

University of Groningen

Bodies and Their Potential Parts

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Published in:
The Philosophy of Kenelm Digby (1603–1665)

DOI:
[10.1007/978-3-030-99822-6_10](https://doi.org/10.1007/978-3-030-99822-6_10)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2022

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Georgescu, L. (2022). Bodies and Their Potential Parts: The Not-So-Friendly Reception of Digbean Quantity. In L. Georgescu , & H. T. Adriaenssen (Eds.), *The Philosophy of Kenelm Digby (1603–1665)* (pp. 223–246). (International Archives of the History of Ideas Archives internationales d'histoire des idées; Vol. 239). Springer. https://doi.org/10.1007/978-3-030-99822-6_10

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Chapter 10

Bodies and Their Potential Parts: The Not-So-Friendly Reception of Digbean Quantity



Laura Georgescu

Abstract To Digby's contemporaries, he is a corpuscularian philosopher committed to mechanical explanations. Typically, both corpuscularianism and mechanism are taken to entail a commitment to actual parts. However, Digby rejects actualism about parts, and endorses strong potentialism. The result puzzled his contemporaries. This chapter investigates how some of his readers responded to him on this point, with the purpose of clarifying how his corpuscularianism and mechanism play out in the context of his potentialism. I argue that, rather than the impediment to corpuscularianism and mechanism that it might seem, Digby's potentialism allows him to circumvent various problems that arise in other models.

In 1644, in Amsterdam, Descartes published his *Principia Philosophiae*. The same year, in Paris, Kenelm Digby published the *Two Treatises* (on the body and on the soul). In the first treatise, Digby articulates a 'fully worked-out system of mechanical philosophy' (Henry 2010, 43; see also Henry 1982, 213–5), in which natural phenomena are to be explained by material bodies and their motion. Unsurprisingly, Digby's contemporaries unproblematically saw him as a corpuscularian.¹

In this chapter, I set out what it means for Digby to have this 'fully worked out' system of mechanical and corpuscularian philosophy, given his underlying commitment to potentialism about (all) parts. It is, on the face of it at least, unclear how mechanism or corpuscularianism could be built on top of potentialist foundations. When we think of a mechanical program, we generally think of something broadly Cartesian—a billiard ball model of some sort. That is, we think of physical phenomena reducing to the motions of lower-level parts—that what the whole does is to be

¹On Digby's corpuscularianism, see Kargon 1966, 72–73, Clucas 1997, 271–72, Tutino 2008, 143.

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explained in terms of what its component parts do. This implies a commitment to the actuality of those lower-level parts. After all, if the higher-level phenomenon is the product of the lower-level components, those components had better actually exist; arguably, we might well assume that the parts are more fundamental than the whole. In other words, mechanism, and perhaps corpuscularianism, seems to presuppose actualism about parts. It is tempting to understand Digby's natural philosophy in these terms: given our intuitive conception, it is natural to expect Digby to reduce higher-level phenomena to their composition from lower-level parts. The upshot of such an approach is that it makes Digby's avowed potentialism look more like actualism in disguise. Without some sort of compositional account, the worry presumably goes, Digby's proposal is going to look incoherent.

I do not think that need be the case. I take it that one of the things that is *interesting* about Digby's treatment of body is the marrying of potentialism with mechanism and corpuscularianism. Digby gives an alternative to the standard, and by now intuitive, conceptions—an alternative underpinned by different, but nevertheless materialist, principles.

As Digby sets out his system in the *Treatise on Body*, he does not make it explicitly clear how the potentialism, mechanism, and corpuscularianism are supposed to cohere. It is this slight vagueness, I suspect, that makes it so easy to fall into compositional, actualist-in-disguise, readings. In what follows, I look at how his contemporaries challenged his views on quantity and potentialism. I discuss the arguments raised by Alexander Ross, Joseph Glanvill, and Margaret Cavendish, alongside responses from Digby and his collaborator Thomas White, looking at the implications of these critiques and defences for Digby's commitment to potentialism. Ross, Glanvill, and Cavendish have very different philosophical commitments and motivations for their criticisms. But I take their discussions to be useful tools for disentangling Digby's views and their implications.

10.1 Digby's Corpuscularian Bodies

Digby's contemporaries read his programme as a commitment to corpuscularianism. For instance, Glanvill writes,

The Digbaean, Atomical Opinion is *notoriously* known to have been the way of Democritus and Epicurus, which Aristotle frequently and professedly opposeth. (Glanvill 1676, 60 (my italics))

Similarly, in the *Confession of Nature Against Atheists* (1669), Leibniz—while praising Digby for his project of reconciling Aristotelianism and the new philosophies—counts Digby as a corpuscularian philosopher, alongside Descartes, Bacon, Galileo, Hobbes, and Gassendi. To many of his contemporaries, Digby simply is a corpuscularian.

On Leibniz's account, a corpuscularian philosopher is someone (1) who does not appeal to God or incorporeal substances to explain natural phenomena, and (2) who

relies instead on appeal to bodies and their ‘primary qualities’, i.e., magnitude, figure, and motion alone. If this warrants someone the label of a corpuscularian philosopher, then Digby fits the bill. He leaves no explanatory role for substantial forms, real qualities, God, or self-motion in his natural philosophy.² He is also deeply committed to talking about ‘atoms’, and he claims that ‘the nature of bodies, their qualities, and their operations, are compassed by the mingling of atomes’ (TT 343).³

For Leibniz, however, the corpuscularian mechanical project fails, since the primary qualities of a given body cannot be derived from the notion of the body as ‘that which exists in space’ (Leibniz 1989, 110). The notion of body as that which exists in space explains why a body has corporeal dimensions (i.e., breadth, depth, and length) in general, but it cannot explain why a given body has the particular, determinate corporeal dimensions that it has, rather than such-or-such other dimensions.

The mechanist has two possible rebuttals here. The first is deflationary: determination of magnitudes is primitive, such that a given body just has *the magnitude it has* eternally, and each body just is that body with those determinations. This solution violates the principle of sufficient reason: since eternity is not a cause, the specific determinations of that body remain unexplained. A second option for the mechanist is to claim that the determinations of any given body are the result of that body’s having been acted upon by other bodies. But this solution raises the following concerns: (a) it admits that a body’s primary qualities are not intrinsic to the body itself, but dependent on the interactions between that body and other bodies, and (b) it cannot explain why a given body should have any determinations of magnitude and figure prior to being acted upon by some other body. In both cases, the primary qualities of bodies that the corpuscularian commitments entail remain unexplained (Leibniz 1989, 111). Given that natural philosophy was broadly defined as the science of body, this would leave it without its object.

Digby would agree with Leibniz’s general sentiment: the principles of natural philosophy have to be such that both the properties and operations of bodies are explained. But Digby would disagree with Leibniz’s account of body. For Digby, to treat body as a figured volume of space endowed with a given magnitude is already to go beyond the fundamental level. That the sensible bodies around us are the kinds of things which seem to have more or less stable figures, which are more or less firm, which are more or less elastic, and so on—these are phenomena to be accounted for through the principles of bodies; they are, crucially, not themselves the principles of bodies. Digby’s alternative definition is peculiarly minimalist: a body is

²On the relation between metaphysics and natural philosophy and the proper domain of substantial forms in Digby, see Adriaenssen and de Boer, 2019.

³Similarly, in *A late Discourse... Touching the Cure of Wounds by the Powder of Sympathy*, he introduces six principles of what he qualifies a ‘demonstration’ of the fact that the Sympathetic cure works by natural means, and many of these principles posit atoms. For instance, the second principle reads: ‘The Light glancing so upon some body, the rayes which enter no further but rebound from the superficies of the body, carry with them some small particles or atomes’ (Digby 1664, 154).

something divisible; it is the kind of thing—the kind of substance—that *can* receive parts. It has the capacity of ‘being divided’ (TT 10).

10.2 Divisibility and Body

On Digby’s account, to say that a body is a substance that can be divided is to say that it is a substance ‘endowed’ with quantity. Quantity is the first ‘affection’ of body ‘and the root of it all’: it is that which gives body parts (TT 4–5).⁴ From the fact that a body can receive parts, we can derive two more notions: rarity and density. These three ‘radical’ notions constitute the most basic principles of bodies, and Digby builds an account of the operations and properties of sensible bodies from them:

I haue taken my beginnings from the commonest things that are in nature: namely, from the notions of Quantity, and its first differences: which are the most simple, and radicall notions that are, and in which all the rest are to be grounded. From them I endeauour by immediate composition of them, and deriuation from them, to bring downe my discourse to the Elements, which are the primary, and most simple bodies in nature. (TT preface)

If being endowed with quantity means being divisible, Digby argues, we have our first ‘difference’ of bodies, rarity and density.⁵ If something that receives quantity is

⁴The metaphysical commitments in Digby’s account of substance and quantity are not entirely clear. What kind of a thing is quantity? Is it the ‘essence’ of body? It is somewhat clear that there can be no bodily substance without quantity, but it is not immediately obvious that quantity is the ‘essence’ of body since Digby claims: (1) that there is a ‘metaphysical composition’ of quantity and substance, (2) that quantity and substance are ‘condistinguished’ and have a ‘real’ division, and (3) that one can vary without the other. Is, then, quantity an accident? But here as well, we can raise similar worries. Can we treat it as real accident, in the sense of a thing with its own being? Digby explicitly rejects real accidents, and also cautions against attribution of being to things that cannot subsist on their own. On his account, the mind’s most basic operation is predication of ‘being’ to whatever it receives in apprehension. It is the basic trait of the human mind to turn our apprehensions into existents. Frequently, this is a misattribution, since only things that can subsist on their own—substances—have actual being. So, if real accidents exist, they must exist as substances. It would seem then that, in Digby’s theory, to claim that quantity is a real accident is to claim that it is a substance. But nowhere does Digby claim that quantity can exist on its own. If it is not a real accident, what kind of accident is it? We also have the further problem that, while Digby is willing to claim figure or temperament to be corporal accidents (TT 415), he does not explicitly qualify quantity as an accident. Is it, then, the nature of bodily substance? But what would this mean? The overly long observations in this footnote just go to show that the specific metaphysical status of Digbean quantity is far from clear; no specific commitment will be endorsed in this paper. On an extremely illuminating treatment of these thorny issues in Digby, see Adriaenssen (this volume).

⁵According to Digby, the essence of rarity and density is a ‘proportion of quantity to substance’, and presupposes a composition of substance and quantity somewhat distinct from the composition and division of bodies (TT 24). Digby’s claims about the ‘proportion’ and composition of substance to quantity are not easy to grasp and have raised some objections from his contemporaries, e.g., Hobbes and Ross. Charleton, although he does not explicitly mention Digby, seems to recog-

something that is in principle a unity that can be broken down into a multiplicity (by the definition of body as a thing that can have parts), then it follows notionally, that the thing can be broken into a greater or lesser number of parts. More concretely, density and rarity are spelled out in relation to a thing's capacity to resist division into a multiplicity: for a body to receive more parts relative to its substance is for that body to have less resistance to division than another that receives fewer parts.⁶ A body of more resistance to division—and thus which receives fewer parts—is denser than one of less resistance to division. This is what Digby takes to be the 'most basic difference' of bodies.

Suppose, as a thought experiment, that two bodies with different resistances to division interact. The result is that one body acts as the divider and the other as the divided. This is the operation of division itself. Its first effect (i.e., the first thing that derives from division) is local motion—since dividing entails changing your situation, or place, relative to surrounding bodies.⁷ Out of the density and rarity and the upward or downward motion of the divided and dividing bodies, Digby builds the traditional elemental qualities (hot and cold, moist and dry) and the simple elemental bodies.⁸

The pure elements are not bodies that we encounter in the natural world: we won't come across a lump of pure earth. But one can manipulate and operationalise the 'qualities' of these elements, since the elements retain their 'nature' in mixtures. The properties of sensible bodies (malleability, combustion, liquidity, etc.) indicate an 'excess' of an element (or a mixture of two elements) in the mixed body, and we account for such a property in terms of that excess. The natural kinds (combustive bodies, gases, juices, coagulated bodies, etc.) are grouped based on such excesses: for instance, 'coagulated juices' are bodies in which the 'mixture' of 'fire and earth [is] in an overruling proportion over air and water' (TT 126). This is, principally, what it means for the elemental bodies to be retained in mixtures as 'heterogeneous' parts. The elements are naturally existing things, but they do not exist in bodies in

nise that this is a distinctive feature of the Digbean project: 'Others, by an excessive acuteness of Wit, dividing the Substance of a Body from the Quantity thereof, and distinguishing Quantity from Extension' (Charleton 1654, 17).

⁶Here is Thomas White on the same point: 'it being apparent, that some things are more easie, others harder to be divided, or (which is the same) some are more, others less divisible: if that which causes Motion forces a lesse against a more divisible, the more divisible must of necessity be cut asunder, and admit in the lesse divisible between its parts' (White 1656, 42–43). For an overview of White's system, see Southgate 1993 and Tutino 2008.

⁷Upon division, the divided parts join with other parts. One might suspect that the reason for this is a commitment to plenism. Since Digby follows the Aristotelian line of argument against vacuum, it follows that the world is a plenum. In a plenum, separating from one part necessarily entails joining to another part. However, this is not the reason Digby invokes. What explains the fact that upon division the divided parts join to other parts, Digby claims, is the nature of quantity.

⁸It should be noted, however, that Digby's goal is to reduce the traditional Aristotelian elements and their qualities to what he takes to be the differences of bodies that can be accounted for from the nature of body as a thing with parts: the differences between elements are not qualitative differences, but are the differences in the operations of density and rarity.

the way that corpuscles-understood-as-components are supposed to. At the ‘lower’ elemental level, we are not interested in traditional ‘corpuscularian’ qualities, such as determinate magnitudes, shapes, and arrangements of these elements or specific motions (be they local or vibratory motion).⁹ Central to the elements as *explanans* are these over-proportions of some element (or a mixture of elements) over the other elements and elemental qualities.¹⁰

This reading already puts Digby at odds with a straightforward compositional corpuscularianism. But there is another piece of the puzzle which complicates things further. As we have seen, the essence of Digbean quantity is divisibility. But, Digby goes on to claim, if quantity is divisibility—a *capacity to be divided*—then the parts of quantity are not given: a divisible body is, by definition, not a *divided* body. The parts of a body are not actual, then, but potential (see TT 10–14). In fact, Digby will go on to argue, philosophers who take a continuous quantity to have its parts actually are led into absurdities and impossibilities, because actualism about parts entails indivisibles: if parts are actual, the only possible resolution of a continuous quantity is into indivisibles. But indivisibles—given either a finite quantity of them or an infinity thereof¹¹—cannot compose a continuous quantity.¹² Additionally, indivisibles cannot be corporeal substances, since quantity is the necessary and sufficient condition for a thing (a substance) to be a body. Digby argues against those who hold that some parts are actual and some potential, on the basis that one cannot formulate a principled way to establish the cutting point, at the very least not without dramatically altering the concept of part.

Digby’s commitment to quantity and potential parts has received some attention: for Holden (2004, e.g., 93–95), Digby’s commitment to potential parts shows his allegiance to scholastic philosophy. Pasnau (2011, 621–23) disagrees. Contra Holden, Pasnau maintains that Digby’s specific version of the potential part theory is too radical for many of the scholastics. In a recent article, Pécharman (2020) reconstructs the role played by Digby’s commitments to quantity as divisibility and to potential parts, and the way in which those commitments are supposed to lead to a proof that the soul must be an immaterial immortal substance. The following sections contribute to this debate in so far as they closely examine how some of Digby’s early readers understood and responded to Digby’s treatment of quantity as

⁹White, makes the point thus: ‘The Elements, therefore, are Bodies distinguisht; purely, by the differences of rare and dense . . . [T]is evident, that no bounds or figures do, properly, belong to the Elements, out of their own principles, that is, precisely by their own nature’ (White 1656, 52).

¹⁰A way to interpret this as a transition to corpuscularianism is to interpret Digby as part of the *minima naturalia* tradition. There are good reasons to do so, since Digby does claim (at least a couple of times) that there are such minima of these elements: the atoms. See for instance Clericuzio 2000, 81–86.

¹¹Digby seems to explicitly reject Galileo’s solution in *The Two New Sciences*. Galileo holds that a continuous quantity is composed of immeasurably small elements. This entails a version of atomism, which makes use of a notion that gets close to infinitesimals, but which Digby seems willing to find unintelligible. Consequently, Digby further extends the defence of (Galileo’s antagonist in the dialogue) Simplicius’ view.

¹²Digby uses arguments which go back to Aristotle’s *Physics*.

divisibility and the consequent commitment to potentialism about parts. The point of my discussion in the next sections is not principally to set out the historical contributions to the debate, but to spell out how Digby's commitments contribute to making sense of his version of corpuscularianism and mechanism.

10.3 Ross on Digby on Quantity

One of the first direct objectors to the *Two Treatises* was the conservative Aristotelian, Alexander Ross, in *The Philosophical Touchstone, or Observations upon Sir Kenelm Digbie's Discourses* (1645). On Ross's understanding, Digby's project failed, because his principles are 'Heterodoxal, and not consonant to the principles of Divinity and Philosophy' (Ross 1645, 2). Where Digby took himself precisely to have successfully merged Aristotelian philosophy with the new, more mechanistic, projects, Ross complained precisely that Digby's commitments dissented from Aristotelianism because of an insufficient grasp of scholastic teaching in metaphysics and psychology.¹³ Digby's account of quantity is one of the 'heterodoxical' Digbean principles that Ross attacks.

For Ross, Digby's notion of quantity is confused because, on his reading, it (1) conflates extension with divisibility and (2) makes extension the essence of quantity, when extension and quantity are distinct notions. He argues for this via angels and non-quantitative extensions: angels are unextended beings, with discrete number, i.e., angels exhibit non-extended quantity, while the extension of site (location) and 'the *quidditative* or *entitive* extension', by which one part is not another in bodies, are non-quantitative extensions (Ross 1645, 3).

Let's start with the claim that angels have discrete quantity, which Digby would simply deny. Of course, Digby does not deny that there is a plurality of angels, but this does not amount to affirming that angels enjoy discrete quantity. Saying that there are, e.g., a thousand angels is irrelevant: for a substance to enjoy quantity requires a relation between that substance and some unit measure that the substance can *contain* within it. But, when you count angels, each angel-substance is a unity: it's plurality *of* substances, rather than plurality *within* a substance that is at stake. Moreover, in the *Treatise on Soul*, Digby asserts,

All Metaphysikes abstract from quantity: the investigation of God, of Angels, of the soule it selfe, eyther concludeth immateriality, or at the least worketh about it. (TT 409)

¹³Coming from Ross, this general criticism should not be too surprising. In an early book, *Commentum de terrae motu circulari* (1634), he attacked heliocentrism. In 1646, in *The new planet no planet*, he attacked Copernican principles again, this time in the context of a debate with John Wilkins, while, in 1653, he published an attack on Hobbes' materialism, in *Leviathan* drawn out with a hook. Ross is not widely discussed today. For brief overviews of his historical role and projects, see Allan 2001, 68–94 and Levitin 2015, 123–24.

Angels do exist, but, because they are immaterial substances, they are not the kind of beings about which quantity can (in any meaningful sense) be predicated. What makes something material is that it is the kind of thing in which quantity inheres. It is quantity that gives the substance its materiality.¹⁴ Angels are not such beings. Given the separation between material and immaterial substances based on quantity, Digby concludes that investigation into the location of immaterial substances involves a category mistake.¹⁵ Immaterial substances—souls, Angels—exist, but they exist without location:

to be in a place is nothing else but to be in a circumstant body; and so what is not in a body it is not in a place. Therefore, as it were an absurd illation to say it is, therefore it is in a body, no less is it to say it is therefore it is somewhere; which is equivalent to in some body. ... it is evident, to those who are truly learned, that incorporeal substances are not in Place. (TT 424)

To attribute location to everything that exists is to mistake everything that actually exists for body. And everything that actually exists is not bodily, at the very least because there are operations we recognise in ourselves—apprehending, understanding, etc.—that Digby takes himself to have shown cannot follow from the operations of bodies. So there must be something that exists and is not body. Now, on Digby's account, if something is not a body, it necessarily has no location, and so there is no reason for him to accept Ross's objection that extension of site is not quantitative. For Digby, any intelligible sense of location—and there is only one such intelligible sense, the Aristotelian notion of place—is, contra Ross, quantitative. Digby explicitly makes place one of the subspecies of quantity. To claim otherwise is, for him, simply to attribute a material property to an immaterial substance.

The case of 'entitative extension' is not much different. We get entitative extension just because one part of a body is not another part. Ross does not explain his position here, but there are at least two possible interpretations. First, entitative extension need not be something positive in its own right: the parts of a body are entitatively distinct in themselves, and there is nothing above this self-determination of each part to appeal to. Digby is not forced to assent to this view, however: on his view, the parts of a body are not actual in the first place. The second possibility is that entitative extension is something positive insofar as it *is* a principle of individuation in its own right: entitative extension is that in virtue of which one part of a continuous being is not another part of that continuous being. On this reading, what matters is that Ross denies 'quantitativeness' to entitative extension: it is that which explains the *partes extra partes* structure of bodies, and nothing more. But, for Digby, part of what quantity does is precisely to explain and secure this *partes extra partes* structure. In fact, this is really the main function of one of the sub-species of

¹⁴We know that Digby claims that substance and quantity are distinct (perhaps even really distinct); that in which quantity inheres is distinct from quantity. It is unclear whether this 'substance' can exist without quantity. But what it is clear is that in itself it does not yet have corporeal dimensions. It is quantity that gives it its corporeal dimensions.

¹⁵See Adriaenssen (this volume) for Digby's criticism of the notion of *ubi*.

quantity, place. In which case, any notion of entitative extension is either ultimately quantitative or it's redundant.

The final objection Ross raises is that Digby conflates extension with divisibility:

Secondly, [You define quantity to be nothing else but the extension of a thing] and shortly after [that quantity is nothing else but divisibility.] Thus you confound extension and divisibility, which differ as much, as in man rationality differs from risibility, the one being the effect of the other; so therefore things are divisible, because they are extensive; take away extension, divisibility faileth; and therefore numbers are not properly divisible, because they have no extension, but only in resemblance. (Ross 1645, 2–3)

For Ross, a body's property of divisibility depends on its more fundamental property of extension. A body is divisible just because it is extended. Unextended things—and the example he gives here is number—are simply the kind of thing that cannot be divisible, exactly because they are unextended. To understand precisely how Ross conceives of the relation between extension and divisibility, the analogy he makes between these two properties of bodies and the properties of rationality and risibility in humans is particularly useful.

Scholastic logic admits of properties that are non-essential, but that follow from the essence of the substance of which they are properties: (1) that which belongs to the species, but not necessarily to all of its members, such as the skill of carving wood in humans; (2) that which belongs to all members of the species, but not exclusively to them, such as the property of having fingernails; (3) that which belongs to all members of a species, but does not belong to them at all times, such as having wrinkles; and (4) that which belongs to all members of the species at all times, without being constitutive of their essence. For this latter type of attribute—commonly known as a *proprium quarto modo* (property of the fourth kind)—the capacity for laughter (or risibility) in humans is typically used as an example.¹⁶ I take Ross's point here to be that divisibility is a property of the fourth kind: it is proper to all bodies, and each body is at all times divisible, but to be divisible is neither essential nor basic to bodies. Extension, however, is essential and basic. For Ross, divisibility is merely a necessary property of bodies that follows from extension. If Digby were to accept the account of extension that Ross works with here, he would indeed be susceptible to the objection Ross raises: he would conflate an (or *the*) essential property of body—being extended—with one of its properties of the fourth kind—its divisibility.

Digby, however, does not accept the account of extension that Ross uses.¹⁷ To understand Digby's position on the exact relation between the notions of extension and divisibility, we have to go back to his foundational notion for bodies: quantity. As we have seen, for Digby, the proper definition of quantity is divisibility. That is, divisibility is the essence of quantity. Following Aristotle, quantity is of two kinds:

¹⁶In the early modern context, see Descartes' treatment of impenetrability as a *proprium quarto modo*. See Schmaltz 2020.

¹⁷An interesting case is Pierre Bayle's treatment of divisibility as identical with extension because *proprium quarto modo* is a contradictory notion. For anyone who wants to maintain that Digby identifies extension with divisibility, Bayle's reasoning might help their case.

discrete (number) and continued (extension). Because the essence of quantity is divisibility, discrete quantity (number) is also divisible. That is, contra Ross, number admits of parts. Digby is clear that this is his view:

For if we consider any number whatsoever, we shall find the essence of it, consisteth in a capacity of being resolved and diuided into so many unities, as are contained in it; which are the partes of it. (TT 9)

Number . . . is diuisible into so many determinate partes, and is measured by unities, or by lesser numbers so or so often contained in a proposed greater. (TT 15)

So, for Digby, to determine a number is to determine how many complete—and, where appropriate, incomplete—units of some other unit measure the number contains. Take the number 6. For Digby, to determine 6 is to ask how many units of another unit measure are parts of 6. When the unit measure is, say, 3, then 6 is that which contains two-unit measures of 3. Conversely, there are two-unit measures of 6 in 12. The same applies for the unit measure 1: there are 6 units of unit measure 1 in 6. The two situations are similar because, in both cases, the determination of some discrete quantity presupposes the use of unit measures. And, as Pécharman (2020) shows, this means that Digby's theory of number departs from the Aristotelian position. For Aristotle, 1 is a unity, not a number. For numbers, 1 is the principle by which they are determined, such that any number is a multiplicity of 1. For Digby, this is not the case. Any number whatsoever can act as a unit measure for another number. Number 1 is just one such unit measure among many. Digby's revision of number theory consists in taking number as discrete quantity to be essentially divisible, that is, for any number, parts can be made out of it. Since divisibility commits one to potential parts, determinable via whatever unit measure is given, we cannot privilege one unit measure over another: 1 cannot be the privileged unit measure for the determination of another number. So, in the case of discrete quantity, Ross's objection misses the mark against Digby's theory of discrete quantity. The case of continued quantity, or extension, is similar. For Digby, the essence of continued quantity is divisibility. In which case, Digbean divisibility is not a property of the fourth kind, as Ross would have it.

Ross's objections, then, have no teeth by Digby's own lights. And it is instructive just why they fail to bite: Ross assumes a compositional corpuscularianism, with Cartesian extension as its ground. But Digby's position is stronger than Ross realises. He does not confuse extension with divisibility precisely because he makes the former derivative of the latter. Not coincidentally, Digby also has no need for non-quantitative forms of divisibility. While an actualist about parts might need some additional way to maintain the distinction between *partes extra partes* in a composite, one of the strengths of Digby's potentialism is that his definition of quantity gives him sufficiently robust potential *partes extra partes* for free.

10.4 Glanvill on the ‘Absurdity’ of Potential Parts

In the essay, ‘Of scepticism and certainty’ (1676), written in response to Thomas White’s *Scire, sive sceptices & scepticorum a jure disputationis exclusio* (1663), Glanvill objects to White and Digby’s potentialism by showing that the ‘grounds’ of the view are ‘weak and insufficient’ (Glanvill 1676, 63).¹⁸

Glanvill accepts that Digby and White’s notion of quantity as divisibility is distinct from the notion of quantity as extension:

The formal nature of *Quantity* is *Extension*, in the Notion of *Aristotle’s* Schools; and *divisibility* in the Philosophy of Sir *K. Digby*, and our Author; both which *suppose parts* and *parts actual*. (Glanvill 1676, 63)

He denies Digby’s claim that divisibility entails potential parts. For Glanvill, whichever notions of quantity—extension *and* divisibility—one might work with, the commitment to actual parts stays intact. This does not, however, mean that Glanvill takes on board the Digbean notion of quantity as divisibility. Where Digby argues that divisibility as the ‘essence’ or the ‘nature’ of quantity takes priority over extension (i.e., three-dimensionality, magnitude) because extension as magnitude is a mere ‘species of quantity’, Glanvill, like Ross, resorts to the view that extension is the prior notion, both ontologically and epistemologically; in which case, the notion of divisibility has to depend on, that is, be derived from, the notion of extension.¹⁹ If quantity as extension is indeed the prior notion out of which divisibility follows, then the reason for positing potential parts undoubtedly is weak. But, as we have seen, Digby is not forced to accept that extension is the prior notion.

Another basis for potentialism that Glanvill finds unsatisfactory is Digby’s claim that commitment to actual parts necessarily entails commitment to indivisibles. Digby’s argument is simple: if the parts of extension are actual, then *all the parts* have to be actual. In other words, there cannot be any part that is actual and yet further divisible (if there were, it would already entail that some parts are admitted as merely potential, and not actual). But it is exactly this—to be a part that is actual and yet essentially not further divisible—that is the proper notion of an indivisible. Therefore, Digby argues, commitment to actual parts entails commitment to indivisibles. But an extended quantity cannot be composed of indivisible parts, because anything extended is necessarily divisible. Therefore, the parts of extension cannot be actual.

¹⁸The ‘Of scepticism and Certainty’ is the second essay in Joseph Glanvill’s collection *Essays on Several Important Subjects* (1976). White’s *Scire* was translated into English as *An exclusion of scepticks from all title to Dispute: being an anser to the Vanity of Dogmatizing* (1665). The references to White are to the English edition (unless specified otherwise).

¹⁹Unlike Descartes, Glanvill does not see extension as fully basic, however. He seems to take extension to be derivative of impenetrability: ‘but extension is before it, in Nature, and our Conception; and it is is the received Notion, though I think Impenetrability is the truer’ (Glanvill 1676, 65).

Glanvill is sympathetic to this argument. But, on his account, all it shows is a limit of knowledge. It shows that, indeed, we cannot straightforwardly explain how extension is composed of indivisibles. Indivisibles are ‘abstruse’, inconceivable entities. In that case, it just means that they cannot be used as part of a positive argument for potentialism. The actualist’s *apparent* forced commitment to indivisibles cannot, on Glanvill’s telling, be used to reject the ‘plain and obvious’ fact that extension has *partes extra partes*, merely because ‘indivisible’ is a notion that falls outside our epistemic limits.

Glanvill also worries about the status of the notion of quantity as a common notion. Digby had argued in the opening chapters of the *Two Treatises* that one of the strengths of his conception of quantity as divisibility is that it is the *proper* common notion of quantity, in that it best captures how we actually make use of the notion.²⁰ To ask about the quantity of something is, Digby notes, to ask how many of something else are in it. To ask about a quantity is really to ask about how many unit measures of whatever is being used as that unit measure there are in something. To ask how wide this computer screen is is to ask how many centimetres (or inches, etc.) are ‘in’ it. Glanvill does not seem convinced: he remarks that the shift from quantity as extension to quantity as divisibility, and from parts of extension to potential parts, or possibilities of division, presupposes a departure from the ‘common Speech of all Mankind’ and not a specification of it. He takes it that the notion of parts as ‘possibilities of division’ does not capture the commonsensical understanding that parts are integral parts (Glanvill 1676, 64).

Glanvill misses Digby’s point. For Digby, the conception of parts as ‘possibilities of division’ is already part of the notion of quantity, because the determination of quantity presupposes a *comparison* between two things where one acts as a measure for the other. To conceive of the parts of something is to use something else as a measure to determine these parts:

If then, anyone be asked what quantity there is in such a thing or how great it is, he will presently in his understanding compare it with some other thing (equally known by both parties) that may serve as a measure unto it. (TT 9)

It is this *comparison* between two things that is so central to quantity as a common notion: it works by taking one thing as a unit measure for another thing. For Digby, the atomist who builds up medium-sized bodies out of atoms does exactly the same thing: she takes a given medium-sized body and asks how many atoms and what kind of atoms are in it. It is only because she has committed herself to the existence of such atoms and uses them as a measure that she can claim them to be the integral parts of the medium-sized body. Such worries, however, are difficult to address satisfactorily, since they already presuppose distinct commitments to or against potential parts.

So why does Glanvill reject potential parts? For Glanvill, whether one defends a notion of quantity as divisibility or a notion of quantity as extension, one presupposes actual parts. Suppose the proper notion of quantity is extension. Extension

²⁰On common notions in Digby, see Nauta (this volume), Blank (this volume).

entails actual parts for two reasons: (1) to be extended is to have *partes extra partes* and (2) to conceive of an extended thing is to conceive of something with really distinct parts (which need not necessarily be spatially separated from one another). Glanvill argues that, similarly, quantity as divisibility works by actual parts. He offers a few reasons for this, to which we turn next.

His first claim is that quantity as divisibility presupposes actual parts because a thing cannot be divided (physically: it cannot be naturally broken apart or split) unless the divided parts already actually exist in the body. The reason for the claim is straightforward:

Divisibility is founded upon *real distinction*, and 'tis impossible to divide that which is one without any diversity (Glanvill 1676, 64).

That which is a unity—a true whole—cannot be the subject of ‘diversity’, i.e., it cannot be subject to being made many: ‘*Separability* must suppose *Diversity*’ (Glanvill 1676, 65). For parts to be separable requires them to be already actual. Separability here, for Glanvill, means physical splitting: for A and B to be separated is for A and B to be literally ‘cut’ or separated at their border. It is, as Glanvill puts it, separability in the ‘mechanical sense’. Physical separability is grounded in, Glanvill claims, real distinctness, but real distinctness does not necessarily entail separation: two substances or two parts of the same substances can be really distinct without having these actual parts ‘physically’ separated.

Suppose the two Cartesian substances, mind and body. Descartes explicitly argues that mind and body are really distinct because each substance is understood through its own attribute. But, as Rozemond (2011) argues, it need not follow from their real distinction that they are separate. If mind and body are distinct yet not separate, then asking about the place of the mind or the locus of the interaction of mind and body is really translating the claim from real distinctness to separation. Ultimately, Rozemond’s point is that Descartes used a Suarezian notion of real distinctness which does not entail separation. On that notion, separability is a *sign* of real distinctness, but substances can be really distinct without being separate.²¹ Glanvill holds a similar view:

it is not conceivable how a thing can be extended but by parts, which are really *distinct* from one another, though not *separate* (Glanvill 1676, 64).

Separability is the greatest Argument of *real distinction*; especially that which the Schools call *Mutual* (Glanvill 1676, 35).

Real distinctness informs us about the being and existence of some substances (or parts of the same substance): it is a metaphysical criterion. Separability informs us about spatial and causal (mechanical) relations between bodies. Glanvill’s point is that this possibility of physical division, of literally breaking or cutting apart, needs to be grounded metaphysically, and that this is the function of real distinctness—a body can be split not only because we have an appropriate measure with which to

²¹ Normore (2008), makes a similar argument about Cartesian bodies: each part of extension is really distinct from any other part of extension and thus constitutes a genuine particular corporeal substance. We get substances all the way down.

do so, but also because it is metaphysically and fundamentally already a diversity of actual parts, such that the possibility of it to be made many is grounded. In Glanvill's words,

[bodies] ought to be divers in their Being, before they can be separated, and distinct in their Quantity. (Glanvill 1676, 65)

It is real distinctness that grounds both the physical possibility of splitting and the conceivability of extension as entailing *partes extra partes*. Without a distinction in reality of the parts, the conceptual distinction cannot be explained. We do conceive of part A of a body by distinguishing it from part B, but if these parts are not really distinct, then we do not have any grounds for the distinction we are making.

To see the point about physical cutting in a little more detail, let's briefly return to the Cartesian body. The attribute of Cartesian body is extension—a body just is a bit of extension. And extension entails divisibility; that is, for Descartes, the divisibility of body is grounded in extension. If we plug this into Glanvill's objection, we see why one might want to argue that the Cartesian body has to be a diversity of actually extended and distinct parts, and not a true unity. But, in the Digby–White model, the body *is* a true unity, since they both take the nature of Quantity itself to be 'unity':

The nature of quantity; whose essence is to have partes sticking together, or rather, to have such vnity, as without it, all diuisibility must be excluded. (TT 35, see also TT 118)

But, Glanvill objects, if a body is a genuine unity, then how can it be split into many? If we follow Digby's account of quantity strictly, we would have to conclude that by dividing we do not obtain the aggregate of parts—the building blocks from which a given body was built—but distinct and complete bodies in themselves: that is, new wholes, rather than parts of the original whole. Digby's physics suggests that something like this is the case. As mixed bodies interact with other mixed bodies, given their relative densities, what follows is an act of division, of small bodies being cut off from the divided body and, by the same act, mixed in, or composed with, other bodies. The divided parts—which Digby most frequently calls 'atoms' (and, once, 'minima naturalia')—are, Digby and White want to claim, genuine unities. And, taken on their own—rather than in interaction with other bodies or under different measures—so are the mixed bodies from which these atoms were divided.

For Glanvill, the view of a mixed body as a genuine unity—a continued quantity in which parts are not really distinct—leads to a contradiction. We experience bodies endowed with contrary qualities:

For the same body may be seen, and not seen, black and white, hot and cold, moist and dry, and have all other the most contrary Qualities. . . . [S]uch a capacity of receiving things so different cannot be in the same Subject without the supposal of parts actually distinct and divers. (Glanvill 1676, 64)

We experience contrary qualities as inhering in the same body. On pain of contradiction, such inherence of contrary qualities ought not to be possible in a unity whose parts are merely potential. The actualist accounts for the co-inherence of contraries with facility, since the contrary qualities inhere not in a single unity but

in the distinct actual parts of the body. The potentialist, however, is left having to explain the inherence of contrary qualities in the same ‘simple’, not-actually-diversified, subject. If contrary qualities are to inhere in the same subject, they can only inhere in distinct parts of the same subject; it is a contradiction for both moistness and dryness to inhere in the same part. In which case, the parts in which these contrary qualities inhere must be actual and distinct: ‘distinct possibilities are founded on distinct actualities’ (Glanvill 1676, 64).

Glanvill notes that Digby and White considered the objection from contrary qualities. But he glosses over the answers as unsatisfactory. Here is White’s version of the reply:

Contradiction is only in respect of our Understanding; wherefore, the Contradictories have only a *notional* repugnance in the Subject, as it is in *our Understanding*. Since then, the parts have a distinct being in our Understanding; from thence ‘tis that they are capable to sustain Contradictories (White 1656, 30–31).

Glanvill, understandably, is puzzled by this solution, and offers the following rebuttal:

certainly, the Subject sustains the Contradictories as it is *in re*; I have never heard of a Notion, *black or white, hot or cold*, but in a *Metaphor*. . . . [T]he Real Substance is the Subject of these Contraries, which were impossible, if it had not divers Realities answering to the Qualities that so denominate (Glanvill 1676, 65).²²

Glanvill’s position is clear: the subject in which these contrary accidents—say, hot and cold—inhere is a substance. But if the same substance accommodates contrary qualities, it must have actually distinct parts in which these qualities inhere. Moreover, a notion, insofar as it denotes something, cannot simultaneously denote both a thing and its contrary.

The rebuttal is intuitive enough to suspect that Digby and White would not have been ignorant of the point it expresses. So, we would do well to suppose that Glanvill’s reply does not hit its target. This means that we have to make sense of White’s claim in a somewhat different way. For starters, understanding is an operation of the soul. ‘Contradictories’ and ‘contraries’ come up as the effects of having compared and ordered our notions. The soul, as Digby puts it, is, foundationally, a comparing power (TT 360). But there is no similar operation corresponding to bodies in themselves. Bodies themselves are not the kinds of things that can partake in operations of ‘comparing’, so contradictions are, strictly speaking, not the sorts of things that can exist in bodies. It is our understanding that judges that what we judge to be contrary qualities in the same (bodily) subject are to be avoided, but there is nothing in the subject as body to constrain the same diagnosis. Insofar as the things affecting our senses are bodies, we cannot conclude from body alone that contrary qualities *cannot* reside in the same body. We have to use considerations about contraries and contradictions to help us in properly ordering our notions, but, from this

²²I will ignore, perhaps unwisely, the equivocation between contradictories and contraries in this discussion.

it does not follow that we have a *proof* that the same body cannot sustain contrary qualities.

Contra Glanvill, both Digby and White would insist that contrary qualities are not in fact 'in' the bodily subject. Take Digby's example of a rod that is only half visible. He claims that, strictly speaking, it is a mistake to infer that one part of the rod is visible, while the other is not. The rod does not show itself 'according to the possibility of being the other of the two things, it may be made by division' (it is not that there are two actual parts to the rod, one seen and one unseen) but only according to the 'possibility of being one new thing', i.e., the seen rod (TT 14). In the context of sense perception, the rod has the power to be seen and not be seen. Sight does not pick out the seen part, by distinguishing it from the unseen part. The eye apprehends the seen part as a complete whole. We correct this in judgment precisely because the rod is in fact entire. To suppose that the seen and the unseen parts are actually given is either to claim that the rod is actually a juxtaposition of the seen part and the unseen part, each of which has its own distinct boundary, or to suppose that the senses discern an indivisible such that the seen part and the unseen part are actually distinct parts of the same continuous whole. None of this is the case.

The above argument might seem to hold for secondary qualities. It seems less clear how it applies to contrary qualities in the absence of sense-dependence. What, for instance, about the most fundamental form of this problem, the four elemental qualities? How can moistness and dryness be 'in' the same substance if the substance is a unity with no actual parts? The actualist has an easy answer here: the substance is moist in this part, dry in this other part. This is not a route open to the potentialist. Digby's approach amounts to a rejection of the original question, rather than a means of answering it. This is because the question itself is posed in actualist terms, making it a trap for the potentialist: if I ask why this substance is both moist and dry, I seem to be asking a question about the static composition of the substance—'why does this substance have both moistness and dryness *in* it?'. I suspect that Digby would take this to be the wrong kind of question, expecting the wrong kind of answer. Of course, he will not be able to explain a body's properties in terms of a static composition of parts. The parts are not actually there to act as explanantia. The parts are, however, potentially there. What does that mean in terms of explanatory options? It means that the parts would be actual under some operation of division: for the moist/dry substance in question, it means that it is dividable moistness-and-dryness-wise.

Thus, when Digby explains, for instance, the fluidity of quicksilver in terms of it having an overabundance of watery parts, while it might be natural to understand this in terms of a static composition (there are a lot of actual water-parts present in quicksilver, and their presence explains its fluidity), that cannot be what is at stake. Indeed, Digby's account of quicksilver makes no reference to a static composition; rather, it discusses the watery parts obtained through the operation of division by fire, and it discusses how quicksilver is generated through operations of watery elements (TT 125). When Digby explains in terms of the interactions of watery, airy, fiery, and dry parts, it is in relation to an operation (e.g., calcination, dissolution, etc.) or an effect (pliability, stretching, etc.) of the body. There is an operational

story to be told about the production of a given body, and there is an operational story to be told about the division of a given body. What is not available is a descriptive account in terms of the static composition of a body: a body has no static composition because it can only be a true unity; consequently, compositions can only be dynamic for Digby—they are operational, and not structural.

10.5 Actualism, Potentialism, and Cohesion

Digby (and White) have resources to defend their commitment to potential parts. But does it make a difference if one endorses actualism or potentialism? Take for instance the problem of the cohesion of bodies. The problem of cohesion is the problem of how the parts of bodies are united, or 'glued' together, to form durable wholes. This can be seen as a problem in physics or in metaphysics. In the case of physics, the phenomena associated with cohesion are (1) that a body is firm to the touch (i.e., it shows solidity), and (2) that a body has some resistance to dissipation upon collision with another body. In the case of metaphysics, the issue is what makes a collection of parts a (unitary) *body* as opposed to an aggregate. We want to explain the distinction between, say, a heap of sand (as a mere aggregate of individual bodies) and a piece of copper (which we regard as a unified body). The hylomorphist solution uses substantial forms to account for the difference. The strict corpuscularian does not have that option.

In the *Vanity of Dogmatising* (1661), Glanvill addresses three possible corpuscularian solutions to cohesion: the Cartesian option of cohesion by relative rest, an atomist solution of 'hooks' between atoms, and a revised Cartesian solution. Cartesian cohesion by rest has appeal: parts that cohere move together and are at rest in relation to one another; if relative motion is the cause of the breakage and dissipation of parts, then a body's contrary state, relative rest, is the cause of cohesion. For this solution to work, motion and rest have to be distinct modes of a body. Glanvill does not attack this metaphysical commitment. Instead, he sets out two problems with it: cohesion by rest (a) fails to explain why some bodies are easier to break than others and (b) puts the cohesion of an aggregate and that of a whole on a par (if the parts of aggregated bodies are at rest in relation to one another, they cohere just as much as the parts of a single body).

On Glanvill's account, the atomist's solution fails because it leads into an infinite regress. For the atomist, a body is a true unity of atoms, because its atoms, although separated by void, are chained together by 'hooks'. But, now, we might ask, what makes the parts of these hooks cohere? If we answer that the hooks themselves are made up of chains of atoms, these atoms would have to be connected by hooks and so on *ad infinitum*. Or, to avoid the regress, we would have to admit mere juxtaposition of parts.

The third solution revises the initial Cartesian solution by making cohesion a function of both the parts of a body being at rest relative to one another *and* their being spatially close to one other, i.e., their compactness. In the Cartesian model,

compactness and dispersion are consequences of the porosity of bodies: the fewer and/or smaller pores a body has, the more compact its parts, and therefore the denser it is. Ultimately, then, a body's cohesion is explained by density: a denser body has its parts packed more tightly together than a rarer body. Upon collision with another body, a body whose parts are more compacted will have more resistance to breakage than a body whose parts are more dispersed. Here, the actual volume of space the body occupies remains irrelevant: density is a function of the compactness of parts, but is indifferent to the actual sizes of those parts. A body's increase in density and rarity does entail a change in the volume of space the body occupies, but that change is a sensible effect of the increase or decrease of the distance between the parts through the modifications of the size of the pores. Glanvill raises empirical objections: highly porous bodies—sponges, or elm wood, for instance—have more resistance to breakage than less porous bodies, such as glass or crystal (Glanvill 1661, 52).

Glanvill does not entertain the deflationist solution of dispelling the worry in terms of its cogency: to ask about the cohesion of a body's parts is to suppose that the body is *made up* of parts that do not yet form a unity, but has to somehow be made into a unity by some property of the parts, or of something superadded to them. For the atomist, the atoms are the building blocks that make up medium-sized bodies, and atoms have ontological priority since they are preserved throughout the dissolution of the medium-sized body. Given this ontological priority and atoms' conservation through alterations, questions about the cohesion of medium-sized bodies are inescapable. Yet, this is precisely what, in response to Glanvill, and following what he calls the 'Digbean way', White rejects (White 1665, 46). For Digby and White, a body is already a unity, so there is no reason to worry about how parts cohere into a unity, precisely because the body is an unbroken continuous whole.²³ In this way, the coherence of the body is a given, and need not (indeed, cannot) supervene on relations between its parts.

The physical questions related to cohesion, such as solidity or resistance to dissolution, are viable questions, and, for Digby and White, various classifications of bodies in terms of resistance to dissolution in various contexts were subject to empirical investigation. There is no a priori story to be told about which bodies will have more or less resistance beyond the extent to which the density of the four elements affords their resistance to division. For mixed bodies, empirical investigation is necessary. The question remains, however: why claim that the body is a unity? Two reasons are invoked by Digby and White: that substances are unities and that the body as continued quantity is already a unity. White does not discuss the first in his response to Glanvill, but he makes use of the second, albeit in a roundabout way:

For, if there be any, by its *very being a Continuum*, of necessity it must be whereof parts *may* be made, not wherein parts *are*; else . . . the same thing would be one and many, divided and not-divided, in the same Notion. (White 1665, 47)

²³White makes this point in *Peripateticall Institutions* (1656, 32).

According to White, a continuum is that which, necessarily, has its parts only potentially, not actually. This is because, if the parts were actual in a continuum—if they were both individual entities and parts of some continuous body—then the notion of continuum would entail a contradiction, given that it picks out one thing as both a unity and a multiplicity. This is salient for the issue of body because, for both White and Digby, a body just is ‘continuous’ quantity—that is what it is to be essentially quantitative and divisible into potential parts.

Again, far from *getting in the way* of some kind of corpuscularianism, potentialism is, for Digby and White, a veritable condition of possibility for coherent corpuscularianism. On this model, there is no problem of the cohesion of bodies, precisely because the model does not aim to ground bodies in the problematic cohesion of component parts. If parts are merely potential, then wholes, unities, or bodily substances are already given, and, on Digby and White’s view, corpuscularian physics can proceed without issue.

10.6 Margaret Cavendish on Digby on Potential Parts

Yet another reader of Digby and objector to his potentialism was Margaret Cavendish. Cavendish and Digby knew each other. We have a documented letter from Digby to Cavendish from 1657, and we know that Digby frequented William Cavendish’s intellectual circle. While it is indeed true that Cavendish does not engage explicitly with Digby’s work, as she does with Hobbes’ or More’s, it is likely that she had at least consulted some of Digby’s work. Moreover, the second edition of her *Physical and Philosophical Opinions* (1663, hereafter PPO) contains at least a couple of discussions that very closely track Digby’s own in the *Two Treatises*, including some brief reflections on potentialism about parts.²⁴

The opening paragraph of the very brief chapter, appropriately entitled, ‘Of Divisible, or Dividings’, makes extensive use of Digbean vocabulary. It reads like a direct commentary on Digby, or perhaps notes taken on his text (Cavendish 1663, 87). Her rebuttal is dense, and written in a somewhat less than accessible prose. Here it is in full:

in truth, it is beyond my capacity to understand, or at least my weak Faith to believe it [that parts are potential], for to my Capacity and Belief, the Parts are in the Whole, although undivided, and the Whole in the Parts, when divided, unless the Matter were Annihilated, and then there would be neither Whole nor Parts, but the Figures whole, Parts and Motions live or lie in the Substances, whether Divided or not Divided, neither is there any such thing as Individables in Nature, but as there are Infinite Divisions, so there are infinite Compositions, so that the Infinite Compositions do Equalize or make an Unity with Infinite Divisions, for one Infinite doth Counterpoise an other Infinite. (PPO 88–89)

²⁴Cavendish also seems to engage with Digby’s work in the chapter entitled ‘All Thought, and Senses, and Objects, are Substances’. There, Cavendish responds to Digbean claims about the relationship between our senses and an apple’s accidents. Cavendish’s discussion follows the structure of Digby’s, and echoes multiple words and phrases verbatim.

Cavendish packs three objections to potentialism into this passage: (a) commitment to potential parts presupposes confused notions of part and whole; (b) potentialism about parts entails an impossibility (annihilation); and (c) if any division necessarily entails a composition, as she takes it to, then a commitment to actual parts need not entail a commitment to indivisibles. Let's reconstruct how each of these objections is supposed to work, and how they relate to Digby's position.

Cavendish's first objection is that a potential part theory muddles the notions of part and whole. If something is a part, then, by definition, it has to be in a whole: it is a part only in so far as it is part of a whole. Similarly, a whole is a whole in virtue of the fact that it has a composition of parts.²⁵ Her second complaint is that Digby's theory entails annihilation, but annihilation is impossible in nature. In which case, potentialism entails an impossibility, and so it cannot be true. The issue is that the division of a whole into previously-non-actual parts means that the whole no longer exists: its division necessitates the annihilation of the whole. If cutting splits the whole into parts that were not previously there, then either something new (the parts) gets created in nature (in a strong metaphysical sense) or the whole, which previously existed, has now been annihilated. Perhaps because Digby's commitment to potential parts need not entail a strong notion of *creation*—the parts of a whole are already there potentially, Cavendish does not flag this implication, which would be equally impossible on her view. Her focus is instead on the latter implication—that the whole would be annihilated by its division. Such an annihilation of the whole does indeed seem to be an aspect of Digby's position, since he claims that, when parts are severed from a whole, that whole ceases to be (TT 10, 142). Cavendish takes this literally.²⁶ In Digby's potential part theory, on her reading, wholes are annihilated by division. Indeed, they must be annihilated because, for Digby, the whole must be something above the composition of the parts. Thus, the parts of a body cannot be potential parts. They must be actual parts, which 'live and lie' (Cavendish, PPO 88) in the whole: the parts are just as real as the body they are parts of.²⁷

²⁵The same point is also made by Hobbes in *De Corpore*. For instance, in the English translation, *The Elements of Philosophy*, which Cavendish had read, we see Hobbes claiming: 'nothing can rightly be called a Whole, that is not conceived to be compounded of Parts, and that it may be divided into Parts; so that if we deny that a thing has parts, we deny the same to be a whole' (Hobbes 1656, 71). Cavendish uses a similar argument in her *Observations upon Experimental Philosophy* (2001, e.g., 132, 194).

²⁶If the annihilated part ceases to be a part of that whole, then that whole must cease to exist. Only in this latter case would that which was formerly a part of a whole become a whole of its own. Perhaps the tacit assumption Cavendish operates with here is that a whole qua that whole and not another has (all of) its parts necessarily. Given that she allows for an identity between the whole and its parts—although they are two different metaphysical things in virtue of the fact that one is the ground for the other—it seems that she might be committed to something like this: any whole has its parts necessarily.

²⁷On the ontological status of parts in Cavendish's metaphysics, see Peterman 2019, Shaheen 2019, and Georgescu 2021.

Cavendish, then, argues for actualism about parts. But that exposes her to Digby's objection: actualism entails commitment to indivisibles. In her third objection, she opposes precisely this conclusion. Suppose, with Digby, that some continuous quantity—a piece of extension—is given. For its parts to be actual is for all parts that can possibly exist to actually exist. As discussed in the previous section, the further commitment that Digby appears to smuggle in for the actualist is that these actual parts have to exist as separate parts. Like Glanvill, Cavendish attacks the claim to separateness, but she does so for different reasons. Something that is not further divided, that actually exists, and exists separately, would, for Cavendish, have to be what she calls a 'single part', and,

it is impossible to have single parts in nature, that is, parts which are indivisible in themselves, as atoms; and may subsist single, or by themselves, precised or separated from all other parts. (Cavendish 2001, 126)

On her account, single parts are impossible in nature: any division necessarily entails a composition, such that no body is ever in isolation—if you cut a cake in two, you do not isolate a cake-half; rather, you divide one half from its composition with the other, but, in doing so, enter it into a new composition with, e.g., the air that is now between the halves. Cavendish takes Digby's argument against continuous quantity as made up of indivisibles to work precisely because it presupposes such single parts. To claim that to resolve a continuous quantity is to resolve it to indivisibles is to suppose that there are single parts that exist isolated from all other parts, and which somehow can be joined together into a continuous quantity. But if we reject the position that the foundational level is made up of such single parts, we can reasonably claim that the parts of a continuous quantity are actual.

This does mean, however, that each part is actual only if all the other parts are actual: since no part is single, everything is ultimately transitively in composition with everything, and any given part depends on all other parts for its existence. The stress test for this reading of Cavendish is again her view on annihilation. Recall that, according to Descartes, it is in the power of God to annihilate a part of matter; if God were to annihilate a piece of matter, the only (direct) consequence would be that the surrounding bodies would now come into contact. The important thing to note is that everything apart from the single annihilated piece of matter would preserve its actual existence. However, this is not the case for Cavendish. Her point is not that matter itself cannot be annihilated: it can be annihilated in just the same way as it can be created, i.e., in its entirety. What is not possible, on Cavendish's view, is for a single part of matter to be annihilated while preserving everything else intact. You get rid of one part, you get rid of them all.

I take it that she sees this not merely as a physical impossibility, but as a meta-physical one: God could not annihilate a single piece of matter either.²⁸ There are at

²⁸If one wants to claim that the annihilation of a part need not be in any relevant sense part of nature, but a miracle, it should be noted that Cavendish is particularly silent on whether and in what conditions God might perform miracles. It seems to me that Cavendish wants to place miracles outside of the domain of rational philosophical enterprise. If so, miracles cannot act as a constraint

least a couple of reasons for this: first, if God were to annihilate a single part at a given point in the history of matter, that act would constitute a violation of Cavendish's position that causal interaction between a material substance and an immaterial substance is impossible. Suppose, one might argue, that God is a special kind of immaterial substance. He, being omnipotent, is the exception to the causal closure principle. But, Cavendish explicitly denies that God *can* move matter (Cavendish 2001, 212). And that is because God's actions are only actions 'by decree': God cannot be the *agent* executing the decree (Cavendish 2001, 209). If God were to decree that a given piece of matter should go out of existence, the matter itself would have to do it. But now we have come back to the original prohibition against the annihilation of any piece of matter by natural means: matter cannot annihilate its own parts. Furthermore, Nature, for Cavendish, is infinite (in the maximal sense of being complete and containing all of, i.e., an infinite number of, its parts). If any part is annihilated, then Nature would cease to be infinite, because such an annihilation would introduce a limit to Nature (Cavendish 2001, 212, 236–37, 261–62). Accordingly, annihilation of any single piece of matter is metaphysically impossible.

Of Cavendish's three objections to potentialism, (a) holds no water for Digby: Cavendish claims that potentialism entails muddled notions of part and whole, but the claim rests entirely on maintaining differing definitions. To an actualist, potentialist definitions of part and whole will indeed look 'muddled', but the same holds vice versa. To pit one set of definitions against the other is more or less an exercise in futility. Her other two objections, however, while ultimately failing to undermine Digby's potentialism as it stands within his own system, are among the stronger explicit defences of actualism put forward by Digby's direct contemporaries. Cavendish makes a very cogent case for something like an actualist corpuscularianism—that is, she makes a cogent case for the co-implication of corpuscularianism and actualism that is generally assumed to be necessary. It is instructive, however, that she thinks that a system of this kind can only get off the ground if it is *not* mechanistic. In a non-trivial sense, then, Cavendish's position is the flipside of Digby's: she argues for an actualist corpuscularianism that is non-mechanistic, while he argues for a mechanistic corpuscularianism that is non-actualist. Both philosophies serve, from different angles, to undermine the intuition that corpuscularianism, mechanism, and actualism must go hand-in-hand.

to philosophical reasoning. On the performative role of allusions to miracles in her literary works, see Koster 2019.

10.7 Conclusion

Digby is, for good reasons, considered in the literature to be a mechanist. He was also, for equally good reasons, considered to be a corpuscularian by his contemporaries. He might not have used those particular terms himself, but we would be hard-pressed to claim they are inaccurate descriptions of his system. Intuitively, however they do not seem to sit well with his most fundamental commitment about bodies: we expect mechanism and corpuscularianism to explain a whole in terms of its parts, but Digby is adamant that the parts of a whole are only potential, and never actual—it would seem bizarre to attempt to reduce what is actually there (the whole) to what is actually not (the parts). Digby does not explicitly address the tension between these two aspects of his system in the *Two Treatises*, but the issue was not lost on his direct contemporaries. His potentialism was generally not well received, and his contemporaries offered critiques on explicitly actualist grounds. In this chapter, I have looked in detail at some of these critiques, and at Digby's, and White's, responses. By doing so, we can get a better idea of how something like a mechanist corpuscularianism is not, in fact, at odds with a commitment to potentialism about parts. Indeed, as it turns out, Digby's potentialism allows him to sidestep many of the issues that arise from the attempt to fuse actualism with corpuscularianism or mechanism. It may be somewhat counterintuitive, but it seems that his potentialism allows Digby to give an ultimately more robust mechanistic and corpuscularian picture of the natural world—more robust, that is, both than we might expect and, perhaps, even than his actualist opponents could muster. The exact machinery of this Digbean version of mechanism has yet to be worked out.

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