Locke's Essay is like a mail-order catalogue," writes P. T. Geach, "and you buy what suits you. To switch to a communication-theory metaphor, the trouble is to make out which part is message and which is noise."1 Something similar might be said of the Leibnizian corpus. It is large and diverse and rich—so rich that there are within it tensions or outright contradictions. These force the commentator to choose which items to purchase and which to let well alone. Message and noise are alarmingly often set side by side in texts from the same or closely neighboring periods of time, in different drafts of the same essay, and sometimes in the very same draft.

When one turns to Leibniz's views of matter, one is confronted with an astonishing collection of distinct accounts. One must adopt either (i) the so-called "Athenian" approach, drumming out all of the incompatibility and presenting a single overarching inclusive account, or else (ii) the "Darwinian" strategy, saying his views of

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matter changed significantly during his lifetime. Though the Darwinian view applies to some of his doctrines—for example, his views of space and time—it does not apply to his metaphysics of matter. Instead of running a single doctrine of body through many mutations and emerging with a completely new doctrine, Leibniz allows several doctrines to coexist and flourish together.

The views are scattered throughout the mature corpus, but I will note the date of texts I cite because their interpretation is affected crucially by the nature of other doctrines Leibniz held at that time. I will follow Leibniz in using ‘body’ as the most general term designating material objects. But I will somewhat diverge from his usage of the term ‘phenomenon’ and its cognates. Leibniz tends to use this as a specific, pejorative label for such ontologically lightweight items as illusions and aggregates of substances. I will argue that a more general meaning that Leibniz sometimes attaches to the concept of phenomena is useful as a way of characterizing his overall doctrine of body.

At the outset let us set forth a picture of Leibniz’s overall system. From the perspective of perceiving substances (“monads” or “corporeal substances”), there are four possible objects of perception:

1. **illusions**: mere appearances that fail to cohere with other objects of perception.
2. **aggregates**: appearances that are misleadingly unified—they actually are collections of an infinite number of substances.
3. **corporeal substances**: combinations of specially-organized groups of monads/corporeal substances (forming the “organic body”) and a perfect-unity-bestowing “dominant monad.”
4. **substantially bonded corporeal substances**: corporeal substances that have added to them a “substantial bond” that makes them perfectly continuous.

(4) is not supported widely in the corpus, and (1) does not play a great role in the Leibnizian program. Thus I shall concentrate mainly on (2) and (3).

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In the first section I clarify Leibniz's use of 'phenomenon'. The second section is devoted to setting forth the accounts that highlight perceptual features as the nature of body. I explore mereological accounts in the third section, followed by a supervenience construal. Finally, I combine several of the accounts to derive various versions of Leibniz's sufficient conditions for body. For most of these accounts I will ask: What conditions must obtain in order for there to be (i) a body at a time, and (ii) a body that endures for a period of time? More familiar and accessible passages will typically be quoted only briefly, less familiar passages more fully.

1. 'Phenomenon'

In a seminal letter of 1687 to Arnauld, Leibniz uses 'phenomena' to refer to illusions and aggregates. He says that if matter lacked "true unity," it would be "a phenomenon, lacking all reality as would a coherent dream" (G 2:99/LA 122). Of aggregates he writes that though there are various "degrees of accidental unity," such unities "are made complete only by thoughts and appearances, like colors and other phenomena . . ." (G 2:100/LA 126). How does the mind dole out unity?

Our mind notices or conceives of certain genuine substances which have various modes; these modes embrace relationships with other substances, from which the mind takes the opportunity to link them together in thought and to enter into the account one name for all these things together, which makes for convenience in reasoning. (G 2:101/LA 126; cf. G 2:97/LA 121; G 2:119/LA 153)

There are two senses of 'phenomenon' here, both metaphysically pejorative. Either

\textit{ILL}: x is a phenomenon = x is an illusory appearance,

which makes it quite ontologically flimsy; or

\textit{MEN}: x is a phenomenon = x is the appearance of an aggregate of corporeal substances or monads whose unity is only apparent, since it is manufactured by the mind,
which makes it a bit less flimsy but nevertheless far from fundamental since its unity is not genuine. We can call bodies corresponding to *ILL illusory phenomena*, and those corresponding to *MEN mental phenomena*.

Illusory phenomena are ontologically negligible, since they are nothing over and above appearances in minds. Mental phenomena belong to a higher caste, since there is something extra-mental—aggregates of substances—that they represent.

In *MEN* I've allowed those aggregates to be composed of either corporeal substances or monads. Why? Because Leibniz allows for the disjunction. In the Arnauld correspondence and elsewhere the constituents are called "corporeal substances," "animals," or "living bodies" and are clearly thought of as the constituents of phenomenal aggregates (G 2:120/LA 154). Each corporeal substance is composed of a dominant monad plus an "organic body" or "machine." Organic bodies are best thought of as fancy aggregates—typically collections of organs—that are specially suited to the role of acting as the body of a corporeal substance after that organic body has been joined to a dominant monad. Frankenstein's "monster body" before it came to life would be an example of an organic body. Like ordinary aggregates, the organic body—which in the Arnauld exchange Leibniz calls the "body apart, without the soul" (G 2:100/LA 125) or "the mass of [a person's] body" (G 2:120/LA 154)—is said to be composed of other smaller corporeal substances. Leibniz maintained this position throughout the mature period, as is clear from his remark in 1699: "... corporeal substance has its mass or its secondary matter, which is, again, an aggregate of other smaller corporeal substances—and that goes to infinity" (G 3:260/AG 289; cf. G 7:501–2; G 2:205; G 4:572–73; G 6:550).

But elsewhere Leibniz says *monads* make up aggregates and the organic bodies of corporeal substances. In a letter of 1705 to Princess Sophia he says "... nothing prevents matter from being composed of simple and indivisible substances" (G 7:561), adding in a treatise of 1712,

A substance is either simple, such as a soul, which has no parts, or it is composite, such as an animal, which consists of a soul and an organic body. But an organic body, like every other body, is merely an aggregate of animals or... of small objects or masses; but these also are finally resolved into living things, from which it is evident that all bodies are finally resolved into living things, and that what, in the
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analysis of substances, exist ultimately are simple substances—namely, souls . . . or . . . monads, which are without parts. (C 13–14/P 175; cf. G 6:598–99/P 196; G 2:282/L 539; G 3:367)

Here, rather than finding corporeal substances “all the way down,” those substances themselves are further analyzed into “ultimate” constituent monads.

Though they are more ontologically weighty than illusory phenomena, mental phenomena remain somewhat metaphysically inferior because the aggregates they represent are mostly misrepresented. In particular, mental phenomena seem to be unified, but that unity isn’t genuine. Often it is said to be the mind’s sensory side that is responsible for rounding up so many distinct things—say, many water droplets—and considering them as one thing—a rainbow (G 2:119/LA 153; cf. G 7:563). Leibniz held that sometimes—as in the case of a pile of rocks—we see the aggregate for what it is: a mere heap. But at other times the mind is at least momentarily tricked into accepting aggregates as real unities because the senses smear out the divisions between their parts (G 2:100–101/LA 126–27).

The senses get blamed for erroneously attributing not only unity but also secondary qualities and continuity to aggregates. In the case of a rainbow, the aggregate appears colored because the senses portray millions of colorless droplets as an arched color patch. Leibniz holds that color and other secondary qualities mislead us as to the true nature of the object: they are merely “apparent” and “relative to our senses.”4 (We will hereafter use ‘color’ as a brief way of referring to all of the secondary qualities.) Finally, Leibniz ties the apparent continuity of bodies to the senses. In 1705, when discussing the difference between truly continuous “ideal” items (like space, time, and “mathematical bodies”) and real, discontinuous material bodies, he explicitly blames the senses for running the parts of the aggregate together so as to make the collection appear to be a seamless, continuous whole:

There are therefore always actual divisions and variations in the masses of existing bodies, to whatever degree of smallness one might go. It is our imperfection and the fault of our senses that makes us

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conceive physical things as mathematical beings, where there is some indeterminacy. . . . (G 7:563)

Matter appears to us to be a continuum, but it only appears so, just as does actual motion. It is rather . . . as a spoked wheel appears continuously translucent when it turns with great speed—without which one could tell the location where the spokes are from the empty spaces in between the spokes—our perception running together the separate places and times. (G 7:564)

A century ago J. E. Erdmann got this point about continuity abundantly right:

[A] combination of non-extended simple substances becomes extended through our perception of it, which is confused. We see the milky way or a cloud of dust as continua, because our eye is not sharp enough to distinguish clearly the individual stars or particles of dust.5

At the moment we'll concentrate on the unity of mental phenomena, and bring in color and continuity later in our comprehensive perceptual construal of aggregates.

MEN's theme of the mind's taking many things and making one thing out of them is quite different from another point that Leibniz makes in many of these same passages—namely,

**DER:** \(x\) is a phenomenon = \(x\) is an aggregate of corporeal substances or monads whose reality is completely derived from that of its constituents.

Phenomena corresponding to **DER** will be called **derivative phenomena**.

**DER**'s theme of an aggregate deriving its reality from its constituents is clearly set forth in the Arnauld correspondence:

\[\text{[E]very entity through aggregation presupposes entities endowed with a true unity, because it obtains its reality from nowhere but that of its constituents, so that it will have no reality at all if each constituent entity is still an entity through aggregation. . . . [I]f there are aggregates of substances, there must also be genuine substances from which}\]

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all the aggregates result. (G 2:96/LA 120; cf. G 2:100/LA 125; G 2:261; G 2:267)

Derivative phenomena are, like mental phenomena, aggregates. The difference is this: mental phenomena are only apparently unified; derivative phenomena are only apparently real. For example, a piece of sandstone seems to have a reality of its own, but on reflection it is clear that it owes its reality completely to its constituent sand particles.

Leibniz himself blurs the border between mental and derivative phenomena by presenting them merely as alternative ways of expressing the same point, as he does here when addressing De Volder in 1704: “Whatever things are aggregates of many are not one except for the mind, nor have any other reality than what is borrowed, or what belongs to the things of which they are compounded” (G 2:261/R 249). Thus I’ll offer one construal according to which mental and derivative phenomena are given the very same metaphysical analysis.

On the whole, however, I want to suggest that we not follow Leibniz in this. The concepts involved in MEN are strikingly different from those in DER: certainly there is more than a slight shift of idiom here. Mental phenomena are put together by the mind: that has a much more Kantian flavor than the mereological/metaphysical analysis suggested for derivative phenomena. Mental phenomena are thought of as real because of something going on “in the head”; derivative phenomena seem real because of the reality emanating forth “outside the head” from their metaphysically more basic parts. One reason for putting asunder what Leibniz has joined together is that there is little textual evidence explicitly linking the unity-making tendency of the mind with a reality-attributing function of the mind: the unity is typically said to come from the mind, the reality from the parts. Thus I shall quickly pull them apart in the analyses that follow the one mentioned.

There is a fourth sense of ‘phenomena’ I want to attribute to Leibniz. Actually, it is best seen as a sense of ‘phenomenal’, because it doesn’t refer to appearances in minds. Instead, it refers to a general ontological level in his overarching scheme:

LEV: \( x \) is phenomenal = \( x \) belongs on the middle ontological level of Leibniz’s metaphysical scheme.
A detailed argument in favor of attributing to him a three-level ontology has already been presented elsewhere. Very briefly, one finds that after 1695 Leibniz endorsed a fundamental level where the monads and their states reside; just above that he has bodies, derivative force, motion, extension, and duration at the phenomenal level; and finally at the top he has the items that are furthest from being taken seriously ontologically. These include space, time, and "mathematical bodies," which are consigned to the ideal level. In this scheme, 'phenomenal' is a term that simply calls attention to the general fact that the item in question belongs on the middle phenomenal level in that scheme.

Where does Leibniz use 'phenomenal' to indicate a level? I think it is visible in the following passages. In Specimen Dynamicum of 1695 he writes, "[M]otion insofar as it is phenomenal consists in a mere relationship. . . . For even though force is something real and absolute, motion belongs to the class of relative phenomena, and truth is found not so much in phenomena as in their causes" (GM 6:247–48/L 445–46). He is using the phrase a 'class of relative phenomena' to pick out a group of items that includes bodies, force, motion, the extension of bodies, and duration. A decade later he writes, "I relegate derivative forces to the phenomena. . . . I also put corporeal forces where I put bodies, namely, among the phenomena" (G 2:275–76/AG 181–82). Once again "the phenomena" represents a place to put various items—it is a category or a level.

'Phenomenal' in this "levels-sense" will always be used as an adjective. The noun 'phenomenon' invites us to think of an item as a sense datum or an appearance in a mind. The illusory mirage-phenomenon and the mental or derivative genuine-oasis-phenomenon might be construed as sense data. (On the typical analysis, they would both be images in the mind, with the illusory/genuine distinction explained by reference to the difference between a dehydrated, exhausted perceiver far from any oasis and a "normal" perceiver near one.) But Leibniz says motion and force belong "among the phenomena," clearly thinking that they exist.

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outside the mind. There is no esse is percipi doctrine in the Leibnizian corpus. Thus, though force and motion aren’t phenomena, they’re phenomenal—in the levels-sense. In Leibniz’s ontology all the phenomena—illusory, mental, and derivative—as well as such features as motion and force, are on the phenomenal level.

What is the nature of items on this level? The ordinary connotations of ‘phenomenal’ invite us to furnish it with fleeting sense data. But with the exception of illusory phenomena, that would be a mistake. What Leibniz says about mental and derivative phenomenon clearly favors Robert M. Adams’s view (expressed in private correspondence) that the world “as it appears to us at any instant has a history much longer than that instant.” This “history of the world” is distinct from the history of the mind which is being appeared to, and so nonillusory items on the phenomenal level are in some sense external to the mind. But they are not to be construed as unperceivable material substrata or Kantian “things-in-themselves.” They are relatively stable and enduring items in what we will call the phenomenal world.

In this phenomenal world are two very different kinds of items: (i) corporeal substances like giraffes and humans; and, at least apparently (ii) aggregates (or “well-founded phenomena”) like piles of rocks (G 7:501). When you look at your hand, you are looking at a corporeal substance—in this case (part of) an organic body whose constituent substances are attached to your soul—the dominant monad. Should that hand be amputated, it would immediately become a “well-founded phenomenon,” a mere aggregate.

2. Perceptual Phenomenalisms

Perceptual phenomenalisms construe bodies as appearances in minds. We are going to follow Leibniz in leaving open the possibility that nonillusory bodies are more than mere appearances—that they are extra-mental collections of substances in the phenomenal world. In later sections we’ll explore the extra-mental nature of body. Here we’ll just be listing necessary conditions relating to perception.

For the moment we’ll leave aside mental and derivative phenomena: they’ll be analyzed in the final perceptual account below. What we need to deal with first are illusory phenomena as contrasted
with what Leibniz calls in a famous paper of 1686 real phenomena (G 7:319–22/L 363–65; cf. G 2:270/AG 181; G 2:276/AG 182). He says that phenomena are to be judged illusory or real according to certain internal and external marks.

The internal marks (that is, those purely internal to the perceiver’s own experience) are Berkeleysque: they include vividness, complexity, intensity, and internal coherence. I will refer summarily to these by describing real phenomena as ones that “cohere well with other phenomenal features of a person’s experience.” The main external sign refers to other perceivers. Once again this is a coherence condition, explained as requiring of a real phenomenon “a consensus with the whole sequence of life, especially if many others affirm the same thing to be coherent with their phenomena also” (cf. G 3:622). Real phenomena that meet that condition will be said to “cohere well with other items in the phenomenal world.”

Finally, a person must be able to predict future phenomena on the basis of her experience of the real ones (G 7:320/L 364). On the internal account this takes the form of requiring that real phenomena be usable as guides to anticipating one’s own future experiences. In the external story it would require that one’s predictions are very often borne out by and cohere well with one’s own as well as others’ experience of the phenomenal world.

Since there is no need to pursue persistence conditions for illusory phenomena, we need not present a diachronic account. The synchronic account will specify necessary and sufficient conditions, since it is unlikely that Leibniz thought there were any further conditions that had to hold “outside the head” in order for illusions to exist. In the following accounts \( x \) ranges over all objects, \( t \) over all times,\(^7 \) \( P \) over all finite (human and nonhuman) perceivers, \( s \) over all perceptual states, and \( \{S\} \) is the set \( \{s_1, s_2, \ldots, s_n\} \) of states assigned to \( P \) by God at creation. \( \{S\} \) is the embodiment of \( P \)’s

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\(^7\)References to times are innocuous so long as we don’t think that ‘time’ refers to some Newtonian absolute item that is metaphysically basic. Leibniz holds that time itself is a mere abstract, perfectly continuous conceptual grid in the ideal realm. He allows discrete duration, however, to characterize bodies at the phenomenal level, and it seems he also must allow duration to characterize persisting monads (though he doesn’t explicitly acknowledge this). Thus I’ll freely help myself to discrete times as ways of measuring spans of, and marking off points in the course of, a body’s duration.
complete concept in the form of a "law of the series" (G 2:262/L 533; G 4:512/L 504), according to which the unfolding of $P$'s perceptual states must follow a specific, determinate causal order.\(^8\) Leibniz says those states are characterized by perception and appetite, using the appetitive side of the state to account for $P$'s striving to reach its next state. I'll streamline this by referring to these perceptual/appetitive states as "perceptual states." We'll call the perceptual account of illusions $P$-ILL.

$$P$-ILL: x is an illusory phenomenon at $t$ iff: at $t$ there is some $P$ that is in some $si \in \{S\}$ such that: $si$'s representational content includes an extended appearance, $x$, that fails to cohere well with (i) other phenomenal features of $P$'s experience and (ii) other items in the phenomenal world, assuming mechanistic laws.

Here "representational content" is meant to contrast with the Cartesian "formal content" of mental states, and to pick out its intentional content—that is, what the state is of or about.\(^9\) In connection with $P$-ILL (and $P$-REAL, which follows), I am eliminating from consideration the cases where $si$'s representational content includes bodies that are perceived unconsciously. In our central text, Leibniz is considering only cases where the subject is consciously judging objects to be real or imaginary. 'Phenomenal features' refers to any aspect of the perceptual content of $P$'s mind. Mechanistic laws are meant to rule out idiosyncratic perception. They hold between bodies construed both as features of $S$'s experience (thus assuring well-behaved sense data) and as more full-blooded denizens of the phenomenal world (well-behaved physical objects).

Next are nonillusory bodies, or real phenomena. To the synchronic analysis we here add a diachronic account, but specify only necessary conditions for the perceptual account of real phenomena, $P$-REAL:

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\(^8\)See R. C. Sleigh, Jr., *Leibniz and Arnauld: A Commentary on Their Correspondence* (New Haven: Yale University Press, 1990), 128–30, on the notion of "real causation" in a substance.

\(^9\)The formal content would express the representational content and contain nonrepresentational appetitive and perceptual features as well. I don't bring it in explicitly here because only representational features are crucial in spelling out the perceptual account of body.
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\(P\text{-REAL: } x\) is a real phenomenon at \(t\) only if: at \(t\) there is some \(P\) that is in some \(si \in \{S\}\) such that: \(si\)'s representational content includes an extended appearance, \(x\), that coheres well with (i) other phenomenal features of \(P\)'s experience and (ii) other items in the phenomenal world, assuming mechanistic laws.

\(x\) is a real phenomenon that persists from \(t_1\) to \(t_n\) only if: at each \(t_i\) between \(t_1\) and \(t_n\), some \(P_1\) is in some \(si \in \{S_1\}\) such that: the representational content of each \(si\) includes an extended appearance, \(x\), that coheres well with (i) other phenomenal features of \(P_1\)'s experience and (ii) other items in the phenomenal world, assuming mechanistic laws.

In the diachronic version of \(P\text{-REAL}\), we must require that a particular \(P\) (\(P_1\) here) be the one that is in the various perceptual states. \(P_1\)'s set of career perceptual states is thus dubbed "\(\{S_1\}\)." \(x\)'s duration is underwritten by both internal and external conditions. From the inside perspective, \(x\) persists in virtue of the continuity of \(P_1\)'s experience of \(x\). The external condition requires that \(P_1\)'s experience of \(x\) be confirmable by that of other perceivers of the public phenomenal world.

Leibniz apparently was not satisfied with these two analyses. They seem to combine Berkeleyan "inside the head" conditions with some very non-Berkeleyan but nevertheless vague requirements for something to obtain "outside the head." Recall that in response to Berkeley's "paradoxical" doctrines he wrote: "[W]e have no need to say that matter is nothing, but it suffices to say that it is a phenomenon like the rainbow; and that it is not a substance, but a result of substances."\(^{10}\) He chides Berkeley for not going further than simply saying that the true substances are "Monads, or Perceivers"—Berkeley should have seen that there are "infinite Monads, constituting all things." We'll come to the "constitution" accounts soon in the section on mereological phenomenalisms.

\(^{10}\) Quotations from Adams's translation of Leibniz's comments on Berkeley's Principles, in A, 222; original text in Willy Kabitiz, "Leibniz und Berkeley," Sitzungsberichte der preussischen Akademie der Wissenschaften, Philosophisch-historische Klasse N. xxiv (Jargang 1932), 636.
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For now simply notice that the text on which P-ILL and P-REAL are based is, for Leibniz, uncharacteristically epistemic. He's offering little more than five-finger exercises for sorting out veridical from illusory perceptions. The analysis does not penetrate very deeply into the metaphysics beneath the perceptual process—as is evident especially from the fact that aggregates and corporeal substances aren't given distinct accounts. When the criteria of P-REAL are fulfilled, a giraffe and the pile of stones it's standing next to are both equally judged “real phenomena.” Since these two accounts carry little metaphysical punch, they will not be used to construct our final comprehensive lists of sufficient conditions for Leibnizian bodies.

Most of the texts are like those we've already examined in section 1. In them Leibniz is hard at work on the metaphysically serious side of the perceptual process. One salient mark of this deeper concern is his insistence that aggregates and corporeal substances be treated quite differently.

When discussing distinctively perceptual features of objects, he nearly always concentrates exclusively on aggregates. Relatively little is said about how corporeal substances are perceived. Still, it is well to remember that they are: the giraffe is just as visible as the pile of rocks.

Following Leibniz's restriction of the metaphysically serious perceptual analyses to aggregates, we'll splice together all the elements of mental and derivative phenomena (which represent two different construals of aggregates) so far examined and present a comprehensive perceptual account of aggregates. They will be said to gain unity, color, continuity, and reality from the mind's activity. As I said above, Leibniz himself seldom adds “reality” to the list of perceptual features. Among the rare texts that might be read as supporting such an approach is one directed to Des Bosses: “Aggregates themselves are nothing but phenomena, for everything except the component monads is added by perception alone, from the very fact of their being simultaneously perceived” (G 2:517/R 249; cf. G 3:622–23; G 2:270/AG 181). Since “everything” is added

11What Leibniz does say is fairly vague—though it's explained more fully in Adams's nice reconstruction at A 231–36.

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by perception, and reality is attributed to the aggregates (and not just to their separate parts), reality seems to be added by the perceiving mind.

If Leibniz considered mental and derivative phenomena to be amenable to a single metaphysical analysis, then the perceptual account of aggregates, P-AGG, represents that claim:

\[
P-AGG: x \text{ is an aggregate at } t \text{ only if: at } t \text{ there is some } P \text{ that is in some } si \in \{S\} \text{ such that: } si\text{'s representational content includes an extended appearance, } x, \text{ that is the result of } P\text{'s perceiving an infinite collection of substances in the phenomenal world; and } P \text{ considers } x \text{ to be a unified, colored, continuous, and real thing.}
\]

\[
x \text{ is an aggregate that persists from } tI \text{ to } tn \text{ only if: at each } ti \text{ between } tI \text{ and } tn, \text{ some } P1 \text{ is in some } si \in \{S1\} \text{ such that: } si\text{'s representational content includes an extended appearance, } x, \text{ that is the result of } P1\text{'s perceiving an infinite collection of substances in the phenomenal world; and } P1 \text{ considers } x \text{ to be the same unified, colored, continuous, and real thing that it perceived at the other } tis.
\]

\[P-AGG \text{ assigns the mind rather a Kantian role. In the synchronic account, it constructs } x \text{ by reading unity, color, continuity, and reality into what is really a collection of many colorless, discrete, and only separately real things. Apart from the mind's work, there is literally nothing in nature over and above the separate parts. As Russell says, Leibniz's position is reminiscent of the "synthetic unity of apperception":}
\]

\[\text{The mind, and the mind only, synthesizes the diversity of monads; each separate monad is real apart from the perception of it, but a collection, as such, acquires only a precarious and derived reality from simultaneous perception. (R 116)}\]

In the diachronic account, \(x\)'s persistence is just as "precarious" as its synchronic unity, given the fact that it is an unreliable "in the head" affair: it depends on \(P1\)'s considering \(x\) to be the same thing as was perceived at other times in \(x\)'s career. There is no "outside
the head" constraint on the arrangement of the body's parts to well found x's persistence.

In P-AGG, si's representational content must include unconsciously perceived bodies. Leibniz tells Arnauld that aggregates "exist only in our mind, which bases itself upon the connexions or modes of genuine substances" (G 2:97/LA 121) and that the mind "takes the opportunity to link together" various modes of genuine substances as a matter of "convenience" (G 2:101/LA 126). Certainly not all of this "basing" and "taking" is carried out consciously. Of course, unconscious perception is easily accommodated in Leibniz's system: expanding si's content in this way is unproblematic. The addition of unconscious perception here underscores the move from light-weight to heavier-weight analyses: the "real phenomenon" criteria applied only to cases where fairly sophisticated minds were consciously judging their appearances coherent or not. With the advent of P-AGG, however, we begin to descend to the deeper monadic level, where much (or, in the case of the "naked monads" (G 6:611/L 645), all) of what is perceived is below the level of consciousness.

3. Mereological Phenomenalisms

This section will be divided into two parts. In the first aggregates will be analyzed; in the second corporeal substances.

In P-AGG aggregates were said to be made real by the mind. But most often Leibniz describes them as having a reality that clings to them independently of any mind: they seem to be composites of real, mind-independent parts in the phenomenal world. To Arnauld he writes:

[W]hat constitutes the essence of an entity through aggregation is only a state of being of its constituent entities; for example, what constitutes the essence of an army is only a state of being of the constituent men. (G 2:96–97/LA 121)

I admit that the body apart, without the soul, has only a unity of aggregation, but the reality remaining to it comes from its constituent parts which retain their substantial unity because of the living bodies
which are included in them without number. (G 2:100/LA 125; cf. G 4:395–96/AG 252–53; G 2:261/R 249)

And from 1704 and 1711, respectively, we have these:

[T]here are indivisible unities in things, since otherwise there will be in things no true unity, and no reality not borrowed. (G 2:267)

[A] mass is an aggregate of corporeal substances. (G 7:501–2; cf. G 3:260/AG 289)

There is a reality “remaining to” the “body apart, without the soul”; there is “in things” a reality that is “borrowed” by composite things. This reality isn’t attributable to (P-AGG’s) mental activity. Instead, it’s due to the reality of the parts themselves. As he says in the final quotation, a sample of mass is an aggregate of substances. That is straightforward mereology.

The mereological account of aggregates, M-AGG, again lists only necessary conditions. Persistence conditions won’t be offered since (1) unlike P-AGG, the mereological account can’t underpin x’s persistence with the “considerings” of P: perceivers are altogether left out of this analysis; (2) in Leibniz’s system there isn’t any “metaphysical glue” (beyond that of the persistence conditions on the parts) that can bind one “time-slice” of an aggregate to another; and (3) Leibniz doesn’t commit himself to any constraint on how much those slices must overlap.

I shall now and then talk of aggregates as if they were mind-independent collections over and above their parts. This follows Leibniz’s tendency to accommodate the language of common sense and physical science for the sake of explaining “the phenomena.” As he tells De Volder, strictly speaking entelechies can’t impel bodies, but “in the phenomena, that is, in the resulting aggregate, everything is explained mechanically, and masses are understood to impel one another” (G 2:250/AG 175–76). The analysis below should be read in that spirit. Talk about extra-mental aggregates is loose, but useful. The collection is just the parts taken together; those parts aren’t sewn up with any kind of “metaphysical thread” or unified by any metaphysical principle.

M-AGG: x is an aggregate at t only if: at t there is some infinite collection of substances, {C}, such that each ci ∈ {C} is a proper part of x.
ci is a proper part of x just in case (i) \( ci \neq x \); (ii) \( x \) is divisible\(^{12}\) into at least two parts, one of which is \( ci \); (iii) \( is a proper part of \) is transitive; and (iv) \( ci \) partly composes \( x \) in every possible world in which \( x \) exists.

One may doubt whether Leibniz would endorse (iv). Certainly he allowed that over time aggregates take on and lose parts (G 2:193/L 521). But the identity of indiscernibles, which in the New Essays (II.xxvii.3-4) is applied freely to such aggregates as fallen leaves, seems to guarantee that a heap of rocks contains its constituent parts necessarily at any given time. A difference in constituents is the only basis for distinctness between aggregates.

It might be objected that M-AGG hardly deserves to be called a version of “phenomenalism,” since it is so far from English empiricist phenomenalisms. But it does deserve the title ‘phenomenalism’ in the levels sense—that is, these aggregates that are pulling their reality from their parts are on the phenomenal level of Leibniz’s scheme.

In M-AGG I’ve included no constraint on the arrangement of the cis so as to form \( x \). Typically the arrangement relation between a body and its parts is construed as a spatial one. On the familiar Newtonian scheme, a body “contains” all its parts in the sense that it snugly fits a region of space, and all of its parts are in proper subregions of that region.

Will the same picture apply to Leibnizian aggregates? In an important recent article, Robert M. Adams has pressed this question of a “principle of aggregation,” and seems to favor the Newtonian model. He writes,

First . . . we have to consider what is the principle that determines how substances . . . are grouped together to form a body. . . . I think it is fairly clear that a body will be an aggregate of all or most of the substances whose positions are within some continuous three-dimensional portion of space. What portion of space that is, and which substances are members of the aggregate, may change over time, of

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\(^{12}\)Here ‘divisible’ will have to be metaphorical in the cases where monads are the constituents, since monads have no size, and so Leibniz can’t mean that extended bodies are literally divisible up into nonextended parts. Some of these constraints on proper parts are derived from Roderick M. Chisholm, “Parts as Essential to their Wholes,” Review of Metaphysics 26 (1973): 581–603.
course. This spatial togetherness is a necessary condition for any corporeal aggregation, but it is presumably not a sufficient condition. . . . For such unity, additional, quasi-causal conditions on the way in which the members of the aggregate change their positions relative to each other will also be necessary. (A 237)

Turning to the question of what determines the positions of these substances, Adams says that in the case of corporeal substances, "[t]he position of the corporeal substance will surely be the position of its organic body. The organic body is a phenomenon, spatial position is a phenomenal property, and the spatial position of the organic body is given in appearance" (A 237). When the substances are monads, they are granted "spatial positions" by "assigning to each simple substance the spatial position of its organic body (cf. G 2:253/L 531), for, according to Leibniz, each simple substance is the dominant monad of an organic body" (A 237).

In support of Adams, a few texts from the mature period seem to indicate that bodies and monads are in space. The strongest passage is his remark to De Volder in 1705 that "... no assignable part of space [spatii] is without matter" (G 2:278/R 245). He had told De Volder two years earlier:

Although monads are not extended, they nevertheless have a certain kind of position [situs] in extension, that is, they have a certain ordered relation of coexistence with others, namely, through the machine which they control. . . . Extended things involve a plurality of things endowed with position, but things which are simple, though they do not have extension, must yet have a position in extension. (G 2:253/L 531)

And to Des Bosses in 1709 he writes:

Perhaps someone would say that souls . . . are in a place [loco] only through correspondence and that they are thus in the whole organic body which they animate. . . . But because such a thing cannot be explained by the phenomena and changes nothing in them, I cannot explain any more distinctly of what this union formally consists. It is enough that it is tied up with the correspondence. (G 2:371/L 598)

Clearly Leibniz is attributing some sort of position to bodies, since he's using them as a way to locate monads or souls. But we should resist the temptation to call it spatial position. Notice that the term
‘space’ isn’t used in any but the first text, which seems to be a rare departure from themes found in the clear majority of texts. In the others, vague gestures towards spatial concepts are all we get—“a certain kind of situation in extension,” “a position in extension,” and “place,” but never “space.” In the last passage to Des Bosses he even puts the claim in the mouth of someone else, and handwav-ingly denies that he can do better than the vague “correspondence in the body they animate.”

Recall from section 1 that Leibniz claims it’s an error to think of aggregates as having (P-AGG’s) spatial continuity. It is the “fault of our senses” that we “conceive physical things as mathematical beings” that have “some indeterminacy”—that is, true continuity (G 7:563). As J. E. McGuire notes, “. . . extended things are . . . in reality a plurality of substances that appear to be continuous. . . .”

The fact that extension involves spatial concepts does not threaten the distinction between it and space. Leibniz holds that spatial concepts can be “useful” (G 7:401; cf. G 4:569/L 583; G 6:584/L 621–22; G 2:282–83/L 539) in helping us keep track of the relative locations and movements of bodies—provided that we don’t let them fool us into thinking of bodies as actually continuous in the sense of being arbitrarily divisible. Thus spatiality does migrate a bit from its home in the ideal realm down into the phenomenal realm due to the work of the mind. In the passage above, Adams seems to be thinking of spatial quality in this sense, since he construes it as a phenomenal quality deriving from the way an aggregate appears to perceivers.

But Leibniz says that there is one type or “side” of extension that really is present at the phenomenal level—namely, the spread-out-ness of bodies. Let us call this extension of bodies concrete bodily extension to distinguish it from abstract, ideal, truly continuous “extension”—that is, space. He explains this concrete bodily extension when he writes in 1702:

[S]ince extension is a continuous and simultaneous repetition . . . ., it follows that whenever the same nature is diffused through many things at the same time, as, for example . . . resistance or impenetrability is generally in body, extension is said to have place [locum].

13McGuire, “‘Labyrinthus Continui’,” 306.
However, it must be confessed that the continuous diffusion of color, weight, malleability, and similar things that are homogeneous only in appearance is merely apparent, and cannot be found in the smallest parts. . . . (G 4:394/AG 251)

And in a 1711 dialogue critical of Malebranche there is this:

[E]xtension . . . implies some quality, some attribute, some nature in the subject which is extended, which is expanded with the subject, which is continued. Extension is the diffusion of that quality or nature.

. . . [T]here is . . . in body in general an extension or diffusion of antitypy or of materiality. (G 6:584/L 621; cf. G 7:398–99)

Thus, whereas there is no such thing as a region of arbitrarily divisible space in the phenomenal world, there are regions of concrete bodily extension—places in which the discrete parts of bodies actually are diffusing force, resulting in a body with "resistance," "impenetrability," "antitypy" or "materiality." Notice just how non-perceptual this picture is. Leibniz isn't telling us about how aggregates appear to us—that's a separate account, and one that is misleading to the extent that it attributes spatial continuity to them.

But despite these differences between them, Adams doesn't sunder the perceptual account from the mereological one. Though he recognizes that they are conceptually distinct and that they might be taken for "two competing analyses" (A 247), he keeps them together. Leibniz, he claims, regarded them as (1) consistent (see G 2:267; G 2:270/L 537; G 3:622f.) and (2) "at least materially equivalent." Adams explains the material equivalence:

I think . . . that there is a true scientific story [i.e., that organic bodies have positions in a coherent system of phenomena that are represented by most of the perceptions of all perceivers] that is always at least unconsciously perceived by all monads, that most of what appears consciously to conscious perceivers fits at least approximately into that story, that there are infinitely many monads whose properties are expressed by organic bodies that would figure in a sufficiently detailed extension of the true scientific story, that aggregates of these monads . . . can . . . be regarded as the bodies that figure in the true scientific story, and thus that the bodies of the true scientific theory are real according to both accounts, both as coherent phenomena and as aggregates of real things. (A 246–47)
There is no doubt that on Leibniz's showing the accounts are consistent: aggregates can be apparently unified, colored, and continuous phenomena and yet actually be nonunified collections of colorless, discrete things. But it is Leibniz's explicit discounting of the perceptual qualities in favor of the mereological ones that makes the consistency possible. Since Adams doesn't follow Leibniz in this, Adams owes us an explanation of how the accounts are consistent on his interpretation.

Material equivalence is even harder to establish, especially if the accounts are spelled out in detail. At a very abstract level they might seem equivalent:

(i) \( x \) is a coherent phenomenon perceived (possibly unconsciously) by all monads iff \( x \) is an aggregate of an infinity of monads or corporeal substances whose properties are expressed by those organic bodies referred to by the true scientific account of the world.

But when we include details the equivalence vanishes:

(ii) \( x \) is a unified, continuous, and colored coherent phenomenon perceived (possibly unconsciously) by all monads iff \( x \) is a nonunified and discontinuous aggregate of an infinity of colorless monads or corporeal substances whose properties are expressed by those organic bodies referred to by the true scientific account of the world.

(ii) is incoherent because it attributes to \( x \) logically incompatible properties. It can regain coherence only by using Leibniz's maneuver—namely, changing '\( x \) is a unified . . . phenomenon' to '\( x \) appears to be a unified . . . phenomenon'.

So Adams's attempt to construe spatial position as a "phenomenal property" that is "given in appearance" won't work for the mereological model. A logical barrier prevents us from transferring spatial continuity from the perceptual to the mereological account. Of the three main perceptual properties—unity, color, and spatial continuity—Leibniz says spatial continuity is, from a metaphysical standpoint, its most misleading feature. Thus, far from spatial proximity being a necessary condition for aggregates, it is irrelevant to their composition.
I emphasize that we are following Leibniz in cutting perceptual construals free from nonperceptual ones. Among the perception-independent properties Leibniz attributes to aggregates (in texts like those we'll examine presently) are discreteness, concrete bodily extension, duration, motion, derivative force, and antitypy, but not spatiality. The closest aggregates come to being in space is their having concrete bodily extension. But for Leibniz the fact that bodies are extended does not entail, as it did for Newton and others, that bodies are in space.

Putting the Newtonian and Leibnizian theories to Locke's "vacuum test" will help clarify the difference between them. Suppose we have a body. Suddenly it's annihilated—say by God, to ensure there's no residue. What's left? Newton (and Locke) would say that the region of space it occupied is still there, serenely holding its spot in the eternal and immovable matrix of absolute space. Leibniz, by contrast, must say that literally nothing is left. Concrete bodily extension is the diffusion of some quality or nature. By hypothesis, the quality or nature is no longer there to be "continued" or extended, and so (per impossibile, for Leibniz (G 2:193/L 521)) we'd be left with an utter and complete metaphysical vacuum.

Here we have a much different picture of Leibniz's phenomenal world than the one offered on Leibniz's behalf by Adams. By following out the implications of the perceptual story, Adams is led to suggest that Leibniz's phenomenal world is a lot like the Newtonian world, where one gets an aggregate by crowding parts into more and more closely neighboring regions of space. Leibniz can't be thinking of aggregates as constructed on that model.

But Leibniz himself is guilty of generating confusion on this topic. He sometimes obscures his space/extension distinction by using 'extension' to mean what he normally would be calling "space"—especially when addressing an audience allied with the Cartesians. Fortunately, the context usually disambiguates 'extension'. When he's using 'extension' to mean space rather than concrete bodily extension, he typically classifies it with motion, time, mathematical bodies, and other ideal continuous items, as he does in his 1702 response to Bayle:

I acknowledge that time, extension, motion, and the continuum in general, as we understand them in mathematics, are only ideal things—that is, they express possibilities, just as do numbers. . . . But
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to speak more accurately, extension is the order of possible coexistence, just as time is the order of possibilities that are inconsistent but nevertheless have a connection. . . . But space and time taken together constitute the order of possibilities of the one entire universe, so that these orders—space and time, that is—relate not only to what actually is but also to anything that could be put in its place, just as numbers are indifferent to the things which can be enumerated. The inclusion of the possible with the existent makes a continuity which is uniform and indifferent to every division. . . . [T]he actual world does not remain in this indifference of possibilities but arises from the actual divisions or pluralities whose results are the phenomena. . . . (G 4: 568/L 583)

The "actual world" doesn't remain in an "indifference of possibilities": that means that actual bodies can't be in space, since otherwise they'd be, like Cartesian bodies, indifferently divisible into an infinite variety of parts. Putting bodies in space would make them as continuous as the space itself. As C. D. Broad says of Leibnizian matter:

Matter is not continuous in the sense in which the space of the geometers is said to be so. For that kind of continuity consists in having no definite units, and being divisible in innumerable possible ways but not actually divided in any. Matter . . . is actually divided into natural intrinsic extended units. 14

Bodies belong on the phenomenal level as "pluralities" of discrete substances; space belongs on the ideal level since it has no actual parts and is arbitrarily divisible into merely possible parts.

It is important to note that Leibniz is not denying the infinite division of bodies. That, he says, already holds in virtue of their being composed of an infinite number of discrete substances. What he objects to is, as Broad says, arbitrary infinite divisibility—that is, what we've been calling "spatial continuity." Were bodies spatially continuous, they would be indeterminate at the core and thus would lose all claim to reality. In 1703 he develops this theme, telling De Volder that there must be a radical metaphysical separation of "real" actual bodies from ideal space and time:

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[I]t follows from the very fact that a mathematical body cannot be
analyzed into primary constituents that it is also not real but some-
thing mental and designates nothing but the possibility of parts, not
something actual. A mathematical line, namely, is in this respect like
arithmetical unity; in both cases the parts are only possible and com-
pletely indefinite. . . . But in real things, that is, bodies, the parts are
not indefinite—as they are in space, which is a mental thing—but
actually specified in a fixed way according to the divisions and sub-
divisions which nature actually introduces. . . . (G 2:268/L 535–36)

In this stretch of correspondence he returns to the same motif in
1705, where he surrounds the inconsistency mentioned earlier with
lots of familiar themes:

Matter is not continuous but discrete, and actually infinitely divided,
though no assignable part of space is without matter. But space, like
time, is something not substantial, but ideal, and consists in possibili-
ties, or in an order of coexistents that is in some way possible. And
thus there are no divisions in it but such as are made by the mind, and
the part is posterior to the whole. In real things, on the contrary, units
are prior to the multitude, and multitudes exist only through units.
(The same holds of changes, which are not really continuous.) (G
2:278–79/R 245)

That problematic comment might be an ill-expressed version of his
doctrine that no part of nature is empty. If so, it was better put here:

[P]arts can be replaced by others in every extended body. Thus no
part has a necessary connection with any other part, even though it is
ture of matter in general that when any part is removed, it must
necessarily be replaced by some other part. (G 2:193/L 521)

Finally, there is this from the Des Bosses correspondence of 1709:

Mass and its diffusion result from monads, but not space. Space, just
like time, is a certain order . . . which embraces not only actuals, but
possibles also. Hence it is something indefinite, like every continuum
whose parts are not actual, but can be taken arbitrarily. . . . Space is
something continuous but ideal, mass is discrete, namely an actual
multitude, or being by aggregation, but composed of an infinite num-
ber of units. In actuals, single terms are prior to aggregates, in ideals
the whole is prior to the part. (G 2:379/R 256, 245; cf. G 2:336; G
2:282/L 539)
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Given those texts, it seems that if we want to know what “principle of aggregation” the historical Leibniz had in mind for aggregates construed mereologically, the supposed “spatial positions” of their parts won’t help us. Space is an ideal, abstract, continuous, arbitrarily divisible grid that has no actual parts; aggregates are phenomenal, concrete, discrete, actually divided bodies that are made up of an infinite number of actual parts.

It won’t do to suppose this is a mere logomachy—as if Adams could correct his account by simply replacing all occurrences of “space” and its derivatives with those of “extension.” This would be only a cosmetic change. Adams does recognize that in Leibniz’s opinion, “... the aggregation of monads by spatial relations, to form bodies, is ... dependent on perception since monads do not have spatial properties in their own right but are spatially represented in our perceptions” (A 241). Still, instead of following Leibniz in throwing the perception-relative “spatial relations” on the scrap heap, he pushes them into earnest metaphysical service. They are to act as “the principle of grouping that defines the aggregate” (A 241). Those spatial relations bring with them the very “side” of extension Leibniz most wanted to avoid attributing to aggregates: perfect continuity.

Thus Adams finally pays the price for ignoring the perceptual-mereological distinction. He finds a perfectly representative text puzzling:

Can aggregates of substances possess the physical properties that bodies have in the story told by science? It might seem, in particular, that an aggregate of simple substances would not be continuous because it is composed of parts that cannot be divided again into parts and that do not adjoin or overlap each other. Leibniz seems to say as much himself in his last letter to De Volder (G 2:282/L 539); but that passage is a difficult one in which he also appears to have forgotten his doctrine that aggregates, even aggregates of real things, are phenomena. (A 242)

One person’s lapsus is another’s locus classicus: here is the “difficult passage,” crammed full of claims that accord perfectly with the others we’ve examined:

... [I]n actual bodies there is only a discrete quantity, that is, a multitude of monads or of simple substances, though in any sensible
aggregate or one corresponding to phenomena, this may be greater than any given number. But a continuous quantity is something ideal which pertains to possibles and to actualities only insofar as they are possible. A continuum, that is, involves indeterminate parts, while on the other hand there is nothing indefinite in actual things, in which every division is made that can be made. . . . [T]he parts are actually in the real whole but not in the ideal whole. But we confuse ideal with real substances when we seek for actual parts in the order of possibles, and indeterminate parts in the aggregate of actual things, and so entangle ourselves in the labyrinth of the continuum. . . . (G 2: 282/L 539)

Adams misses a crucial turn in Leibniz's subtle way through that "labyrinth" when he offers this "solution" to the puzzle:

We could say, however, that, though monads may be elements of corporeal aggregates, the relevant parts of the aggregate are not monads but subaggregates containing infinitely many monads. The aggregate will be divisible in indefinitely many and various ways into subaggregates of this sort, which will themselves be similarly divisible into subaggregates and which may overlap each other in their membership or may share a common "boundary" of monads. In this way, the aggregate as such can have the mathematical structure of continuity. (A 242)

Several things need to be said about this passage: First, Adams can postulate "subaggregates" only by (i) assuming there's a principle of aggregation for them—something that, with the collapse of the "spatial position" line, is dubious; and (ii) assuming, against our textual evidence, that Leibniz would accept as coherent the notion that monads can have the spatial position they'd need in order to be located along the "boundaries" of subaggregates. Against (ii) there is an additional text from 1714 that seems decisive:

We must not conceive extension as a real continuous space, strewn with points. These are fictions proper to content the imagination. . . . Nor must we conceive that monads, like points in a real space, move, push, or touch each other; it is enough that phenomena make it seem so. . . . (G 3:623/R 255)

Second, even apart from the difficulties of attributing spatial position to monads, there is the larger issue of squaring this claim with the thrust of Leibniz's mature doctrine of the continuum.
What Leibniz saw as his most profound "solution" to the continuum problem involves the claim that no bodies in nature can be what Adams here says they can be—"divisible in indefinitely many and various ways." As we've seen, Leibniz's parts for all bodies are exemplary in their discreteness: they are perfectly one. (Adams seems to think it's only simple-substance-composites that would create problems, but corporeal-substance-composites would be just as problematic, since both types of substances are discrete.) Those perfectly discrete parts can't be taken and transferred to some intermediate level between the deepest monad level and the superficial aggregate level, there to be mixed up so thoroughly that they finally somehow lose their discreteness and get blended together into subparts of a genuinely continuous whole. It would be like trying to turn a pile of sand into glass by placing some of the sand particles edge to edge. For Leibniz, only space is genuinely continuous; it is a whole that can be divided up "in indefinitely many and various ways." But bodies can't: they're already divided into discrete parts in a determinate, nonarbitrary way. If Adams were right, God would in some cases have to make an arbitrary decision about which subaggregate—s1 or s2—monad m belonged to since it would be on the "boundary" between the two subaggregates. This is dramatically at odds with Leibniz's claim that the parts of matter are "specified in a fixed way according to the divisions and subdivisions which nature actually introduces . . ." (G 2:268/L 536).

Failing to uncouple the perceptual (P-AGG) and mereological (M-AGG) accounts of aggregates results in what Leibniz calls "confusing the ideal with the real." By looking for the parts of bodies among indeterminate subaggregates, Adams is doing what Leibniz says one can't do when handling questions about the continuum—searching for "indeterminate parts in the aggregate of actual things" (G 2:282/L 539).

Can we answer Adams's original question: what is Leibniz's principle of aggregation for aggregates considered mereologically? Adams rightly rejects Russell's attempt to answer this by appeal to the points of view of monads (A 238–39). His only other suggestion concerns "quasi-causal conditions on the way in which the members of the aggregate change their positions relative to each other." But the single text (G 2:100/LA 126) marshalled in support of it seems readily construable as a perceptual feature—a constraint on the
“connexions between the constituents” of aggregates that the mind notices when it unifies the aggregate.

And if Adams’s proposed substitute fails, what works? Nothing. Leibniz never tells us that any metaphysical principle binds the parts of an aggregate together. In fact, if there were such a principle, it would contradict his claim to Arnauld that an entity through aggregation “is only a state of being of its constituent entities.” There just is nothing there over and above the parts, in metaphysical rigor. Aggregates may be perceived as colored, but it doesn’t follow that they are. Similarly, their parts may be perceived as closely bound together in a continuous whole, but it doesn’t follow that they are close together in any intelligible sense of ‘close’.

Actually, it’s unremarkable that he had nothing to say about principles of aggregation. Aggregates are too sloppy to be united by any metaphysical principle. In the case of such special aggregates as organic bodies, we aren’t surprised to find Leibniz saying a bit about how the parts must be arranged so as to form a “machine” (G 4:480–82/L 455–56; G 2:251/L 529–30; G 6:598–600/L 636–37; C 13–14/P 175; G 4:396/AG 253; Monadology, secs. 63–64). Moreover, we’d expect such super-special, truly unified bodies as corporeal substances to be united by a metaphysical principle—and sure enough they are: by dominant monads. But a principle of unity for a sand dune? That’s completely alien to Leibniz’s cast of mind. The most we know about aggregates is that when they’re perceived their parts seem to be close together, but there just is nothing to know about why those parts count as being together. What he said to Arnauld seems to hold for nongenuine substances (aggregates) as well as genuine ones: “One will never find any fixed principle for making a genuine substance from many entities by aggregation . . .” (G 2:101/LA 127).

We turn now to Leibniz’s mereological account of corporeal substances. This involves what might be called an “enriched” mereology, since instead of letting all the parts perform an equal role in constituting the whole, it singles out one special part as that which is most crucial in forming the composite. That one part—the dominant monad—is assigned the role of supervisor or unifier of the others.

We can begin with a passage to De Volder (G 2:252/L 530–31) in which Leibniz (conceptually) isolates four items that join together
to form a complete organism. Combining this anatomy of corporeal substances with material from other texts we get the following:

(1) *the soul*; "primitive entelechy"; "substantial form"; "the first recipient of activity" originally possessing the "law of the series" (G 4:512/L 504; G 2:262/L 533); has primitive active force (GM 6:236/L 436; G 2:250–51/L 529–30; G 3:622; G 7:502; G 2:270/L 537; G 4:395/AG 252; G 3:260/AG 290; G 3:356; G 3:457).

(2) *primary matter*; has primitive passive force (GM 6:236–37/L 437).

(3) *the complete (dominant) monad* formed by (1) and (2); possesses the "law of the series" because it is partly composed of (1) (G 2:262/L 533); has primitive active and passive force (G 2:251/L 530), or simply "primitive force."

(4) *mass* (Latin *massa*); "secondary matter"; (composes) "aggregates"; is a "well-founded phenomenon"; has unity *per accidens* (G 2:76/LA 94; G 3:657); (appears as) "phenomena"; the "organic body" or "organic machine" composed of subordinate monads; has derivative passive force (GM 6:237/L 437).

(5) Together (3) and (4) constitute "the animal or corporeal substance which the dominating monad makes into one machine" (G 2:252/L 530–31); has life (C 13–14/P 175); has unity *per se* (G 3:657); has derivative active and passive force, or "simply derivative force."

We have (5) when the conditions for the mereological analysis of corporeal substance are realized:

**M-CORP:** *x* is a *corporeal substance* at *t* only if: at *t* there is an infinite collection, {C}, of substances and a dominant monad, *D*, that unites itself so completely with {C} that together with {C} it forms a living thing, *x*.

*x* is a *corporeal substance* that persists from *tI* to *tn* only if: at each *tj* between *tI* and *tn*, there is an infinite collection {Cj}, of substances and the same dominant monad, *DI*, which unites itself so completely with {Cj}
Leibniz explicitly allows the “secondary matter” or “organic bodies” of corporeal substances to take on and lose parts constantly over time (G 2:193/L 521; C 16/P 178; G 2:120/LA 153; G 6:601/L 638); thus in the diachronic version of M-CORP there is no requirement that the same \{C\} partly constitute a persisting corporeal substance during its entire career. Still, he insists that “. . . souls never leave the whole of their body, and do not pass from one body to another which is entirely new to them” (G 6:601/P 199). Thus each collection must share at least one part with the previous one. A given \{C\} is a “temporarily [pro tempore] immediate requisite” (G 2:120/LA 153) for an animal’s existence at any time, but that particular \{C\} need not partly compose it at any later time. $D_1$, not \{C\}, carries identity. Here ‘living thing’ means something that is alive only in a very general sense—it may be like the naked monads.

Adams asks for and doubts that he can find an account of how the dominant monad “forms a living thing” out of itself plus an organic body:

> Given Leibniz’s doctrine that “there is nothing in things except simple substances, and in them perception and appetite” (G 2:270/L 537), there is no way for the unity of a corporeal substance to be anything over and above the system of relations among the perceptions of monads. (A 248)

Indeed, Leibniz offers us almost no account of how the dominant monad performs its magic. But acts of metaphysical legerdemain are common in his philosophy: what could be a more spectacular stunt than pulling monads out of a hat? Even if no account of how is available, dominant monads must make corporeal substances into true unities—if not, Leibniz can’t meet the demands of his “revisionary” metaphysics.

I said Leibniz offers “almost no account” because Leibniz addresses this question very briefly and obscurely in the correspondence with Des Bosses. There he develops the vexed notion of a “substantial bond.” It is vexed because in the course of expounding it he violates claims he makes repeatedly elsewhere, both before
and after the relevant letters. The bond is a “real unifier” everlast-
ingly attached to a dominant monad, which in turn is supervising the monads in an organic body. This violates the famous “nothing in things except simple substances” claim. If that is not enough, he says “substantially bonded” corporeal substances have “real conti-
uuity” (G 2:517)—that is, a nonperceptual continuity that is actu-
ally there independently of our minds. And that can’t be squared with the texts we’ve just examined concerning the discreteness of body.

For the sake of completeness, I’ll present a mereological analysis of substantially bonded corporeal substances. It is so far from the considered doctrines of mature Leibniz, however, that it won’t be developed in the final section into a comprehensive doctrine of body, and only necessary conditions for a synchronic account are provided:

\[ M\text{-BOND: } x \text{ is a substantially bonded corporeal substance at } t \text{ only if:} \]
\[ \text{at } t \text{ there is a corporeal substance, } y, \text{ to whose domi-
nant monad, } D, \text{ a substantial bond, } B, \text{ has been ever-
lastingly assigned so that } B \text{ makes } y \text{ into a perfectly con-
tinuous, real body, } x. \]

Before leaving this section, I must respond to some objections: On this view, (i) any arbitrary collection of monads will constitute an aggregate; (ii) a world might contain precisely the same sub-
stances as exist in this world, yet have no aggregates in it; and (iii) in 1712 Leibniz wrote, in a study for a letter to Des Bosses, that

the distinction between the appearance bodies have with respect to us and with respect to God is, in a certain way, like that between a draw-
ing in perspective and a ground plan. For there are different draw-
ings in perspective, depending upon the position of the viewer, while a ground plan or geometrical representation is unique. Indeed, God sees things exactly as they are in accordance with geometrical truth, although he also knows how everything appears to everything else, and so he eminently contains in himself all other appearances. . . . (G 2:438; AG 199)

As to (i), yes, any collection could constitute an aggregate—so long as it contained an infinite number of substances. The objector seems worried that the parts may be too “scattered” to be properly
unified, but that involves, again, bringing spatial matters to bear on Leibniz’s purely qualitative realm of substances. The substances exist and can be grouped in various ways by minds into collections, but the substances themselves aren’t grouped. The worry about arbitrariness seems not so much to conflict with Leibniz’s beliefs as to bear out his claim that they have mere unity per accidens (G 2:76/LA 94; G 3:657/R 226). To (ii) I reply that this world is the one described: it contains exactly the substances it has, and no extra-
mental aggregates.

Finally, (iii). This text keeps very bad company. In it Leibniz first adumbrates the notorious concept of a substantial bond that sur-

vives in the letter actually sent to Des Bosses. The bond is described here as a “relation through which one new substance arises from many substances” (G 2:438/AG 199). That’s anathema to the Leib-
niz who wrote to Arnauld that one will never find a fixed principle for generating a genuine substance from many by aggregation (G 2:101/LA 127). So when he says in the same breath that God knows things “exactly as they are in accordance with geometrical truth,” I think we’d better take it as noise, not message. Some support for this dismissal comes from the fact that this is one of the claims he withheld from the letter actually sent to Des Bosses. Des Bosses was to receive quite a few claims that compromised Leibniz’s official positions, but this one, we can suppose, was so far afield that Leib-
niz wouldn’t even send it to him.

Of course, given the proper interpretation it might not be pure noise. God knows all the substances thoroughly and he knows what relations they hold to each other through preestablished harmony. Some of these relations hold between a corporeal substance’s body’s perceptual organs and the surrounding substances, allowing for its confused perception of a collection of them as, say, a red ball. As the text says, God also knows what the red-ball-appearance looks like to finite substances. One could think of this on analogy with a set of monitors, one for each finite substance, that an om-
nsicient God is always scanning. But I am claiming, against any other interpretation of this text, that Leibniz’s considered opinion is that when all the monitors are turned off, aggregate-appearances, like colors, vanish in that instant. When God scans, not the monitors, but nature itself, he sees only substances—simple ones at the funda-
mental level, and corporeal ones in the phenomenal world. This is confirmed by Leibniz’s statement in a dialogue on Malebranche’s
theories—dated to the very same year as the Des Bosses study: “... [A] body is not a true unity; it is only an aggregate, which the Scholastics call a being per accidens, a collection like a herd. Its unity comes from our perception. It is a being of reason or rather, of imagination, a phenomenon” (G 6:586/L 623; G 2:306; G 2:250/L 529). (After translating that passage, Leroy Loemker, perhaps overcome by what I call “Leibniz scholar vertigo,” can’t forebear to exclaim in a footnote: “Thus Leibniz reaffirms his phenomenalism at the very time of his discussion of the vinculum substantiale and the real nature of bodies with Des Bosses” (L 628). There simply is more than one Leibniz writing about bodies in the mature period.) Thus on the textual matter I say: Leibniz issued the catalogue, but can’t really offer everything in it. The charitable commentator must order much less than everything, on pain of incoherence. So I’m declaring for the Leibniz who sent to several correspondents clear, bold claims that are almost never gainsaid elsewhere, and against the Leibniz who wrote but then withheld, in one tenuous exchange of letters, a radically inconsistent one.

Notice that in P-AGG, the subject of predication for an aggregate is an “extended appearance, x.” x is an appearance of an infinite collection of substances, but the aggregate isn’t identified with the collection. It’s identified with the appearance in a finite mind. This stands in marked contrast to M-CORP, where the subject of predication for a corporeal substance is an extra-mental “living thing, x.”

4. A Supervenience Phenomenalism

The supervenience model provides a different way of analyzing bodies. Since Leibniz says all bodies have the properties specified in the supervenience analysis, we won’t need to specify separate conditions for aggregates (considered here as extra-mental physical objects in accord with the scientific standpoint) and corporeal substances. All bodies will be said to have a derivative reality that supervenes on the primitive reality of their constituents, as gelatinity supervenes on the molecular structure of its constituents.

If supervenience is viewed, as it typically is, as a relation between families of properties, then it is quite a separate matter from mereology. Still, the topics are related. Jaegwon Kim calls a key principle closely allied to supervenience “mereological determinism”: “the
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Democritean credo that wholes are completely determined, causally and ontologically, by their parts, that if you make a replica of an object by putting it together atom by atom, particle by particle, you get the 'same' object.15 Thus a lake is reducible to the collection of its constituent water molecules: this is a lake iff these molecules are so related.

Supervenience, by contrast, is intended to be a nonreductive relation, and need not involve mereology at all. Of course, as Kim argues, strong supervenience—the one Leibniz endorses—seems on close scrutiny to be a reductive relation after all.16 But with respect to mereology, I can claim that my moral goodness supervenes on—is determined by—my purely descriptive features without presupposing a particular answer to the question, Am I reducible to parts which have purely descriptive properties? As Kim notes, most people who make the supervenience claim about properties do so at least in part because they're committed to the mereological claim—but the claims remain conceptually distinct.

Mereology may actually be sundered from supervenience in some unusual cases. For example, the properties of magnetic fields supervene on—are determined by—those of moving electric fields. But it is unclear how one might construe the electric field as part of the magnetic field. Perhaps this is sheer property-to-property supervenience, with no “mereological determinism” story tied to it. Since there is a conceptual difference and perhaps a real difference in some cases, I will follow Kim in distinguishing mereological supervenience from the more mainstream property supervenience.

Still, Leibniz takes the usual tack and presents mereological and property supervenience in tandem. As we have seen from our discussion of his mereological phenomenalisms, bodies are mereologically supervenient on their substances. To this he adds the further claim that their properties are property-supervenient on the properties of those more basic constituents.

Especially after 1695 Leibniz often claimed that derivative force forms the essential nature of all bodies and that it supervenes on the primitive force of the more basic substances “beneath” them. He

distinguishes between active and passive versions of these forces, but for our purposes we can ignore the active/passive distinction. Representative texts include these. First, from 1695:

Active force . . . is of two kinds. The first is *primitive* force, which is in all corporeal substance as such. . . . The second is *derivative* force, which is exercised in various ways through a limitation of primitive force. . . . We understand by derivative force . . . only that force which is connected with . . . local motion. . . . For we admit that all other material phenomena can be explained through local motion. (GM 6:236–37/L 436–37; cf. G 4:396/AG 253)

When writing to De Volder in 1703, he says we need only consider “derivative forces” in aggregates, since the aggregates arise “from the reality of the monads” (G 2:250/L 529), adding that “[d]erivative forces are in fact nothing but the modifications and echoes of primitive forces” (G 2:251/L 530). A year later there is this:

[U]nless there were some primitive active principle in us, there could be no derivative forces and actions in us, since everything accidental or changeable must be a modification of something essential or perpetual . . . since . . . a derivative force [is a modification or limitation] of that which it varies. (G 2:270/L 537)

That derivative force is in corporeal substances as well as aggregates is unmistakably confirmed in the last text, where he attributes it to “us,” the paradigmatic corporeal substances.

From derivative force proceeds all bodily change at the phenomenal level, and through it all “material phenomena” are to be explained. All other features of bodies—their extension, duration, and motion—flow out of this one “superproperty.” As he says in the last quotation, derivative force is a determinant or “modification” of the “essential or perpetual” determinable, primitive force. When a corporeal substance is a “large” one made up of many smaller ones, the larger one’s derivative force still *ultimately* finds its source in the primitive force possessed by those smaller corporeal substances’ constituent monads.

Like the mereological accounts, the supervenience analysis views bodies from a thoroughly extra-mental standpoint. But the mereological accounts trained the spotlight on the whole as dependent on its parts. By contrast, the supervenience analysis emphasizes the fact that the whole’s *properties* depend on the parts’ *properties.*
We are nearly ready to define Leibniz's property-supervenience relation. The modal claim inherent in that relation requires a strong, but less than logically necessary, connection to hold between "subvenient" and supervenient properties. Leibniz endorses this strong connection when in the *New Essays* he tells Locke why one can't just arbitrarily assign "inexplicable" properties like gravitational attraction to matter:

"[T]he modifications which can occur to a single subject naturally and without miracles must arise from limitations and variations of a real genus, i.e. of a constant and absolute inherent nature. . . . Whenever we find some quality in a subject, we ought to believe that if we understood the nature of both the subject and the quality we would conceive how the quality could arise from it. So within the order of nature (miracles apart) it is not at God's arbitrary discretion to attach this or that quality haphazardly to substances. He will never give them any which are not natural to them, that is, which cannot arise from their nature as explicable modifications."

This means God keeps the supervenience-subvenience relations nonarbitrary for *would-be human knowers*. He is not bound by the laws of logic to do so. Thus the *ws* in *Df. 1* range over only non-miracle-containing worlds. *A* and *B* are taken to be representatives of typical supervening families of properties—say mental and physical or, as in Leibniz's case, derivative and primitive force.

**Df. 1**: Property *A* strongly supervenes on property *B* iff for any object *x* and any world *wi*, if *x* has *B* in *wi*, then *x* has *A* in *wi*.18


18This construal of strong supervenience is a simplified version of Jaegwon Kim's in his article "Supervenience," in *Handbook of Metaphysics and Ontology*, ed. H. Burkhardt and B. Smith (Munich: Philosophia, 1991), 2:877–79. The restriction to "typical supervening families of properties" is designed to rule out the possibility that simple covariant properties like equilateral and equiangular might strongly supervene on each other by *Df. 1*.
In typical applications of strong supervenience, more than one subvenient property can “ground” a given supervenient property, so that, for example, several different molecular structures can ground the brittleness of a plastic plate. Leibniz specifies only one possible kind of subvenient property—primitive force—for derivative force, but he likely thought that many different instances of that property could underwrite the same derivative force upshot. Two qualitatively identical peanut butter sandwiches might have different subvenient bases—one with a total quantity of primitive force, F1, and the other a different quantity, F2.

Leibniz’s supervenience analysis of body is captured in S-BODY. Again only necessary conditions are offered. No diachronic account will be given because some of these bodies are aggregates for which, as mind-independent collections, there are no perceivers whose “considerings” can provide even a weak persistence.

S-BODY: x is a supervenient body at t only if: at t there is an aggregate or corporeal substance, x, that (i) mero logically supervenes on an infinite collection, {C}, of substances and (ii) is in a derivative force state that strongly supervenes on the primitive force states of the ultimate members of {C}.

The “ultimate” members of {C} are monads. When x is an aggregate, condition (i) requires that it abide by the strictures of M-AGG; when it’s a corporeal substance, those of M-CORP.

5. Combining the Accounts

For a comprehensive account of aggregates, AGG, we’ll meld together themes from P-AGG and M-AGG. As we have seen, we must be careful to construe as merely apparent the aggregate’s perceived qualities (of unity, color, continuity, and reality) in the resulting synthesis. We’ll follow P-AGG in allowing unconscious representational content into the sis, since Leibniz requires this in order to make plausible his claim that every perceiver (rather than just “some P(1)”) perpetually perceives all the aggregates. As in P-AGG, the perceiving substances of AGG will ensure that a weaker “in the head” duration can be attributed to x. Finally, we’ll take AGG’s (and
the following CORP's) "infinite collection of substances" to meet the conditions laid down in M-AGG.

AGG: $x$ is an aggregate at $t$ iff: at $t$ each $P$ is in some $si \in \{S\}$ such that: $si$'s representational content includes an extended appearance, $x$, that is the result of $P$'s perceiving an infinite collection of substances in the phenomenal world; and $P$ considers $x$ to be a unified, colored, continuous, and real thing.

$x$ is an aggregate that persists from $t1$ to $tn$ iff: at each $ti$ between $t1$ and $tn$, each $P$ is in some $si \in \{S\}$ such that: $si$'s representational content includes an extended appearance, $x$, that is the result of $P$'s perceiving an infinite collection of substances in the phenomenal world; and $P$ considers $x$ to be the same unified, colored, continuous, and real thing that it perceived at the other tis.

Next, corporeal substances. By contrast with AGG, but like M-CORP, the persistence represented here is well founded: corporeal substances have a true unity across time rather than one that depends on the "considerings" of $P$. Also, unlike an aggregate's unity, which depends solely on $P$'s "considering" $x$ to be a unified thing, a corporeal substance's perceived unity is well founded on the mind-independent unity of the corporeal substance itself.

CORP: $x$ is a corporeal substance at $t$ iff: at $t$ each $P$ is in some $sj \in \{S\}$ such that: $sj$'s representational content includes an extended appearance due to the fact that $P$ perceives a dominant monad, $D$, uniting itself so completely with an infinite collection, $\{C\}$, of substances that it forms a living thing, $x$.

$x$ is a corporeal substance that persists from $t1$ to $tn$ iff: at each $tj$ between $t1$ and $tn$, each $P$ is in some $sj \in \{S\}$ such that: $sj$'s representational content includes an extended appearance due to the fact that each $P$ perceives the same dominant monad, $D1$, uniting itself so completely with an infinite collection, $\{Cj\}$, of substances (where $\{Cj\}$ shares at least one part with the $\{Ci\}$ to which $D1$ was joined at the immediately preceding $ti$) that it forms a living thing, $x$. 

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We can now add the concept of supervenience to elements from these two analyses for a perfectly general account of body:

*BODY:* $x$ is a body at $t$ iff: at $t$ each $P$'s representational content includes either a supervenient aggregate, $x$, or a supervenient corporeal substance, $x$.

$x$ is a body from $tI$ to $tn$ iff: at each $ti$ between $tI$ and $tn$, each $P$ is in some $si \in \{S\}$ such that: $si$'s representational content includes either a supervenient aggregate, $x$, or a supervenient corporeal substance, $x$.

Leaving aside substantial bonds, *BODY* represents all of Leibniz's doctrines about matter. Every material object has a derivative force that supervenes on the primitive force of monads. Some of those objects are mere aggregates that, strictly speaking, have all their features supplied by the mind. The rest are corporeal substances possessing true unity. Every monad constantly perceives all of these aggregates and corporeal substances.

Leibniz's mature metaphysics of matter seems coherent, though enormously complex. The ways of phenomenalism are often difficult to spell out. Unlike most empiricist phenomenalisms, which require care to "translate" physical-object statements into "idea statements," the challenge facing Leibniz's commentator is sorting out the various accounts and paying careful attention to all the deep metaphysical constraints that were simultaneously at work in his system.\(^\text{19}\)

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