub>df</sub>  $(\exists!x) Cx \ \& \ Cu$

*Priority Monism* is the very same doctrine as *Monism*, while *Existence Monism* is the doctrine that there is one and only one actual concrete object.<sup>42</sup>

*Existence Monism* is a strictly stronger doctrine than *Priority Monism*, in that *Existence Monism* entails *Priority Monism*, but not vice versa. If *Existence Monism* holds, then the cosmos is the only actual concrete object. By the irreflexivity of dependence, the cosmos does not depend on itself. So it does not depend on any actual concrete object. Thus it is basic. And no other actual concrete object can be basic because on this view there is no other actual concrete object. So it would follow that the cosmos is the one and only basic object, as per *Priority Monism*. But *Priority Monism* does not entail *Existence Monism* because the priority monist can and should allow for the existence of many derivative proper parts of the cosmos.

Given the distinction between *Priority Monism* and *Existence Monism*, the question arises as to whether various historical monists are best read as priority monists, or as full-blown existence monists (or perhaps as neither). It seems to me that the priority reading should be preferred to the existence reading if the texts in question can sustain it, on grounds of interpretive charity. After all, *Existence Monism* is a radical view, conflicting with such seeming truisms as Moore's "Here is one hand . . . and here is another" (Moore 1993b, 166). Not for nothing has monism—when interpreted as *Existence Monism*—fallen into disgrace. *Priority Monism* does not conflict with Moorean banalities. It merely entails—sensibly enough—that Moore's hands are not *fundamental* entities (§2.1).

But textual fit is a difficult issue, for at least three reasons. First, there are many historical monists to consider, including Parmenides, Plato, Plotinus, Proclus, Spinoza, Hegel, Lotze, Royce, Bosanquet, Bradley, and Blanshard. I cannot possibly discuss each of these philosophers in any detail here. Second, each of these philosophers has his own idiosyncratic doctrines, and it is highly doubtful that there is any one precisely formulated monistic doctrine that would fit each philosopher in the tradition. Third, many of the texts in this tradition are notoriously opaque, subject to scholarly controversy, and liable to contradictory impulses.

To establish a *prima facie* case for the priority reading, I will proceed by tracing three main threads of the monistic tradition and arguing that each of these threads presupposes the falsity of *Existence Monism*, while being perfectly compatible with *Priority Monism*. So a first main thread in the monistic tradition is that of *the priority of whole to part*. Thus recall

42. For a wider taxonomy of monistic views, see Schaffer 2007b (§1).

Proclus's dictum: "The monad is everywhere prior to the plurality . . . . In the case of bodies, the whole that precedes the parts is the whole that embraces all separate beings in the cosmos" (Proclus 1987, 79). In this vein Joachim (1906, 9–10) speaks of a "whole of parts" wherein "the structural plan of the whole determines precisely the nature of the differences which are its parts."<sup>43</sup> Notice how Proclus and Joachim both speak freely of the parts of the whole.

The claim of the priority of whole to part—which obviously fits *Priority Monism*—is just as obviously incompatible with *Existence Monism*. For *Existence Monism* denies that there are any parts to the whole. Hence it denies that there is anything for the whole to be prior to. Thus any historical monist who claims that the whole is prior to its parts is committed to the existence of the parts, as derivative entities.

A second main thread in the monistic tradition is that of *the organic unity of the whole*. This is a thread that traces back to Plato's *Timaeus*, with its vision of the cosmos as constructed by the demiurge in the pattern of "one visible animal comprehending within itself all other animals" (Plato 1961, 1163).<sup>44</sup> This thread winds through Plotinus's cosmology: "All is one universally comprehensive living being, encircling all the living beings within it, . . . every separate thing is an integral part of this All by belonging to the total material fabric" (Plotinus 1991, 318–19).<sup>45</sup> As Hegel (1975, 191–92) memorably writes,

The limbs and organs for instance, of an organic body are not merely parts of it: it is only in their unity that they are what they are . . . . These limbs and organs become mere parts, only when they pass under the hands of an anatomist, whose occupation be it remembered, is not with the living body but with the corpse. Not that such analysis is illegitimate: we only mean that the external and mechanical relation of whole and parts is not sufficient for us, if we want to study organic life in its truth. And if this be so in organic

43. As Joad (1957, 420) summarizes: "The wholes emphasized by monistic philosophers are, therefore, logically prior to their parts. They are there, as it were, to begin with, and being there, proceed to express themselves in parts whose natures they pervade and determine."

44. Thus Harte (2002, 279) argues that, in the Timaeian cosmology, the parts of the cosmic body are determined by their place in the whole structure. She concludes: "The claim that parts are structure-laden is thus the claim that there is some sort of metaphysical dependence of the parts on the whole."

45. O'Meara (1996, 79) comments: "In Plotinus, as in Plato and Aristotle, the central kind of priority is priority 'by nature' . . . . It is this kind of priority that is the concern of fundamental ontology as an attempt to identify what is fundamental in reality, that on which things depend," where for Plotinus, "The One is that on which all else depends" (1996, 77).

life, it is the case to a much greater extent when we apply this relation to the mind and the formations of the spiritual world.<sup>46</sup>

Notice how Plato, Plotinus, and Hegel all speak of individuals existing within the body of the cosmos.

Such a notion of organic unity is incompatible with *Existence Monism*. The notion of organic unity comes from Aristotle's view of the organism as a substantial whole, whose limbs and organs are dependent on their interrelations within the whole. An organism has parts. Hence any historical monist who speaks of organic unity is committed to the existence of parts to be the limbs and organs (as it were) of the cosmic body. But the notion of organic unity is a perfect fit for *Priority Monism*. Aristotle's view of the organism is that of a unified substantial whole, prior to its parts (like a syllable, not like a heap: §2.1). As such the claim that the whole possesses organic unity is just an expression of the priority thesis that the whole is prior to its parts.

A third main thread in the monistic tradition is that of *the world as an integrated system*. Arguably the seed of this idea can be found in what Spinoza (1994, 82–83) wrote to Oldenburg: “Concerning whole and parts, I consider things as parts of some whole insofar as the nature of the one so adapts itself to the nature of the other that so far as possible they are in harmony with one another.” And thus: “Each body, in so far as it exists modified in a certain way, must be considered as a part of the whole universe, must agree with the whole to which it belongs, and must cohere with the remaining bodies” (Spinoza 1994, 84).<sup>47</sup> Royce (1900, 122) argues that any alleged plurality of real objects would be internally related “so as not to be mutually independent,” such that these must be “parts or aspects of One real being,” in such a way as to render us as “only bits of the true Self” (Royce 1967, 416). And Bosanquet (1913, 37) writes, “A world or a cosmos is a system of members, such that every member, being *ex hypothesi*

46. See Beiser 2005 for a discussion of the “ubiquitous organic metaphors” woven through Hegel’s corpus, with the conclusion that “Hegel’s thinking essentially proceeds from an organic vision of the world, a view of the universe as a single vast living organism” (Beiser 2005, 80).

47. Elsewhere Spinoza (1994, 127) speaks of conceiving that “the whole of nature is one individual, whose parts, that is, all bodies, vary in infinite ways.” See Curley 1969 for further discussion.

distinct, nevertheless contributes to the unity of the whole.”<sup>48</sup> Notice how Spinoza, Royce, and Bosanquet all explicitly speak of members of the system.

The idea of the cosmos as an integrated system is incompatible with *Existence Monism*. For *Existence Monism* denies that there is anything other than the cosmos. Hence it denies that there are any things to be integrated into the cosmos. Thus any historical monist who claims that the cosmos is an integrated system is committed to the existence of the parts, as what are integrated in the whole. As Taylor summarizes:

The world for knowledge must . . . be an orderly whole or system . . . . Therefore it must certainly be one; it cannot be a medley of independent elements which somehow luckily happen to form a coherent collection. But again, because it is a system, it cannot be a mere unit; it must be the expression of a single principle in and through a multiplicity of terms or constituents. (Taylor 1961, 94–95; compare Ewing 1934, 87)

But the idea of the cosmos as an integrated system is a perfect fit for *Priority Monism*. For the idea is that the individual parts are fragments that are dependent on their integration with each other into a common whole. As Joachim—in the course of interpreting Spinoza—expresses the idea:

A single “extended” thing—a particular body e.g.—is finite and dependent; a fragment torn from its context, in which alone it has its being and significance. Neither in its existence nor in its nature has it any independence. It owes its *existence* to an indefinite chain of causes, each of which is itself a finite body and the effect of another finite body; it owes its *nature* to its place in the whole system of bodies which together constitute the corporeal universe. (Joachim 1901, 23; see Schaffer forthcoming)

I have so far explained why three main threads of the monistic tradition fit with *Priority Monism* but not with *Existence Monism*. I would add that many of the historical monists directly deny *Existence Monism*. For instance, Bosanquet (1911, 260) explicitly acknowledges “subordinate individuals” and is concerned only to deny that a part can be “in the full sense a substance” (1911, 253). Perhaps most memorably, Alexander (1950, 347) concludes the first volume of *Space, Time, and Deity* with the words: “[The parts]

48. Thus Blanshard (1973, 145) approvingly describes Bosanquet’s thesis in *Principle of Individuality and Value* as: “the world is a single individual whose parts are connected with each other by a necessity so intimate and so organic that the nature of the part depended on its place in the Absolute.” Blanshard (1939, 516) himself defends the view that “the universe of existing things is a system in which all things are related internally.”

are not the whole reality but they are real in themselves . . . . The One is the system of the Many in which they are conserved not the vortex in which they are engulfed.”

I would further add that most historical pluralists have taken themselves to be involved in a debate over what grounds what. Thus Leibniz (1989, 85) maintains that the whole exists in virtue of its parts: “Every being derives its reality only from the reality of those beings of which it is composed.”<sup>49</sup> James (1977, 33) speaks of going “from parts to wholes,” claiming “beings may first exist and feed so to speak on their own existence, and then secondarily become known to each other.” And McTaggart (1988, 271) expresses his commitment to pluralism as follows:

If it is asked which aspect is more fundamental, the answer must be that pluralism is the more fundamental, because . . . the primary parts, which are a plurality, have this position of unique significance. It expresses the relations of the universe and the primary parts more appropriately—so far as we can determine those relations *a priori*—to say that the universe is composed of the primary parts than to say that it is manifested in them. And this leaves the balance on the side of pluralism.

Indeed, even Russell (2003, 92)—though sometimes guilty of misreading monists as existence monists—puts his own positive doctrine in terms of dependence: “The existence of the complex depends on the existence of the simple, and not vice versa.” The pluralist no more need deny the existence of the one whole, than the monist need deny the existence of the many parts.<sup>50</sup>

This concludes my case for the priority reading. I have argued that the priority reading is more charitable and provides a better textual fit. But perhaps closer readings of the relevant texts will reveal that both *Priority* and *Existence Monism* are interwoven into the monistic tradition.<sup>51</sup> If so, then I would suggest that *Priority Monism* is the strand of the monistic tradition worth reviving. Or perhaps closer readings will reveal that the

49. Leibniz’s monads are ideal entities that transcend space. So his view is strictly neutral on the priority of the whole to its parts within the cosmos. On this issue Leibniz actually sides with *Monism*: “In the continuum, the whole is prior to its parts” (quoted in Levey 1998, §3).

50. Indeed, James (1975, 66) ridicules just this sort of confusion coming from monists, in the era when monism was ascendant: “It is an odd fact that many monists consider a great victory scored for their side when pluralists say ‘the universe is many’. ‘The Universe!’ they chuckle—‘his speech betrayeth him. He stands confessed of monism out of his own mouth’.”

51. I would consider Parmenides (see Owen 1960) and Melissus (see Sedley 1999) to be existence monists, and Horgan and Potrč (2000, 2007) are certainly existence monists.



traditional monists—despite the passages I have cited—have all been existence monists after all. If so, I would still recommend the question of fundamental mereology as an intrinsically interesting question in its own right, albeit one with less historical depth.

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## Monism: The Priority of the Whole

Jonathan Schaffer

Which is prior, the whole or its parts? The *monist* holds that the whole is prior to its parts, and thus views the cosmos as fundamental, with metaphysical explanation dangling downward from the One. The *pluralist* holds that the parts are prior to their whole, and thus tends to consider particles fundamental, with metaphysical explanation snaking upward from the many. There seem to be physical and modal considerations that favor the monistic view. Physically, there is good evidence that the cosmos forms an *entangled system* and good reason to treat entangled systems as irreducible wholes. Modally, mereology allows for the possibility of *atomless gunk*, with no ultimate parts for the pluralist to invoke as the ground of being.

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