

Descartes and Individual Corporeal Substance

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Abstract (WORD COUNT: 98)

This essay explores the vexed issue of individual corporeal substance in Descartes's natural philosophy. Although Descartes often referred to individual material objects as separate substances, the constraints on his definitions of matter and substance would seem to favor the opposite view; namely, that there exists only one corporeal substance, the plenum. In contrast to this standard interpretation, however, it will be demonstrated that Descartes's hypotheses can provide a fairly convincing case for the existence of individual material substances; and the key to this new found individuation lies in a crucial set of passages from the *Principles of Philosophy*.

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If the duality of Cartesian mental and material substance has long been a source of contention among scholars, the precise nature of Descartes's notion of material substance *per se* has proven to be equally troubling. The difficulties mainly center upon the nature of individual corporeal substance, with its associated constellation of space-based concepts, such as internal and external place. Put simply, if a substance is defined as an independently existing entity, but a single part of extended substance requires the existence of its contiguous neighbors (given the matter-filled plenum) to delimit its surface, then in what sense is an individual corporeal part of the plenum *really independent*, and thus a substance? It would seem that all corporeal entities, or parts of extension/space, necessarily require the existence of all other corporeal individuals (or rest of extension/space). This conclusion, which seems to undermine the very possibility of an individual material substance, was much debated among the Cartesians (e.g., Cordemoy, Rohault, Spinoza),¹ and is still an essential topic in any investigation of Descartes's natural philosophy (e.g., Rodis-Lewis, Garber, Des Chene).²

Many commentators, finding the argument presented above rather persuasive, have reasoned that only the whole of Descartes's extended matter achieves the requisite independent status to qualify as a substance (such as, Keeling, Woolhouse, Anderson, to name only a few).³ In this essay, it will be argued that, contrary to the received opinion, a fairly plausible case can be made for individual corporeal substances in Descartes's plenum. The evidence for this conclusion is not only based on the specific details, and

implications, of Descartes's hypotheses, but also on his actual use of substance terminology as regards material objects. All in all, while not free from inconsistencies, the long-perplexing issue of individuation in Descartes's material world is both more coherent and successful than its many critics have charged.

1. The Problem of Individual Corporeal Substance.

Throughout his written work, Descartes often referred to individual material objects, such as a person's clothing, as substances: "a man who is dressed can be considered as compounded of man and clothes . . . although clothes are substances (AT VIII-2)." There are many other passages presenting a similar view: e.g., "the two halves of a portion of matter, no matter how small they may be, [are] two complete substances (AT III 477; see also, Pr II 11, 55, 60; AT VII 44, 222)."⁴ As for the definition of substance, in the *Principles of Philosophy*, he asserts that "by 'substance' we can understand nothing other than a thing whose existence is such that it needs no other thing in order to exist (Pr I 51)."⁵ This work also presents his well-known thesis that extension constitutes the essential property, or nature, of material substance ("extension in length, breadth, and depth constitutes the nature of corporeal substance . . ."; Pr I 53). As is often the case with Descartes's physical hypotheses, the exact nature of the relationship between extension and material substance is shrouded in uncertainty. Indeed, the language that Descartes uses to describe the relationship would seem to suggest that they are identical; i.e., that there is only a conceptual, and not real, distinction between the two (Pr II 8-12).⁶ The independence of extended substance from mental substance is, on the other hand, one aspect of Descartes's theory upon which all commentators find

agreement (see Pr I 54).

For our purposes, the problem with corporeal substance stems directly from Descartes's ideas on place, which also implicates his notions of body and motion. In the *Principles*, he states that motion is "*the transfer of one piece of matter or of one body, from the neighborhood of those bodies immediately contiguous to it and considered at rest, into the neighborhood of others. By one body, or one part of matter, I here understand everything which is simultaneously transported; . . . (Pr II 25).*" Thus, an individual "body" is defined by its containing, or common, surface with its contiguous neighboring bodies; where "by 'surface' we do not understand any part of the surrounding bodies, but only the boundary between the surrounding and surrounded bodies, . . . (Pr II 15; Descartes also deems this common surface, "external place")." The conceptual difficulties inherent in Cartesian space and motion are legion, needless to say (and beyond the bounds of this essay),⁷ yet these hypotheses raise relevant concerns about Descartes's penchant for referring to individual corporeal objects, like clothes, as substances. If, as noted above, a substance can exist independently of any other thing, then the direct dependence of a Cartesian body on its contiguous neighbors (to delimit its surface) apparently undermines its claim to substancehood. For later commentators (notably Spinoza and Leibniz, as quoted below), Descartes's analysis of the possibility of a vacuum, particularly a hypothetical scenario wherein God removed all the matter from within a vessel, became the focal point of these worries about the ontological status of individual material bodies:

If someone were to inquire as to what would occur if God removed the whole body contained in a vessel and did not allow anything to take the place of the body that had been removed, the answer must be that the sides of vessel would thus become contiguous to one another. For, when there is nothing between two

bodies, they must necessarily touch one another; . . . (Pr II 18).

On Descartes's estimation, a vacuum would be an empty space, or extension without matter, and is thus a contradiction in terms. So, removing the matter within a vessel is the same as removing its extension, with the inevitable outcome that the sides would now be contiguous.⁸

While some Cartesians dutifully followed Descartes's analysis of God-induced vacua, albeit with minor modifications, a number of natural philosophers found the implications of such hypothetical scenarios so unsettling that they were led to repudiate outright the very idea of an individual material substance. The thesis that advocates a non-individual corporeal substance, also known as "monism", is forcefully presented by Spinoza in the *Ethics*:

If corporeal substance could be so divided that its parts could be really distinct, why could not one part be annihilated, the rest remaining, as before, connected with one another? . . . For of things which are really distinct the one from the other, one can be and remain in its own position without the other. Since, therefore, it is supposed that there is no vacuum in Nature . . . , but that all parts must be united so that no vacuum can exist, it follows that they cannot be really separated, that is to say, that corporeal substance, . . . cannot be so divided (Part I, Prop. 15).⁹

The reference to the "really distinct" parts of matter (presumably) pertains to an argument put forth in Descartes's *Principles*; namely, that since the extended plenum can be divided by our minds into separate parts "clearly and distinctly," these parts must be really separate substances (Pr I 60; this passage will be discussed at length below). Spinoza reasons that, like the sides of the vessel, such parts are not really distinct or separated since they depend on their contiguous neighbors to retain their position (and thus lack the necessary independence to qualify as individual substances). Similar sentiments are voiced by Leibniz, who concludes: "In what is truly one substance there

are not many substances."¹⁰ Many present-day commentators have also favored the monist interpretation of Descartes's complicated material hypotheses. For instance, S. V. Keeling concluded that "a chair, a table, and a stone are not really, hence cannot be clearly understood to be, three separate extended *substances*. . . . They *really* are divisions within a single homogenous substance which is existent space (145)."

Most monistic theorists remain silent or, at the least, sketchy on the ontological status of individual material objects in their one extended substance. Presumably, Descartes's doctrine of bodily "modes", such as shape or motion, play the principal individuating role of in the homogenous plenum (where modes are the particular manifestations of bodily extension: e.g., the same volume of extension having either the mode of a circle or square; Pr I 64-65). For instance, M. Gueroult, one the chief proponents of this view, argues that among the variety of different modes of extension there are "modes properly speaking which alone merit this name in all respects, such as shapes or bodies, . . ."¹¹ If we conjoin the definition of "body" (and motion) in the *Principles* with the monist theory, the picture that begins to emerge is of a single, undivided plenum that nevertheless manifests a variety of migrating, individual geometric shapes (=bodies), much like the many ripples that move across a pond's surface. A similar view is often attributed to Spinoza, who is probably foremost among the Cartesians in advocating a material substance monism. For instance, on J. Bennett's reading of Spinoza (and possibly Descartes, too), individual bodies are regions of extension/space endowed with body-like attributes: "If there is . . . a pebble in a region R, what makes this true is the fact that R is *pebbly*, where 'pebbly' stands for a certain monadic property that a spatial region can have."¹²

T. Lennon, taking a more Malebranchian line, confines the individuating properties of bodies to the phenomenal realm, thus denying that there is any real motion or change in Descartes's one corporeal extension. Where Bennett conceives motion as neighboring spatial regions successively possessing a bodily property, Lennon maintains that "motion ontologically is the flow of sensations", much like "a shape distinguished from the visual field by a difference in color will move when qualitatively the same shape is distinguished in an adjacent area of the field by the same color."¹³ Despite its ingenuity, Lennon's Draconian interpretation of Cartesian bodily motion, to use his own appraisal (201), is conspicuously incompatible with Descartes's numerous references to motion as a mode of extension, and not, presumably, as a manner of perceiving extension. On this new reading, motion would be rendered more a mode of mind than body, apparently contradicting Descartes's insistence that "figure cannot be understood except in an extended thing, nor can motion, except in an extended space; nor can imagination, sensation, or will, except in a thinking substance (Pr I 53)." There is no textual evidence to support the claim that the mode of motion, as mentioned above, should be interpreted any different from the modes of sensation, willing, etc.; for they are both modes *in* their respective substances (i.e., motion in matter, and sensations in mind).

Although the sparsity of ontological and epistemological details associated with the monist theory remains an obstacle, the real difficulty with this view would seem to lie in its lack of textual support; for Descartes makes no overt references to individual material bodies as modes of a single extended substance. (In fact, one gets the distinct impression that most commentators are simply interpreting Cartesian metaphysics from a Spinozistic perspective.) There is one notable exception to this general lack of evidence,

however, and it is often invoked by monists to confirm their view. This passage, put forth in the Synopsis to the *Meditations*, is worth quoting in full:

Body, taken in the general sense, is a substance, But the human body, in so far as it differs from other bodies, is simply made up of a configuration of limbs and other accidents of this sort; whereas the human mind is not made up of any accidents in this way, but is a pure substance. For even if all the accidents of the mind change, so that it has different objects of the understanding and different desires and sensations, it does not on that account become a different mind; whereas a human body loses its identity merely as a result of a change in the shape of some of its parts.¹⁴

In commenting upon this passage, R. S. Woolhouse states:

The idea then seems to be that unlike human minds, human bodies (as also stones and horses) are not numerically different individual substances, but pieces of corporeal substance or body as such, in the way that pieces of lead are just that—pieces of lead, and not ‘leads’ [i.e., not different individual lead substances] (22).

Moreover, Woolhouse insists that the discussion (quoted above) from the *Meditations* “should be taken as Descartes’s considered view [of corporeal substance] (23).”

There are various difficulties with Woolhouse’s analysis, however. First, in order to accept his interpretation of the above passage, one must render the expression, “body, taken in the general sense,” into the phrase “body, taken as the entire plenum (or whole of extension),” since only this translation would seem to secure the desired monist outcome. Not only does this interpretation of Descartes’s wording strain credibility, but he must also deny that the intended meaning was the more plausible phrase, “body taken as any part of the plenum (or possibly the entire plenum)”, or, more simply, “body taken *generally*.” A truly faithful treatment of the term “generally” should allow for “any part of, or all extension”, rather than the more limited “all of extension”. Second, Woolhouse’s version of this quotation appears incompatible with Descartes’s further explication of the ontological status of the human body and mind, mainly as regards their

substancehood and identity. What Descartes seems to be stressing in this passage is that the nature of the human body, as a substance or unique entity, depends upon a distinct correlation of its numerous parts; a correlation of parts, moreover, that is not required for the substancehood of mind or of *any body* not possessing a complex internal structure—that is, not required of body taken *generally*. A human body, unlike any of its parts, is an interconnected whole whose very nature, or identity, depends on an elaborate structural arrangement of its parts (so that if you were to remove or rearrange these various constituent parts, it would no longer be the same body). In fact, the Cartesian hypothesis referred to by Woolhouse not only fails to undermine the substancehood of individual corporeal bodies, but Descartes’s further elaboration of this very issue (in the *Objections and Replies*) would seem to favor the cause of the anti-monists. For example:

Anyone who states that a man’s arm is a substance which is really distinct from the rest of his body does not thus deny that the arm belongs to the nature of the whole man. And saying that the arm belongs to the nature of the whole man does not bring about the suspicion that it cannot subsist in its own right (AT VII 228; see also AT VII 222).

Before turning to a defense of the non-monist version of corporeal substance, a few remarks are in order as regards the “modal” interpretation of Cartesian bodies, such as Gueroult’s theory (mentioned above). Quite simply, the most telling objection to this line of thought is its straightforward incompatibility with the extant discussions of Cartesian substance. In the *Principles*, which contains the most elaborate discussion of substances and their modes, all the specific examples of corporeal substance involve individual bodies (e.g., stones), and not the whole of extension: “If a stone is in motion and is square-shaped, I can understand the shape of the square apart from the motion and, oppositely, the motion without the shape of the square; but I cannot understand either the

motion or the shape apart from the stone's substance (Pr I 61)." The modal thesis likewise runs afoul of a section in the *Sixth Replies*, where Descartes insists that "the surface [of a body] is merely a mode and hence cannot be part of a body (AT VII 433)." That is, given his understanding of a surface as the boundary between the contained and containing bodies (Pr II 15, see above), Descartes feels confident to proclaim that "a body is a substance, and a mode cannot be a part of substance (AT VII 433)." Since a boundary does not form a part of a substance, it qualifies as a mode—unfortunately, the modes that comprise Gueroult's theory would not seem to satisfy this same criterion: if bodies are parts of matter (Pr II 25, as above), and bodies are also modes of the one corporeal substance, as the modal thesis advocates, then modes (=bodies) are parts of a substance.¹⁵

2. Countering the Monist Interpretation.

The monist case rests on the assumption that a substance, being an independent entity, cannot depend on another "thing" for its existence. On one reading of Spinoza's argument, it is the position (place) of the body relative to its neighbors that violates this, as we shall call it, "independence" clause. Yet, does this form of dependence, i.e., positional, really constitute a violation of Descartes's criterion of substancehood? If a part of the plenum were removed by God, thus resulting in a different arrangement of the surviving plenum inhabitants, it is true that the contingent status of the original positions of these parts would have been clearly demonstrated, but it is not at all obvious that their existence would have likewise been rendered dependent. (In addition, it should be noted that all Cartesian substance is dependent upon God; Pr I 51) If one were to apply Spinoza's reasoning scrupulously in all cases, it would seem to follow that *all substances*

would fail the independence test. For example, although the mind is a separate substance from the body, it depends on the body's sense organs for a large portion of its mental content; viz., sensory ideas of color, texture, taste, etc.. Note the symmetry in these two dependency cases: just as a given body depends on its neighbors for its bodily property of position, so the mind depends on its sense organs for its mental sense ideas.

Consequently, there would seem to be a defect in Spinoza's critique of individual corporeal substance: while some of the properties of a corporeal substance may be dependent, such as place, this does not necessarily undermine the object's independence as a distinct entity.

A monist would likely respond to this interpretation of Spinoza's argument by insisting that: (i) the intended target was not the property of position per se, but the very extent or boundary of an individual corporeal substance; which (ii) is a problem exclusively confined to material, and not mental, substance. In other words, the independence clause is violated since an individual material substance relies upon its contiguous neighborhood to provide its identity (via the containing surface). Without these contiguous neighbors, there would be no individual body, or plenum part. The same does not hold true for mental substance, however. Even if God were to eliminate all but one mind, the resulting state-of-affairs would not thereby invalidate the existence of the remaining mind. This is surely a persuasive interpretation of the monist critique (and possibly more what Leibniz had in mind), but notice that the emphasis would seem to have shifted away from the original "vessel" example. Rather than a "hole" in extension, as with the vessel thought experiment,¹⁶ a more troubling prospect for the non-monist would appear to be the opposite hypothetical case; i.e., a single material substance

surrounded by an empty, non-extended space. Without contiguous neighbors, what would provide the means of delimiting, or "marking off", the extension of the individual substance? Is an individual corporeal substance--which is essentially finite, bounded extension--even a coherent notion under these circumstances? This line of monistic criticism would seem to draw additional support from Descartes's rejection of the vacuum. In the *Principles*, he reasons that there can be no limit to extended substance, "for wherever we imagine those limits to be, we can always imagine not merely other indefinitely extended spaces beyond them, but also clearly understand that they are as we conceive them. . . ." (Pr II 21)

Nevertheless, even granting the strength of the monist position, the argument against individual corporeal substance does not necessarily go through. The monist case, as reconstructed above, relies on two key assumptions: (1) that an individual substance is delimited or defined by its contiguous neighbors (in order to secure the common surface); and (2) that space is necessarily "indefinitely" extended. From these Cartesian doctrines, the monist correctly concludes that not only is it impossible to remove any part of extension, but that such a removal would undermine the "contiguous neighborhood" means of delimiting individual substance. Yet, to decisively refute the non-monist, they need to prove an additional claim; namely, (3) that the lack of a contiguous neighborhood would eliminate or nullify the very existence of the extended material part previously bound by that neighborhood. Appealing to the factual impossibility of a vacuum cannot greatly assist the monist cause in pondering this hypothetical scenario, moreover. The main question concerns the following hypothetical, and not factual, case: If the contiguous neighborhood were annihilated, would it also nullify the existence of the

remaining portion of matter (previously contained within its common surface)? Now, it is not at all clear that this question can be provided an affirmative answer, let alone if it even has an answer--but that is the response, i.e., (3), that the monist must conclusively prove in order to refute the non-monist opponent. Put differently, while the contiguous neighborhood certainly defines the surface or extent of the contained material part, one cannot conclude from this form of dependency that the plenum part would cease to exist if that neighborhood were removed.

On the monist's behalf, it could be argued that a portion of matter without a containing surface (external place) is simply incoherent given the definitional parameters of Descartes's natural philosophy. Hence, all talk of existence is futile if a neighborless plenum part cannot be conceived. This objection carries a great deal of plausibility, especially provided Descartes's denial of the vacuum and his notion of clear and distinct ideas (Pr I 30). The non-monists have a few defensive strategies they can fall back upon, however. First, if the monist thesis ultimately amounts to the claim that "existence" cannot be predicated of a neighborless extended substance, then the existence of the *entire plenum* would be correspondingly threatened. Since it is "indefinitely" extended, the plenum *cannot* be enclosed within a contiguous neighborhood of containing bodies; and thus the monist would have to conclude that it, too, cannot exist.¹⁷ Now, the monist might contest this embarrassing outcome by invoking the fallacy of composition: in particular, it is not always true that what is required of the parts of a whole, or each external place, is also required of the whole, i.e., the plenum comprised of all external places. Whether or not the need for an external place transfers from the parts to the whole is an open question, of course, but it does raise doubts about the general plausibility of a

monist position that would deny existence to a neighborless, uncontained material substance.

The second reply to the alleged conceptual impossibility of a neighborless corporeal substance is based on an important passage in the *Principles*; a passage, furthermore, that constitutes the most powerful evidence in support of the non-monist. As noted above, Descartes stipulates that the parts of an extended substance which are separable in thought are really distinct, and thus are substances in their own right:

A Real [distinction] exists properly only between two or more substances: and we perceive these to be really distinct from each other from the single fact that we can clearly and distinctly understand one without the other. Since, knowing God, we know with certainty that he can accomplish whatever we understand distinctly. For instance, from the single fact that we have an idea of extended or corporeal substance . . . , we know with certainty that it can exist; and that if it does exist, each part of it which is capable of being delimited by our minds is really distinct from the other parts of the same substance. (Pr I 60)

Of crucial importance, here, is Descartes's claim that if we can distinctly understand "one [thing] without the other", then they really are distinct, independently existing substances. A part of extended substance can be distinctly separated, or delimited, from other parts in this same manner. Thus, Descartes affirms that each material part can be distinctly understood "without the other" parts, a conclusion which closely matches the "neighborless" interpretation of individual corporeal substance put forth above.

As a "real" distinction, moreover, the individuality of the plenum parts is grasped by the mind a priori. On this issue, D. Garber makes the important observation that the discussion of individual substance, in Pr I 60, is somewhat separate from the problem of individuation in the later *Principles* (176). As he explains, the key element in Cartesian physics, and not metaphysics, is motion. In Book II, as described above, a body or part of matter is definitionally bound to the concept of motion; yet motion has little, if anything,

to do with the type of thought-based individuation of substance prevalent in Book I. Garber's point concurs with our line of investigation, therefore, since the problem of the "empty vase", as well as the possibility of a neighborless individual substance (i.e., lacking a common surface), are conceptual, thought-based problems that do not involve motion (see, endnote 8). Unfortunately, Descartes occasionally confuses the issue by employing the term "body", which implicates motion, in his analysis of the empty vessel, which we have diagnosed as a purely space/plenum conceptual problem (not implicating motion). These confusions are probably inevitable, however, given the mere "conceptual distinction" between Cartesian space and body.

Of course, even if individual substances are delimited by thought alone, this does not forego the need for a contiguous neighborhood (or common surface, external place, etc.): it only means that the common surface separating an individual substance from the rest of extended substance is, likewise, a conceptual construct. Given the homogeneous expanse of extension, a person can imagine any number of "distinct" partitions of this substance into individual, independent elements (as will be discussed at greater length below). The conceptual nature of substance, as presented in Pr I 60, thereby makes the delimitation of individual substances relative to the conceiving individual, as Garber also notes (176). E. Grosholz finds this conceptual method of demarcation mysterious,¹⁸ but it is no more mysterious than, say, the Cartesian causal interaction of mind and body, two different substances without a common essence (Pr I 53)—consequently, the unintuitive connotations of a particular interpretation of Cartesian doctrine may not necessarily count against its accuracy in representing Descartes's intended view.

Returning to the monist challenge, it would seem that the ability to conceive

distinctly separate portions of matter, via Pr I 60, thus corresponds to our ability to conceive distinctly a plenum without limit. Yet, how can both of these statements be simultaneously true (namely, really independent parts but a real whole)? There is only one interpretive option that would seem to remain faithful to Descartes's (apparently contradictory) doctrines; viz., that if God were to annihilate all but one part of extension, the existence of that one remaining part would not be likewise annulled. The surviving plenum part would lack the contiguous neighborhood to materially delimit its surface, yet its existence could still be conceptually understood, or "delimited". This point is not easy to grasp, but an analogy with the concept of space, which is identical to extension and matter for Descartes (Pr II 9-12), may be of some assistance. Although space is conceived as a unity, with all its parts existing at once, the integrity of a single extended part of space would not appear to be compromised if one could (quite miraculously) annul the rest of space. Admittedly, the process by which space could be so removed is difficult to conceive, even granting the many historical precedents for just such a view.¹⁹ But, the very existence of the surviving portion of that space, and not necessarily its border or surface, is quite a bit easier to comprehend.²⁰

Put differently, distinctly conceiving the existence of an individual corporeal substance is not the same thing as distinctly conceiving its surface or boundary within the totality of extended substance--and this may be the conceptual distinction that Descartes was trying to make in simultaneously advancing both vacuum-less extension and individual corporeal substance. Some commentators have openly, and quite understandably, conflated these two issues. For instance, in critiquing Descartes's corporeal substance hypotheses, M. Grene states, "if we want to count bodies, they must

be clearly and distinctly separable So where is the 'distinctness'?"²¹ She appears to equate "distinctness" with the ability to "count them [i.e., corporeal substances], separating each by the space it occupies . . . (101)." Yet, Descartes is explicit in tying "distinctness" to our mental ability to "understand one without the other", which is not necessarily a process that differentiates bodies by *embedding* them in space. As argued above, if the annihilation of the rest of the plenum does not nullify the existence of the one surviving part, then the existence of that part has indeed passed the "one without the other" test of substancehood. This method of accounting for individual substance, moreover, does not appeal to a background spatial framework or a contiguous neighborhood to achieve its goal. It merely relies on the hypothetical case of an extension-less space, or vacuum. The fact that a vacuum is, in reality, an impossible state-of-affairs for Descartes does not detract from its use as a means of conceptually determining substancehood.

The problem for this construal of individual material substance is that it lacks support from subsidiary discussions of substancehood in the Cartesian corpus. Book I, Article 60 is apparently the only detailed explanation that would confirm the interpretation advanced above. Nevertheless, the ensuing portion of Pr I 60 compares the individuality of corporeal substances with the individuality of mental substances:

And, similarly, solely because every one understands himself as a thinking thing, and can by thought exclude himself from all other substance, whether thinking or extended; is certain that each one of us is really distinguished from every other thinking substance and extended substance (Pr I 60).

This passage provides crucial supporting evidence for the interpretation of Descartes's phrase "one without the other" assumed above, since thinking substance can, in fact, exist without material substance (as is well known from the *Meditations*). That is,

just as one portion of matter can be understood to be distinct from any other portion, so can a thinking substance be excluded, to use Descartes's term, from any other substance. Descartes would appear to be using such terms and phrases as, "distinct", "exclude", and "one without the other" interchangeably in these passages. And, as argued above, this seems to confirm the view that "individual" substances are ascertained by a conceptual process of excluding, removing, etc., all other things in order to determine if the original thing can still be coherently conceived. Attempting to imagine a neighborless plenum part may be difficult, but it may be no more difficult than trying to grasp dualistic causation; and many Cartesian commentators have been able to entertain this latter notion without undue apprehension.

In determining the more fundamental conceptual factors that may have prompted this view of material substance, suspicion would tend to fall upon the Cartesian notion of a "surface"; which, as explained above, is a common boundary that belongs neither to the contained or containing bodies. Its quasi-independent status is confirmed in the following excerpt from Descartes's explanation of the Eucharist:

The intermediate surface between the air and the bread is not different in reality from the surface of the bread, or from the surface of the air which touches the bread; in fact the three surfaces are a single thing that differ only in our thought. That is, if we call it the surface of the bread, we mean that even though the air which surrounds the bread has changed, the surface remains always numerically the same, given there is no change in the bread, . . . (AT IV 164).

In general, the common surface can remain the same despite a change in either the contained or containing bodies. For our purposes, the more important realization is that a body's surface is invariant under a change of containing bodies; that is, a different set of containing bodies can replace the original containing bodies without altering the common surface. Based on this insight, it is possible that Descartes may have drawn the inference-

-a rather problematic inference--that one could still meaningfully refer to a body and its surface without the existence of *any* containing bodies. Of course, the one remaining body would not possess a common surface in the literal sense (since there are no longer any containing bodies), but it would possess a sort of vestigial conceptual possibility of a common surface (or, pursuing a mathematical metaphor, it is the limiting case of a common surface as the existence of the containing bodies goes to zero).

3. Conclusion

All told, even if the explication of Descartes's natural philosophy advanced above remains somewhat troublesome, conceptually speaking, it has at least one other clear advantage over the monist interpretation: namely, it strives to accommodate the Cartesian doctrine of vacuum-less space *and* Descartes's numerous references to individual corporeal substance, which is a source of textual support not open to the monist. The monists have tried to render Descartes's natural philosophy palatable to their metaphysical intuitions. Correspondingly, they have interpreted the mutual interdependence of plenum parts as a violation of the tenet of Cartesian substance. Yet, as we have seen, the monist's understanding of these issues is not Descartes's, and thus the exact nature of his complex definitional distinctions warrants an analysis more faithful to the Cartesian texts.²²

¹ G. de Cordemoy, *Oeuvres philosophiques*. P. Clair and F. Girbal, eds. (Paris: Presses Universitaires de France, 1968), 103-104; J. Rohault, *A System of Natural Philosophy*, vol. 1 (written 1671), trans. J. Clarke and S. Clarke (1723), (New York: Johnson Reprint Corp., 1969), 28; B. Spinoza, *Ethics*, Part I, Prop. 15., Demonstration, in *Spinoza Opera*, ed. by G. Gerhardt (Heidelberg: C. Winter, 1925).

² G. (Rodis-)Lewis, *L'individualité selon Descartes*. (Paris: J. Vrin, 1950), 45-57; D. Garber, *Descartes' Metaphysical Physics*. (Chicago: U. of Chicago Press, 1992) 175-176; D. Des Chene, *Physiologia: Natural Philosophy in Late Aristotelian and Cartesian Thought*. (Ithaca: Cornell University Press, 1996), 367-377.

³ S. V. Keeling, *Descartes*, 2nd ed. (Oxford: Oxford U. Press, 1968), 145; R. S. Woolhouse, *Descartes, Spinoza, Leibniz: The Concept of Substance in Seventeenth Century Metaphysics*. (London: Routledge, 1993), 22-23, 55; W. E. Anderson, "Cartesian Motion", in *Motion and Time, Space and Matter: Interrelations in the History and Philosophy of Science*, ed. by P. K. Machamer and R. G. Turnbull. (Columbus: Ohio State University Press, 1976), 202; G. Rodis-Lewis, *L'oeuvre de Descartes*. (Paris: J. Vrin, 1971), 548; D. Marshall, jr., *Prinzipien der Descartes: Exegese*. (Freiburg: Verlag Karl Alber, 1979), 54-57. Listing all the commentators who accept the monist position, or at least find the notion of individual corporeal substance untenable, would take up nearly the entire length of this essay.

⁴ Translations from the *Principles of Philosophy* are based on the edition by V. R. Miller and R. P. Miller (Dordrecht: Kluwer Academic Publishers, 1983), but are checked against the C. Adam and P. Tannery edition of the *Oeuvres de Descartes* (Paris: J. Vrin, 1974). I will identify passages according to the standard convention: thus, Article 15, Part II, of the *Principles* will be labeled "Pr II 15." Passages from the French translation of 1647 will be prefaced by "Fr". Other translations that are based on the complete Adam and Tannery edition will be marked, "AT", followed by volume and page number.

⁵ It should be noted that Descartes's definition of substance, as "independence from other substances", does not exactly correlate with substance as understood by many of the Scholastics, who often held a much more elaborate notion (e.g., Toletus). On this topic, see, D. Des Chene 1996, chap. 3.

⁶ As G. Brown has argued, nevertheless, it may not be necessary to read the intimate correlation between extension and matter as a straightforward identity claim; "Mathematics, Physics, and Corporeal Substance in Descartes", *Pacific Philosophical Quarterly*, 70 (1989), 281-302. This issue will be raised briefly below, although the identity of extension and matter, or lack thereof, will not affect the main arguments of this essay.

⁷ For an analysis of some of these problems, see, E. Slowik, "Descartes, Space-Time, and Relational Motion", *Philosophy of Science*, vol. 66, no. 1, 1999, 117-139.

⁸ In his correspondence on this thought experiment, Descartes makes it clear that the removal of the body in the vessel results in the sides becoming "immediately" contiguous, but that there is no motion involved in this process (which would imply the contradictory state of affairs, for Descartes, of the sides moving into the empty space left behind). See, AT IV 109, AT II 482. Some commentators have failed to recognize this crucial distinction, and have accordingly posited motion to the sides of the vessel after the removal of the body: for example, J. Rohault, *ibid.*, vol. 1, 28; and M. Jammer, *Concepts of Space*, 2nd ed. (Cambridge, MA: Harvard U. Press, 1969), 43-44.

⁹ Spinoza is not a straight-forward Cartesian, of course, since many of his own ideas differ quite drastically from Descartes's (especially on the metaphysical problem of dualism). Yet, their respective ideas concerning natural philosophy are similar enough to justify the general label.

¹⁰ G. W. Leibniz, "Letter to De Volder, May 13, 1699", in *G. W. Leibniz: Philosophical Papers and Letters*, trans. and ed. by L. E. Loemker. (Dordrecht: D. Reidel, 1970), 519.

¹¹ M. Gueroult, "The Metaphysics and Physics of Force in Descartes", in *Descartes: Philosophy, Mathematics, and Physics*, S. Gaukroger, ed. (Harvester Press: Sussex, 1980) 199. Gueroult's full presentation of his argument appears in *Descartes' Philosophy Interpreted According to the Order of Reasons, Vol. II*, trans. By R. Ariew (Minneapolis: U. of Minnesota Press), 63-74.

¹² J. Bennett, "Spinoza's Metaphysics", in *The Cambridge Companion to Spinoza*, ed., D. Garrett. (Cambridge: Cambridge U. Press, 1996), 70-71. Interestingly, Bennett's interpretation, which he dubs a

"field" theory, is much in the spirit of later "supersubstantialist" theories of space (i.e., where space is the only predicable substance; and thus objects are merely qualitatively/quantitatively distinct portions of space). Newton toyed with this idea in his early essay, *De Gravitatione et aequipondio fluidorum*, trans. and eds. A. R. Hall and M. B. Hall, in *Unpublished Scientific Papers of Isaac Newton*. (Cambridge: Cambridge U. Press, 1962), 139.

13 T. M. Lennon, *The Battle of the Gods and Giants: The Legacy of Descartes and Gassendi*. (Princeton: Princeton University Press, 1993), 204-205.

14 AT VII 14. This translation is from *The Philosophical Writings of Descartes, Vol. II*, trans. and ed. By J. Cottingham, R. Stoothoff, and D. Murdoch (Cambridge: Cambridge U. Press, 1984), 10.

15 This problem with the modal thesis is raised by P. Hoffman, "The Unity of Descartes's Man", reprinted in *The Rationalists*, ed. by D. Pereboom (Lanham: Rowman & Littlefield, 1999), 64.

16 Ironically, Descartes's "empty vessel" argument can be seen as an early forerunner to the "hole" problem that plagued Einstein's development of General Relativity, as well as recent formulations of substantialist space-time theories. See, J. Earman, *World Enough and Space-Time*. (Cambridge, MA: MIT Press, 1989), chap. 9.

17 E. Grosholz raises related difficulties, stressing that Descartes's arguments against the vacuum can only work for finite, bounded vacua, and not necessarily against a vacuum that surrounds the material world: "Descartes and the Individuation of Physical Objects", in *Individuation and Identity in Early Modern Philosophy*, ed. by K. F. Barber and J. J. E. Gracia (Albany: State U. of New York Press, 1994) 48-53. Also, Descartes's term "indefinite" essentially functions as "infinite", since it stands for a concept of which no limit can be conceived. Only God, however, is the proper subject of the "positive"-sounding designation, "infinite", which lacks any sense of limit (Pr I 26-27).

18 E. Grosholz, *Cartesian Method and the Problem of Reduction*. (Oxford: Clarendon Press, 1991), 68.

19 There were many sixteenth and seventeenth century Natural philosophers who did accept a theory with similar implications, such as F. Suarez, P. Fonseca, the Coimbra Jesuits, B. Amicus, and E. Maignan. These thinkers tried to accommodate both the notion of a finite extended world and an infinite (quasi-) non-extended void: i.e., an "imaginary" space that, while not possessing extension or dimensionality, had the capacity to receive extended bodies. Descartes's theory of space rules out this option, for he interprets vacuum as an extended "nothing", which is an impossible state-of-affairs (since "nothing" cannot be the subject of a property). Thus the actual existence of a plenum is impossible since extension must be a property of some thing (but this should not be taken to undermine the argument centered upon conceivability that will be advanced below). (Pr II 16) His substance-property dichotomy is clearly at work, here. (see, Pr I 56) On "imaginary" space theorists, see, E. Grant, *Much Ado About Nothing: Theories of Space and Vacuum from the Middle Ages to the Scientific Revolution*. (Cambridge: Cambridge U. Press, 1981), chap. 7.

20 R. Florka has suggested to me that a better interpretation of the consequences of removing all of the space surrounding a body is that it would now fill all of extension: i.e., the body, say, a chair, would now assume the role of the "indefinitely" extended plenum, which is a better analogue to the case of the empty vessel, as examined above. Of course, the problem that would now arise is whether or not the object retains its identity after it becomes indefinite extension; since, if it is indefinitely extended, and thus has no boundary, in what sense can it still be referred to as a "chair"? Overall, both versions of individual material substance, i.e., Florka's and my own, face the difficulty of coherently explaining the boundary, or surface, of these substances given their lack of contiguous neighbors, thus both approaches to this problem can be seen as complimentary. R. Florka, "Comments on Slowik's 'Descartes, Monism, and Individual Corporeal Substance'", presented at the American Philosophical Association Central Division Meeting, May 8, 1999.

21 M. Grene, *Descartes*. (Minneapolis: U. of Minnesota Press, 1985) 100-101.

²² I would like to thank Calvin Normore, Jonathan Bennett, R. Florka, Andrew Black, and an anonymous referee from the *British Journal for the History of Philosophy*, for their helpful comments and discussions which contributed greatly to the formulation of this paper.