

The Nominalist Argument of the *New Essays*¹

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1.

There is in the *New Essays* a prominent line of argument that Leibniz took to have remarkable scope. If it works, it sweeps away most of the mainstays of Locke's metaphysics: atoms, vacuum, real space and time (bases of Locke's theory of individuation and identity), absolute rest, inactive faculties (both physical and mental), and the tabula rasa. It alone does not suffice to undermine the possibility of thinking matter, but it contributes support to that most important of Leibniz's claims against Locke.² Because it is so central to the project of *New Essays*, I am going to focus mainly on the argument as it is employed there; doing so illuminates both the work and the argument. But Leibniz used it (or one like it) a number of times in letters and notes from roughly the same time period (1698-1705) and it is related to a thesis in the *Discourse on Metaphysics* and letters to Arnauld.³ The argument invokes a distinction between abstract or incomplete entities and concrete or complete ones. Its premises are that atoms, vacuum, inactive substances (e.g. a mind without ideas, or passive matter), and other items on Leibniz's list are homogeneous or uniform; that all things that are uniform or otherwise exactly alike are abstract; and that nothing abstract can be found in nature.

I call this a "nominalist" argument (following Benson Mates), because it rejects the existence of abstract entities. Other scholars have noted that Leibniz was not, at least in later years, a "nominalist" in just the sense Mates claims that he was.⁴ His objection to abstract entities is not that it is logically impossible that they exist;⁵ it is rather that none exist in nature.⁶ And far from endorsing the nominalist program of finding locutions to replace all those that purport to refer to abstract entities, Leibniz claimed in the *New Essays* period that they cannot be eliminated from the discourse of science. Indeed, he claimed that principles whose logical subjects are abstract have an indispensable place even in the understanding of God. They are the reasons for concrete things, the physical and metaphysical laws, and the necessary truths that govern them.⁷

There are two questions I want to pursue here in connection with this argument against abstractions in nature. The first is what the operative notion of abstraction is. One might well agree with Locke that atoms or inactive substances, if they exist,

are determinate, spatiotemporally conditioned, particular, and individual. On what basis did Leibniz contend they are abstract? Since Leibniz contrasted abstract entities with things that nature allows, it would be helpful to proceed at once to define what he meant by 'nature'. But I am not going to undertake that here. For one thing, Leibniz often contrasted nature with miracle in contexts having to do with the powers God has granted to creatures. This is not unconnected with the attack on abstractions in *New Essays*, which encompasses certain notions of powers.⁸ But it is a part of the "nominalist" argument too complicated to consider here. Further, Leibniz's distinctive notion of nature is so closely linked with his reasons for regarding the existence of abstractions as problematic that the former can hardly be clarified as a preliminary to understanding the latter. As the discussion moves along, several characteristics of nature will emerge. They include: nature has an analogue of spatio-temporal relations, these relations have intrinsic foundations, nature is perceived by substances, and its reality consists in the existence of simple substances, their perceptions, and what is founded on them.⁹ But all of this is to come. The first question to be pursued is: what is Leibniz's conception of an abstract entity, in comparison with what occurs in nature?

The other question to be pursued here is: what prohibits the existence of abstract entities in nature? We know Leibniz had various arguments against atoms (e.g. in letters to Hartsoeker) and against the existence of space and time independent of bodies and events (e.g. in letters to Clarke)—the most familiar of these arguments turn on the principle of sufficient reason or principle of intelligibility.¹⁰ But the argument that concerns us here states that nature precludes atoms, independent space and time, and other "philosophers' fictions," *because* they are abstract. What precludes abstract entities, as such, from nature?

2.

In *New Essays*, Leibniz discussed two quite different types of abstractions although this seems not to be acknowledged by Mates.¹¹ One type separates some of the accidents that exist in a subject from the subject, e.g. heat in abstraction from a hot thing, or man in abstraction from Titius, Caius, etc. Locke's idea of substratum in which qualities inhere is treated as an abstraction of this sort. Leibniz warned that abstractions of this type breed confusion and ought to be avoided.¹² But he recognized a second type of abstract entity. Abstractions of this second type are indispensable for the sciences, but, Leibniz charged, they are often misused by "lazy philosophers" who fail to realize they are abstract.

Two prominent passages express this doctrine in *New Essays*.¹³ Here is one; it deals exclusively with the abstractions of philosophical error:

This *tabula rasa* of which one hears so much is a fiction, in my view, which nature does not allow and which arises solely from the incomplete notions of philosophers—such as vacuum, atoms, the state of rest (whether absolute, or of two parts of a whole relative to one another), or such as that prime matter which is conceived without any form. Things which are uniform, containing no variety, are always mere abstractions: for instance, time, space, and the other entities of pure mathematics. There is no body whose parts are at rest, and no substance which does not have something which distinguishes it from every other. . . . [I]nactive faculties—in short, the pure powers of the Schoolmen—are also mere fictions, unknown to nature and obtainable only by abstraction. . . NE 110; also see 57

Whereas one sort of abstraction separates accidents from substances in which they inhere, this passage mentions a sort of abstract entity that is *not* present in substances at all. The passage identifies certain properties, such as being an atom, at rest, being uniform, and *denies* that they belong to anything in nature. An abstraction clearly is not the conception of a proper subset of the properties or accidents that belong to a substance. Hence, the first question remains: what is it for atoms and uniform entities to be abstract, according to Leibniz?

While the text offers no definition, it does provide a criterion: things are abstract, if they are uniform, contain no variety, or are exactly alike. Judging from Leibniz's list, one can say—with one obvious exception—that uniformity pertains to spatial or corporeal extension, temporal extension, motion, or action. For example, an atom has uniform corporeal extension and vacuum, space, and geometrical objects have uniform spatial extension. Uniform duration pertains to a body at rest or in uniform motion; also, inactive faculties. Time has uniform temporal extension.

There is, as mentioned, one evident exception, namely, the case of things that are exactly alike. Even here Leibniz seems to have had in mind especially that if the *parts* of an extended entity are exactly alike, then the entity is abstract; but he also said explicitly that the prohibition against abstractions in nature precludes two substances that are exactly alike. We will not have understood why nature prohibits abstractions unless we understand why nature excludes all numerically different things that are indiscernible.

In other work from the period, as well as *New Essays*, Leibniz stressed that nothing with *continuous* extension occurs in nature.¹⁴ How is a uniform extension related to a continuous one? I take it that a thing has uniform extension if and only

if it has an extension that can be fully specified by a general formula or algorithm that characterizes all and only points within the extension, e.g. a recursive function, or a function on Cartesian co-ordinates.¹⁵ The uniform extension might or might not be continuous; i.e. it might, or might not, involve more points than there are in a densely ordered series. Leibniz presumably thought things like atoms and vacuum are both uniform and continuous, since they were generally supposed to have the structure of geometrical space.¹⁶ And in passages where he stated that space, time, and geometrical objects involve a continuum, he sometimes referred to continuous things as “uniform”.¹⁷ So he seems to have held that a continuous extension is uniform. But clearly he did not hold that all uniform things are continuous: two indiscernible substances are discrete, yet uniform by Leibniz’s standard; and some series of geometrical points are uniform but discontinuous.¹⁸ When Leibniz stated that uniform things are abstract, he meant all uniform entities, continuous or not.

Several passages in *New Essays* indicate that atoms, vacuum, inactive faculties, etc. *lack* something that things in nature *have*. The abstractions lack an internal structure of intrinsically different parts.¹⁹

Up to a point, Leibniz’s insistence that things in nature are composed of parts invokes tenets of seventeenth century mechanist theory, which had a certain grip on Locke and many of his contemporaries. Mechanism proposed to explain the physical qualities and causal powers of composite bodies, and to explain events that occur in them, by reducing them to the properties and powers of their constituent particles and their respective motions and collisions. The “reduction” was, speaking very roughly, a sort of mereological determinism; a collection of parts, their powers, and events in the parts give rise to and determine a composite, its powers, and events in it.²⁰ Leibniz maintained that atoms, e.g., subvert tenets of mechanist metaphysics. For an atom has shape, solidity, and position, but no internal parts that determine its shape, solidity, or position. Thus from the epistemic angle, an atom’s properties and powers have no explanation, as Leibniz argued in letters to Hartsoeker.²¹ In *New Essays*, he gave more attention to the metaphysical point that uniformly extended things have properties in the absence of a micro-structure that determines them. Unlike typical mechanists, Leibniz did not flinch from applying the mereological model to duration. Uniform time and duration are abstractions, just as uniform space and corporeal extension are. In nature, every duration is constituted and determined by intrinsically different parts.²²

Part of the basis on which Leibniz classified uniformly extended things as abstract is, then, that they have properties in the absence of structures sufficient to determine those properties. No problem in this, if they are abstract. But if such a thing existed

in concrete reality, its properties would be determined by, or dependent on, something other than it. Whereas in nature, the analogous properties are always dependent on the mereological structure of the extended thing.

3.

I want briefly to examine why abstractions are required for rational understanding, according to Leibniz. After deriding philosophers' fictions, Theophilus goes on to say that abstractions are indispensable for physical science:

Whereas abstraction is not an error as long as one knows that what one is pretending not to notice, is *there*. This is what mathematicians are doing when they ask us to consider perfect lines and uniform motions and other regular effects, although matter (i.e. the jumble of effects of the surrounding infinity) always provides some exception. This is done so as to separate one circumstance from another and, as far as we can, to trace effects back to their causes and to foresee some of their results (*suites*); the more care we take not to overlook any circumstance that we can control, the more closely practice corresponds to theory. NE 57²³

Leibniz's use of abstractions is strikingly opposed to the use of abstraction in Aristotelian method.²⁴ Aristotle maintained (against Plato) that all subjects of scientific knowledge exist in the actual world of substances and inherent accidents. The objects of mathematics do not have matter of the sort that corporeal things have, so they could be identified only by mental abstraction from corporeal substances and their other accidents. Jonathan Lear provides a helpful account of the logic of abstraction in Aristotle's philosophy of mathematics.²⁵ As he explains it, abstraction is the conception of a substance *qua* its accidents of quantity, e.g. the conception a particular body *qua*-triangle. Lear suggests such locutions have the logical form '*a qua*-F', where '*a*' stands for an individual substance and 'F' for an accident that inheres in that substance. The *qua*-operator is a predicate-filter that screens out some predicates applicable to the individual, *a*, and leaves others. Its use is restricted to the actual world, so the operator picks out (abstracts) accidents that actually inhere in at least one substance.

This is emphatically not the case for the abstractions Leibniz takes to be the subjects of mathematics and physics. They are not conceptions that separate some elements of actual things from others. A uniform extension is conceived with no micro-structure, and this makes it different in kind from the mereologically determined extensions of actual things, in Leibniz's view. Concrete extension is

constituted by endlessly many individually differentiated parts; in contrast, the idea of uniform or continuous extension involves notions of 'exact similarity', the 'infinite', and possibilities to be selected as one wants.²⁶ The gap is so great that the latter ideas must be innate in us, according to Leibniz. They cannot be extracted from the cognitive content of perception, for they are never found there and cannot be constructed from the ever diversified parts that are.²⁷

In addition, our passage suggests a further reason why rational understanding deals with subjects distinct from anything in nature. Abstraction is needed to "separate one circumstance from another," thereby to "trace effects back to their causes."²⁸ The properties of bodies are determined by efficient causes, as well as internal structure. When we assign the cause of an event, we consider a causally closed system of bodies; but this is to ignore the network of past and future causes and effects from which every event in nature is conceptually inseparable, in Leibniz's view.

Now Aristotle's method involves sifting through the jumble of surrounding factors to identify causes, e.g. the alignment of sun, earth and moon that causes lunar eclipse; but this is supposed to issue in discovery of a (universal) cause that actually exists. The theory is that abstraction enables us to bring our intellectual powers to bear on elements in the actual world, to isolate and describe (universal) components of it. In contrast, Leibniz maintained that science specifies events and causal relations that are strictly absent from concrete reality. In doing science, we conceive things that are uniform and separable, whereas everything in nature is irregular and infinitely connected. The logical subjects of mathematical and physical laws are not present in the actual world, which nevertheless they manage to govern.

The consequences of this Platonist view are very far reaching. It affects Leibniz's epistemology of demonstration and perception, his account of scientific explanation and the bearing of necessary truths on the actual, his theory of expression and law of continuity as they pertain to the concrete, and his account of substantial identity.²⁹ But for the purposes of this paper, the main point is that nature excludes, not just the subjects of laws, but more generally all things with intelligible definitions or distinct concepts. Nature is descriptively or conceptually holistic. Leibniz put this succinctly in a well known passage to De Volder (1701):

In my opinion there is nothing in the world of created substances which does not need, for its perfect concept, the concept of every other thing, since each thing involves [*influat*] the others in such a way that, supposing it did not exist or were otherwise, all things in the universe would be different from what they now are. G ii 226; L 524; Mates 219; also see NE 228

Since no element in concrete reality is conceptually separable from the rest, none can be distinctly conceived by a finite mind. Nevertheless we have perceptual cognition of the concrete. The content of perception is inevitably confused and mostly unavailable to consciousness, but by those devices it escapes being abstract.³⁰

4.

I want now to work for a while on the question why nature excludes abstractions; this will help to explain why it is conceptually holistic. Many texts indicate that what nature allows is restricted by some version of the principle of sufficient reason. In *New Essays*, this principle is applied primarily to powers of substances, such as gravitational attraction and thinking.³¹ The text vaguely suggests a broader principle: “. . . we are entitled to deny (within the natural order at least) whatever is absolutely unintelligible and inexplicable.”³² I am inclined to think that some properly clarified broad principle of intelligibility underlies the doctrine that nature precludes uniform entities.³³ But it is not the instrument Leibniz explicitly used against abstractions in the *New Essays* period. His explicit reasoning invokes a truncated principle of intrinsic foundations: an individual must have foundations specifically for its predicates of individual difference (numerical distinctness) and its concrete analogue of spatio-temporal position.³⁴

On the topic of individuation, Theophilus urges the familiar principle: every individual is distinguishable in itself from all others, otherwise there would be no individual distinctness.³⁵ He uses this doctrine to make a simple argument against atoms: any actual individual has intrinsic foundations for its numerical distinctness; atoms are unable to provide intrinsic foundations; so atoms do not exist.³⁶ This is superficial. The relevant principle of inner foundations needs to be clarified. More obvious, it is not clear that atoms are unable to provide intrinsic foundations, since it is possible that all atoms in the universe should differ in size and shape. Leibniz had a deeper argument.

Theophilus links individuation with (the concrete analogue of) spatio-temporal position. This connection was made by Locke, who urged that individuals of the same kind are individuated by the different times and places in which they exist. Theophilus agrees that every individual has a unique (concrete analogue of) spatio-temporal position although he denies that this is the basis of individuation: . . . [A]lthough diversity in things is accompanied by diversity of time and place, time and place do not constitute the core [*le precise*] of identity and diversity,

because they [sc. different times and places] bring with them different impressions in the thing [*ils amenent avec eux des impressions differentes sur la chose*]. To which it can be added that it is by means of things that we must distinguish one time or place from another, rather than *vice versa*; for times and places are in themselves perfectly alike, . . . NE 230

Elsewhere in *New Essays*, Leibniz argued that if space and time existed independently of things in them, as Locke, Newton, and others maintained, that fact would *not* explain what it is for things to have different positions. According to his opponents, an atom, e.g., has a position in space because the atom penetrates, or exactly coincides with, a part of space which exists independently of things that penetrate it; the atom inherits the position that belongs to the part of space it penetrates.³⁷ Leibniz urged that this account is useless, because it takes for granted the difference in parts of space that are intrinsically alike; moreover it takes for granted the relation between a body and the particular part of space it allegedly penetrates.³⁸ He concluded that the only positions ascribable to things are positions relative to other things; no position is indexed relative to time and space themselves.

This is not a direct attack on the existence of space and time independent of bodies, such as Leibniz made in reply to Clarke. While he clearly denied that space and time actually exist in *New Essays*, his focus was on the question what it is for numerically different individuals to have different positions. The relationalist answer supports the descriptive holism of nature. For Leibniz could agree (with some qualifications) with Locke's view that every actual individual has a unique (concrete) spatio-temporal position.³⁹ Given his relational theory, the position of any one thing just is its position relative to everything else that has one. So neither an individual nor its position can be identified without identifying its situation relative to everything else in the universe

In our passage, Theophilus states that different individuals occupy different times and places, but that brings with it more basic differences in the things themselves. They have different impressions that correspond to, and give rise to, their different relative positions. In *New Essays*, Leibniz used the term 'impression' to refer both to sensory impressions, which are cognitive modifications of souls, and to corporeal impressions, which occur in the organic bodies associated with souls and show effects of every motion that occurs in the universe.⁴⁰ Impressions appear to serve in both organic bodies and souls as intrinsic foundations for different (concrete analogues of) spatio-temporal position. Atoms are objectionable, because they lack modifications (impressions) that differentiate the positions they occupy.⁴¹

Given this doctrine of intrinsic foundations, atoms are inadequate to ground their

own durations and internal corporeal extensions. If an atom existed, it would need to have a different change of modification corresponding to each interval internal to its duration, and a different modification for each position within its perimeter. But as Leibniz said, atoms are “perfectly hard and perfectly unalterable” and not “continually changing in themselves”; they have no actual internal parts. In the same way, anything that has uniform extension is unable to give rise to positions interior to its boundaries, on Leibniz’s doctrine that diverse positions arise from diversity in things that hold them.

This does not exhaust the failings of uniformly extended things. We have yet to look at how well an atom, e.g., fares in the matter of differentiating its position relative to things outside its boundaries. Theophilus approaches this issue somewhat indirectly. To uncover Leibniz’s view of why atoms lack the appropriate internal foundations for their external positions, we need to probe the texts.

Leibniz’s thesis was that the places of any two individuals differ and this positional difference is due to intrinsic differences in the individuals themselves (their impressions). Other commentators, especially Benson Mates, Robert Adams, and Robert Sleigh, have been immensely helpful in clarifying Leibniz’s theory of the foundations of relations, in general. One question is how to understand Leibniz’s notion of a difference in the position of two things being “due to,” or “determined by,” the things themselves. Following the scholars mentioned, I understand it as follows: individuals *A* and *B* determine their relative position *P* iff *A* has some intrinsic property *f* and *B* has some intrinsic property *g* and (‘*A* is *f* and *B* is *g*’ is logically sufficient for ‘*A* has *P* relative to *B*’).⁴² Yet Leibniz’s idea seems to have involved a further, more metaphysical notion: that the position of *A* and *B* is derived from and explained by what they are in themselves.

Another question concerns what is to count as intrinsic. Mates and Adams have suggested linguistic criteria for intrinsic properties or denominations (i.e. concepts), approximately as follows: an intrinsic denomination can be expressed in a language without using any devices of reference, including the existential quantifier according to Mates.⁴³ While this is surely the right idea, Leibniz was directly concerned in our passages with metaphysical issues of dependence, or determination. What a thing is “in itself” contrasts with what it is in relation. If *A* is an actual individual, its numerical difference and position belong to *A* in relation and, according to Leibniz, are determined by intrinsic properties of *A* and its *relata*. In contrast, it is natural to understand that what *A* is in itself is not determined, in this sense, by any (finite) individual other than *A*. Instead, what a thing is in itself is metaphysically basic; other matters are determined by it. The rough idea is that *f*

is an intrinsic property of A just in case A is f , but A 's being f is not dependent on a metaphysical structure involving other (finite) individuals; somewhat more formally: the existence of A and its actual modifications, without the existence of any other finite individual, is sufficient to make ' A is f ' true.⁴⁴

A final matter needs to be cleared up. Leibniz held a sort of global thesis: the existence of all (and only) the individuals in the universe, together with their intrinsic properties, determines the relative position of each individual. Did he think that if an individual x coexists with other individuals, *their* intrinsic properties determine x 's position relative to them, i.e. x 's properties have no say with regard to x 's position in certain respects? Or, alternatively, did Leibniz think that x 's properties have a role determining all aspects of its position, no aspect depending entirely on individuals other than x ? This question is similar to one raised by Sleight concerning "weak" and "strong" theses of intrinsic foundations for all properties of substances;⁴⁵ although Sleight suggests Leibniz favored the weak thesis in an earlier period, I maintain he held something roughly like the strong thesis in *New Essays* where his attention was focused on mutual position. He classified this as a "relation of concurrence" as opposed to a "relation of comparison."⁴⁶

To help make the point, I want briefly to look at a somewhat analogous global thesis involving a jigsaw puzzle. Consider a collection of all and only jigsaw pieces that have a unique solution. The pieces in the collection satisfy a certain global thesis. They jointly determine the position each has to all the others in the puzzle's solution. But the contribution of any single piece to determining their mutual order is very limited; one piece places some constraints on the shapes of its immediate neighbor(s), but does not fully constrain their shapes or their number and does not at all constrain the shapes, number, or relative positions of more distant pieces. We might say that a single piece is neutral with regard to what pieces are in the collection and the position it has relative to them. The crucial point is: for any piece p in this collection, the position p is globally determined to have can change, depending on the other pieces with which p is taken.

Of course this is not perfectly analogous to the situation described by Leibniz's global thesis. Perhaps the most important disanalogy is that the puzzle has nothing more than a conditional spatial arrangement: the pieces determine their mutual positions *if* the puzzle is solved. Leibniz's thesis states that the intrinsic properties of things in the universe jointly determine the mutual positions they actually have. The claim for which I want to argue is this: Leibniz's view of internal foundations is thicker than the situation illustrated by the jigsaw puzzle. For Leibniz, each thing in the universe has properties that constrain its position relative to each other thing

in the universe. Unlike a piece in a puzzle, an actual individual *A* cannot be supposed to hold different jointly determined positions depending on the other things with which *A* is supposed to coexist.

The text of the *New Essays* favors the view that Leibniz held this thick sort of global thesis. Consider the following speech in which Theophilus returns again to the comparison of atoms and actual things:

... place and time, far from being determinants by themselves, must themselves be determined by the things they contain. The most important point in this is that identity involves infinity, and only someone who is capable of grasping the infinite could know the principle of individuation of a given thing. This arises from the influence—properly understood—that all the things in the universe have on one another. The case would be otherwise, it is true, if the atoms of Democritus existed, but then there would be no *difference* between two *different* individuals with the same shape and size. NE 289-90

Atoms are said to be inadequate here, because their modifications are not sufficiently complex to show the “influence” of all things. (Two atoms alike merely in size and shape are exactly alike.) As a result, atoms cannot determine their mutual positions, nor their individual differences. Thus the non-atomic individuals that are in the universe succeed in determining their relative positions only if (because) each individual *does* show the influence of every other. No individual is neutral with regard to any other individual with which it coexists. My question is whether the influences an individual’s modifications show are limited to the very individuals that coexist with it. The passage suggests that they are.

Other passages in *New Essays* also indicate that the modifications in a substance that underlie its relations to other things are tailored to those things in particular: “... every substantial thing, be it soul or body, has a relation to each of the other things that is proper to it [*a son rapport a chacune des autres qui luy est propre*]; and the one must differ from the other by intrinsic denominations.”⁴⁷ Part of the point here is that actual things have intrinsic modifications that jointly determine their mutual positions (hence individual differences). Another part of the point is that the position each thing has relative to each other thing is proper to that thing, i.e. peculiar to it as opposed to any other possible thing. Consider two actual substances *A* and *B* and their mutual position. On a thin global thesis, some substance other than *A* could have the very same position relative to *B*, and that position could be globally determined by intrinsic foundations. (This would be like the jigsaw case.) On the contrary, the passage says that *A*’s position relative to *B* is proper to *A*.⁴⁸

Consider also the following passage from Leibniz's first published reply to Bayle (1702):

The soul. . . involves. . . a multitude of present thoughts, each of which tends to a particular change according to what it involves and what is found in it, at the time, by virtue of its essential relationship to all the other things in the world. Among other things, it is also their lack of this relationship which bans the atoms of Epicurus from nature. For each thing or part of the universe must point to (*marquer*) all the others, in such a way that the soul, with regard to the variety of its modifications, is to be compared with the universe which it represents according to its point of view . . . G iv, 562; L 579 (slightly modified)

Here atoms are excluded from nature, because they lack modifications that "point to" all things in the universe. Here again, the difficulty with atoms implies a necessary condition for things that do globally determine their positions or points of view: each is required to have modifications that point to everything else. And here it is explicit that these modifications *essentially* point to all and only the things that coexist with it.⁴⁹ Because a substance cannot point to any thing other than it does, it cannot jointly determine a position in conjunction with anything other than it does. This is a thick global thesis of intrinsic foundations for mutual position.

5.

It is now clear that nature demands intrinsic properties that are absent from things with uniform extension of any sort. But this is rather hollow, unless we can see what nature accomplishes by this demand. Two questions are especially pertinent: first, what sort of substance is suitable to have modifications that contribute to the joint determination of the mutual positions of things? second, how do substances manage jointly to determine their mutual positions on the basis of nothing but their intrinsic properties?

First, then, what must an individual substance be like, if its modifications provide intrinsic foundations for global determination of its position? Texts we have examined indicate that it must have modifications with representational content that specifies the entire universe from its position or point of view; each points to the others, shows their influence, or perceives them. As we saw, Leibniz ascribed representational content to modifications of corporeal substances (impressions), as well as immaterial souls and entelechies. But one might think he had grounds to argue that the ultimate bearers of intrinsic foundations for mutual position *must* be immaterial, since any extended thing presupposes the order among its parts. It is not

clear to me just how such an argument might go; it would require premises in addition to the thesis that relative positions have intrinsic foundations. A likely candidate is the mereological thesis: a whole depends upon and is determined by its parts. The rough idea would be that foundations for the position of an extended thing must always be sought in its parts, but cannot be found there because its parts are endless. So foundations for extension must be sought in things that have neither extension nor position. Leibniz did not make exactly this argument although there may be one very like it in *New Essays*.⁵⁰ In any case, he clearly maintained that modifications of immaterial substances are the ultimate internal foundations for relative position.

We have yet to see how substances manage to determine a concrete analogue of spatio-temporal order on the basis of nothing but their intrinsic properties. The question is much too large to consider in any depth, but here is a brief sketch of what I take to be the answer. The central doctrine is that each individual substance represents the universe from its point of view. The key unspoken premise is, I think, that representation has both intensional and extensional aspects. In effect, Leibniz understood his central doctrine to comprise two claims. (i) The modifications of each substance have an intensional content *fixed without reference* to anything that coexists with it.⁵¹ It is essential to the modifications that they have this intensional content, but not that it be true. (ii) The intensional content of a substance's modifications is true, however, because of the things that coexist with it. Claims (i) and (ii) reconcile two doctrines that may seem in tension, the claim that individuals have intrinsic properties and the doctrine of conceptual holism. Properties defined in terms of intensional content are intrinsic to a substance (independent of the existence of other finite things), and yet they are conceptually inseparable from everything in the universe on the assumption that the universe includes all and only things the properties intensionally specify.

Claim (i) raises extremely difficult issues regarding intensional representation, and I cannot consider them here.⁵² Claim (ii) is the immediate concern. How can the existence of individuals and their modifications make it true that they have an analogue of spatio-temporal order? Consider, again, the central doctrine: each individual substance represents the universe from its point of view. As far as *intensional* representation goes, this implies a high degree of "inter-representational agreement": each substance has modifications that intensionally specify a universe that is exactly the same as that specified by the modifications of every other at least in certain respects: number of individuals (including itself), distribution of modifications over these individuals, and mutual order of individuals having the

same modifications. (Keep in mind that souls and entelechies are perceived by means of the purposive movements of their organic bodies.) The doctrine that each substance represents *the* universe also implies that what each represents actually exists. Call this the thesis of “extra-representational correspondence”: the number of individuals in the universe and distribution of modifications over them is exactly the same as the number of individuals and distribution of modifications intensionally specified by the modifications of each actual individual. Notice that this correspondence thesis does *not* state that individuals in the universe actually have a mutual order that corresponds to the order each intensionally specifies. We are, after all, engaged in explaining how things are supposed to *acquire* their mutual order.

The solution surely lies in Leibniz’s doctrines that concrete analogues of spatio-temporal positions are relations and that relations, while founded in individuals, have their reality primarily in the understanding of God.⁵³ I suggest Leibniz thought the two theses just stated are logically sufficient for the reality of a mutual order among substances and thereby among all individuals, i.e. sufficient for the order to be in God’s understanding. Grant that there is complete *inter*-representational agreement (in regard to number of individuals, distribution of modifications, and mutual order) and grant that there is complete *extra*-representational correspondence (in regard to number of simple substances and distribution of modifications); I suggest that it follows, according to Leibniz, that those individuals actually have the mutual order their modifications intensionally specify. (This is not to say the two theses are logically necessary for spatio-temporal relations, on Leibniz’s view, but necessary for natural ones.) On the account I am suggesting, the reality of the mutual order in nature is half-phenomenalist and half-realist. What makes the order real is that each substance represents things *as they are* with regard to the existence of simple substances and their modifications and that each substance represents things just *as every other* substance does with regard to the mutual order.

This account is recommended by the fact that it is apparently required to complete Leibniz’s theory of intrinsic foundations of the concrete analogue of spatio-temporal position. But it is also broadly supported by texts. I say “broadly,” because the texts do not explicitly mention position, but rather address the reality of things that have mutual position: matter and motion.

Several passages in *New Essays* lend this sort of support,⁵⁴ but the following carefully drafted one is the most important:

However, although relations are the work of the understanding they are not baseless and unreal. The primordial understanding is the source of things; and

the very reality of all things other than simple substances consists only in there being a foundation for the perceptions or phenomena of simple substances. NE 145.

Here we learn that simple substances and their perceptions provide the foundations for those same perceptions, i.e. they make the phenomena or content of the perceptions real.

To the extent that the content of perceptions specifies simple substances and their modifications (i.e. perceptions) their content is real because it corresponds to things *as they are*. But the content of perceptions specifies substances through images that specify something else: matter, motion, a mutual order. The passage just quoted indicates that the reality of this aspect of the content of perceptions consists of nothing but the content of perceptions, i.e. the fact that in these aspects of content, the perceptions of all substances agree.⁵⁵

How, then, do actual things manage to determine their mutual order? The global thesis works because it is supplemented by further doctrines: substances have modifications with intensional content, the two theses of complete representational agreement and correspondence, and the half-phenomenalist-half-realist account of sufficient conditions for things to have mutual order. Why does nature exclude uniformly extended things? In nature, the concrete analogue of spatio-temporal order is determined by nothing but substances and their intrinsic properties, i.e. properties that depend on no finite thing other than the substance that has them. But uniformly extended things can neither found an order, as immaterial substances do, nor hold a place in it, as natural bodies do. If they existed, they would presumably have a spatio-temporal order, but it would have to come from an extra-natural source. Since nature needs nothing extra-natural, it excludes such things.

One of my questions is: what is it for an entity to be abstract? Here is a partial account: an entity is abstract, if it does not intensionally specify its position relative to all things with which it would coexist, if it existed.

This allows us to see roughly why Leibniz held that things that are exactly alike are abstract, why all non-identical, but indiscernible, individuals are barred from nature. It is because they are unable to represent everything else in the universe. In particular, each is unable to represent the other. If two simple substances were exactly alike, there would be no difference between the representation one has of itself (its point of view) and any representation it might have of its twin (same point of view). So the pair of indiscernible substances is abstract, by our criterion.

6.

I want to close with a brief reflection on the broad metaphysical character of this “nominalist” argument. Leibniz’s stand on what nature allows is linked with Platonic views: by excluding the subjects of laws of nature from concrete reality, he excluded universals and the objects of rational knowledge from a domain where Aristotle placed them. But there is a further Platonic cast to Leibniz’s notion of nature. Plato argued, roughly, that sensibles elude predication. If one tries to say what a sensible is, e.g. a man, this has to be qualified relative to a time, place, way of being, point of view; thus the sensible thing is equally well said not to be a man relative to some times, places, ways of being, points of view.⁵⁶ In *New Essays*, Leibniz’s account of material things preserves much of this picture. Material things are specified from a point of view; they are only in relation to other things (parts, causes); they constantly change, or cease to be what they are; and they are real, only in a way, since their reality depends on immaterial substances.

In making the material realm dependent on perceiving immaterial substances, Leibniz departed from Plato. The “nominalist” argument governs both substances and the material. Its driving principle is that simple substances and everything that depends on them are concrete, not abstract. What is it to be concrete? First, an individual is concrete, only if its properties specify its position in relation to everything else, hence conceptual holism. Second, a substance is concrete, only if some of its denominations are intrinsic. For if there is nothing a substance is in itself, and it is only in relation to other things, then it is, in itself, incomplete or abstract. Both properties intrinsic to substances and conceptual holism are required by Leibniz’s notion of the concrete. Yet the two can seem inconsistent: how can a substance have properties that are independent of other finite things and yet are conceptually inseparable from them? The trick must be done by the precise nature of its intrinsic properties. Leibniz did it, I have argued, by positing properties that are representations with intensional and extensional content. This, in turn, underwrites his account of how extended material things, which are only in relation and in a way, come to have a sort of ambiguous reality in a world of immaterial substances. If this is correct, the anti-abstractionist argument of *New Essays* defies classification, but it has at least as much in common with Platonic views as nominalist ones.

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NOTES

¹This is a slightly revised version of a paper read to the Leibniz Society in December, 1995. It is based on material in a much longer work in progress dealing with some main issues in *New Essays* and Locke's *Essay*. I hope to elicit comments from the community of Leibniz scholars by sharing some of this material at this stage. Please note that important parts of the "nominalist" program are not discussed in this paper for reasons of space. Also some significant implications of the program could not be pursued here. Thanks are due to discussants at the Leibniz Society meeting, especially Bob Adams, Richard Arthur, Jim Clerselier, Glenn Hartz, Don Rutherford. Thanks also for helpful comments from the editor of the *Review*, Glenn Hartz, and from Paul Lodge.

²See NE 378-9.

³E.g. letters to De Volder from 1703, G ii 249-50; L 529; from 1705 or '06, G ii 277; AG 183; *Discourse*, sec. 8; LA 38f, 49ff, 99, 101.

⁴Massimo Mugnai, "Leibniz's Nominalism and the Reality of Ideas in the Mind of God," in Heinekamp, Lenzen, and Schneider, eds. *Mathesis rationis*; Fabrizio Mondadori, "Modalities, Representations, Leibniz's Nominalisms" in *Proceedings of the International Leibniz Congress*, Madrid, 1989.

⁵Berkeley argued that the abstract idea of a triangle, e.g., is defined by a logical contradiction, since it is a triangle, but has, e.g., neither equal sides nor unequal sides, whereas every triangle has either one or the other (see *Principles*, Introduction, sec. 11). For a contemporary discussion of this objection specifically regarding Aristotelian uses of abstraction, see Kit Fine, *Reasoning with Arbitrary Objects* (Oxford: Basil Blackwell, 1985).

⁶In letters to De Volder, Leibniz tended to say that continuous things (which form a proper subset of those classed as abstract in NE) are not "actual" or "real": (G ii 268-9 (L 535-6); G ii 282 (L 539); G ii 278-9 (Rus 245); in reply to Bayle, he said such things are excluded from "nature": G iv 568 (L 583).

⁷See Leibniz's reply to Bayle (1702) G iv 568-9; L 583; letter to Princess Sophie (1705) G vii 564.

⁸See NE 65-6, 110, 378-9, 381-2.

⁹See NE 145. Leibniz wrote to De Volder (1706): "For there can be nothing real in nature except simple substances and the aggregates resulting from them. But in the simple substances themselves we know nothing besides perceptions or the reasons for them." G ii 282; L 539. In their informative article "Space, Time and the Leibnizian Metaphysic," *Noûs* 22 (1988), pp. 493-519, Glenn Hartz and Jan

Cover suggest that in a period that includes that of *New Essays*, Leibniz recognized three metaphysical levels: monadic, phenomenal, and ideal. Leibniz does maintain a sharp distinction between ideal entities and natural ones in the texts that concern me; but nature cannot be consigned entirely to the monadic or the phenomenal, as long as these two levels are supposed to be mutually exclusive.

¹⁰Don Rutherford calls attention to the difference between these two principles in "Leibniz's Principle of Intelligibility," *History of Philosophy Quarterly* 9 (1992), pp.35-50.

¹¹Benson Mates, *The Philosophy of Leibniz* (Oxford: Oxford University Press, 1986) pp. 171-3; also see Robert C. Sleigh, *Leibniz and Arnauld* (New Haven: Yale University Press, 1990) p. 54. Robert Adams, in *Leibniz: Determinist, Theist, Idealist* (Oxford: Oxford University Press, 1994), pp. 227-8, briefly mentions Leibniz's view that scientific theory deals with abstractions, but does not note the difference between dispensable and indispensable abstractions.

¹²See NE 217, 218, 179. In effect, these are Aristotelian abstractions.

¹³Also see letters to De Volder from 1701, G ii 225; L 524; from 1703, G ii 249-50; L 529.

¹⁴See e.g. the many passages collected in Hartz and Cover.

¹⁵A 'general' formula expresses a property or relation that can belong to many individuals. The idea is that a non-uniform extension incorporates points all of which cannot be specified by the same formula. Leibniz repeatedly said that a uniform extension is "the same"—presumably in all its regions and all points it incorporates. This implies that it can be defined by a formula that not only holds for all and only points comprised by the extension, but also is a unitary formula. The relevant notion of unity is fairly clear at the intuitive level, but I will not try to be more precise about it here.

¹⁶See Locke, *Essay* II, xxiii, 31; IV, iii, 29 ; this is true on any theory on which material things penetrate (overlap) regions of geometrical space and change overlaps time. Those who agreed with Aristotle and Descartes in rejecting penetrable empty space nevertheless supposed that geometrical properties are instantiated by material substances.

¹⁷E.g. NE 149, 152, 385; also Leibniz's reply to Bayle (1705): "The inclusion of the possible with the existent makes a continuity which is uniform and indifferent to every division." G iv, 568; L 583. Also letter to Princess Sophie (1705): "Uniformly ordered continuity. . . is nothing but supposition and abstraction. . ." G vii 564.

¹⁸E.g. the function on Cartesian coordinates $x=y$, restricted to values of x and y that are integers.

¹⁹See NE 57, 110; also: "I think that the extended has a unity only in an abstract sense, namely, when we leave out of consideration the internal motion of the parts, for each part of matter is itself subdivided further into actually different parts; nor are the parts of matter different only in their modes, if they are distinguishable from each other by the souls and entelechies which subsist always." To De Volder (1699), G ii 170; L 516.

²⁰I discuss the nature of this "reduction" and differences between versions endorsed by Leibniz and favored by Locke in "Locke, Leibniz and the Mechanist's Dilemma."

²¹E.g. "It is easy to make up fictions, but difficult to make them reasonable, i.e. to show that they have, or at least could have, a reason. Atoms are one such fiction; a first element that is perfectly fluid is another. Perfect fluidity is as unreasonable as perfect hardness. There is no such thing in nature, . . ." To Hartsoecker, G iii 506; also see 519, 527, 532.

²²Leibniz wrote to De Volder (1705): "In real things ... units are prior to the multitude, and the multitudes exist only through units. (The same holds of changes, which are not really continuous.)" G ii 278-9 (Rus 245). Also NE 155. Also: "And one could also conclude that the duration of things, or the multitude of momentary states, is the mass of an infinity of bursts (*d'eclats*) of God, of which each at each instant is a creation or reproduction of all things, having no continual passage, properly speaking, from one state to the next." To Princess Sophie (1705) G vii 564.

²³Also: "The result of this very great multitude of infinite compositions is that we are finally lost and are forced to stop in our application of metaphysical principles, and of mathematical ones as well, to physics." Reply to Bayle (1702) G iv 569; L 583; also letter to De Volder (1703), G ii 252-3; L 531.

²⁴For a helpful discussion of diverse notions of abstraction, including Aristotelian abstraction, see Nancy Cartwright and Henry Mendell, "What Makes Physics' Objects Abstract?" in *Science and Reality*, ed. James T. Cushing, C. F. Delaney, and Gary M. Gutting (Notre Dame, IN: Univ. of Notre Dame Press, 1984), pp. 134-52. Also of interest, E. J. Lowe, "The Metaphysics of Abstract Objects," *Journal of Philosophy* 92 (1995).

²⁵Jonathan Lear, "Aristotle's Philosophy of Mathematics," *Philosophical Review* 91 (1982), pp. 161-92.

²⁶E.g. "... anything which is continuous [such as geometrical figures] involves an infinity, from which selections must be made." NE 385 Also: "The true infinite,

strictly speaking, is only in the *absolute*, which precedes all composition and is not formed by the addition of parts.” NE 157

²⁷E.g. “Our perceptions never provide a sufficiently constant and regular train to correspond to the passage of time, which is a simple and uniform continuum like a straight line.” NE 152 Again: “Accordingly the thought of the infinite comes from the thought of likeness, or of the same principle, and it has the same origin as do universal necessary truths. That shows how our ability to carry through the conception of this idea comes from something within us, and could not come from sense experience; . . .” NE 158 Again: “. . . the idea of the infinite, above all, is not formed by extending finite ideas.” NE 225; also 157. This is entirely consistent with remarks to the effect that experience is necessary if we are to notice ideas that are innate and to form certain thoughts that utilize them, e.g. NE 110, 111, 77, 80, 81, 154.

²⁸Leibniz repeated the argument that abstraction is necessary for scientific understanding in a letter to De Volder (1703). “But in phenomena or aggregates every new change arises from an impact according to laws prescribed partly by metaphysics, partly by geometry; for abstractions are necessary for the scientific explanation of things. Hence we regard the individual parts within a mass as incomplete, and each as contributing its part, but completed only by the combination of all. So any body whatever taken by itself, is understood to strive in the direction of a tangent, though its continuous motion in a curve may follow from the impressions of other bodies. . . . For there is as great a difference between substance and mass as there is between complete things as they are in themselves and incomplete things as we accept them through abstraction. It is by means of this abstraction that we can define in phenomena the role to be ascribed to each part of mass and can distinguish and explain the whole phenomenon rationally--a thing which necessarily requires abstractions.” G ii 252-3; L 531 This may seem to indicate that phenomena harbor the abstractions required for physical science, but I would argue not. The passage does not say that bodies, as they are in nature, are incomplete. Rather it is when we regard bodies as distinct elements in a system of interacting bodies that we are said to resort to abstractions. A source of possible misreading is that the passage makes two contrasts: one between monads, which don’t interact causally, and the mass of bodies (phenomena), which do; another between the phenomena, which are complete, and abstractions, which are required to delineate separate subjects of causal relations. It would be a mistake to conflate the two contrasts, as if Leibniz meant that monads are complete and phenomena, i.e. the causal nexus of interacting bodies, abstract.

²⁹These matters are discussed in the study of *Essay* and *New Essays* that is underway.

³⁰E.g. “But only the supreme Reason, who overlooks nothing, can distinctly grasp the entire infinite and see all the causes and all the results (*suites*). All we can do with infinities is to know them confusedly and at least to know distinctly that they are there. . .” NE 57. Also: “These minute perceptions. . . [are] impressions which are made on us by the bodies around us and which involve the infinite; that connection that each being has with all the rest of the universe.” NE 55; also see NE 289. Again: “. . . confused perceptions include all external things and contain an infinity of relations. . .” Reply to Bayle (1702), G iv 565; L 581. On the difference between perception and awareness, see e.g. NE 134. It follows, once again, that the subjects of theoretical knowledge are innate ideas, rather than components of the content of sense perception.

³¹See NE 65-7, 379, 381-2.

³²NE 65. Compare the somewhat earlier “Specimen Dynamicum” (1695): “I think there is no natural truth in things for which we must find the reason in the divine will but that God has always put into things themselves some properties by which all their predicates can be explained.” GM vi, 242; L 441 (quoted by Rutherford)

³³See NE 230f; we are not told what the relevant canon of reason is.

³⁴Glenn Hartz has convinced me that it is misleading to refer to the relative positions of concrete individuals as “spatial or ‘temporal,’” since they are not in space and time. Leibniz held that space and time are orders of possible individuals including actual individuals considered as possible (e.g. NE 149, 154, 155). But it is more accurate to say that there is an analogy between abstract spatial and temporal position and the positions that constitute (concrete) corporeal extensions and durations. The basis of the analogy is discussed in the study of NE underway.

³⁵NE 110.

³⁶NE 230f.

³⁷In fact, this is not the account of spatial position given by Locke; see *Essav* II, xiii, 2, etc.

³⁸See NE 127.

³⁹In addition to the qualification on “position in space and time,” Leibniz needed to explicate the suggestion that souls have positions in the array of bodies and bodily events: “Phil. What spirits have to do with space, or how they participate [*participent*, Coste’s translation of Locke’s “communicate”] in it, we know not. But we do know that they participate in duration. Theo. Every finite spirit is always joined to an organic body, and represents other bodies to itself by their relation to

its own body. Thus their relation to space is as manifest as that of bodies [*aussi manifeste aue celuy des corps*].” (NE 155; the last sentence is mistranslated by Remnant and Bennett.) Also see to De Volder, from 1703, G ii 253; L 531. Glenn Hartz has pressed me to clarify how I understand these passages. I take it a soul has a cognitive position (point of view), i.e. it perceptually knows bodies and corporeal events in an order based on its immediate perception of its own body and bodily events. A cognitive position with regard to the corporeal order is a different type of entity than a position in the corporeal order. But a soul’s cognitive position is specified and individuated by the corporeal position of its body. The position of its body has a foundation in the intrinsic properties of the soul (and those of other immaterial substances); see below. In light of all this, an immaterial substance can be vicariously assigned a position in the corporeal order, on the basis of the position of its body for which it provides foundations. It is often convenient to speak of the substance as having “position” or “place” without explaining all of this (see e.g. NE 221).

⁴⁰See NE 55, 111, 116, 117, 133, 140.

⁴¹Leibniz wrote to De Volder (1702): “. . .what can be conceived by itself alone cannot be located in space. To be in a place is not a bare extrinsic denomination; indeed, there is no denomination so extrinsic that it does not have an intrinsic denomination as its basis. This is itself one of my important doctrines.” G ii 239-40; L 526-7

⁴²See Mates, pp. 215ff; also Sleigh, p. 76. With regard to this sort of formulation, it should be stipulated that neither ‘A is *f*’ nor ‘B is *g*’, taken alone, is logically sufficient for ‘A has *P* relative to *B*’.

⁴³Mates, p. 218; Robert Adams, “Primitive Thisness and Primitive Identity,” *Journal of Philosophy* 76 (1979), p. 7.

⁴⁴Thanks to an anonymous referee for calling attention to a difficulty with an earlier formulation.

⁴⁵Sleigh, pp. 74-5. As I understand it, however, what Sleigh calls the “weak” thesis of intrinsic foundations is a global claim, but the “strong” thesis is not. Both theses with which I am concerned here are claims with regard to what is determined by all and only the individual substances in the universe.

⁴⁶Relations of concurrence “involve some *connection*, such as that of cause and effect, whole and parts, position and order, etc.,” whereas relations of comparison involve equality or inequality, e.g. ‘taller than’, ‘similar to’. See NE 142.

⁴⁷NE 110. The passage is ambiguous as between (a) each individual *A* has a relation to every other individual that is proper to *A*, and (b) each individual has a relation

to every other individual that is proper to that other individual. For present purposes, no important issue depends upon resolving this ambiguity.

⁴⁸Also see NE 227.

⁴⁹I maintain Leibniz held that for any two actual substances with their modifications, it is logically possible that one should exist and the other not. (See note 42.) I understand this passage to mean that each individual has modifications that essentially point to exactly the individuals in the actual world if they succeed in pointing to anything at all.

⁵⁰NE 376. The argument is considered in my longer discussion of NE.

⁵¹Thus intensional content is not fixed by causal chains, the causes of mental states, constant conjunction, or pre-established harmony among actual things.

⁵²Mark Kulstad has brought out several puzzles about Leibniz's view of expression in general and perception in particular in "Leibniz's Conception of Expression," *Studia Leibnitiana* (1977), pp. 55-76 and "Some Difficulties in Leibniz's Definition of Perception" in *Leibniz: Critical and Interpretive Essays*, ed. Michael Hooker (Minneapolis: University of Minnesota Press, 1982), pp. 65-78.

⁵³NE 145, 265.

⁵⁴"As for motion: it has only phenomenal reality, because it belongs to matter or mass, which is not strictly speaking a substance. Still, there is an image (*un image*) of action in motion, as there is an image of substance in mass." NE 211 Also "... the truth about sensible things consists only in linking together of phenomena. . . (for which there must be a reason). . . ; but that the truth about our existence and about the cause of phenomena is of a different order, since it establishes [the existence of] substances; . . ." NE 374; also 378, 226.

⁵⁵Leibniz typically did not note the difference between agreement among perceptions and their correspondence with reality, but rather used locutions that can be understood to refer to both. Well known passages from the De Volder correspondence include: "And if anyone concedes to me that there is an infinity of percipients, in each of whom there is a fixed law of the progression of phenomena, that the phenomena of these different percipients correspond [*conspirare*] with each other, and that there is a common reason for both their existence and their correspondence [*conspirationis*] in the thing which we call God, this is all that I claim in the matter, and all that I think can be claimed." (1704) G ii 264 (L 535) Also "... there is nothing in the world except simple substances and, in them, perception and appetite. Matter and motion, however, are not so much substances or things as they are the phenomena of percipient beings, whose reality is located in the harmony [*harmonia*] of the percipient with himself (at different times) and with other percipient beings."

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(1704); G ii 270 (L 537).

⁵⁶*Phaedo* 74aff; *Republic* 479a; especially *Symposium* 211a.