

COMPOSITE SUBSTANCES AS TRUE WHOLES:

*TOWARD A MODIFIED NYĀYA-VAIŚEṢIKA THEORY OF COMPOSITE
SUBSTANCES*

In the *Categories* Aristotle defined substance as that which is neither predicable of nor in another.¹ In saying that a substance is not predicable of another, Aristotle meant to exclude genera and species from the category substance.² A man is a substance but not *man*. In saying that a substance is not in another, Aristotle meant to exclude property particulars from the category. A *man* is a substance, not his *color*.³

The *Categories* treats substances as simples. Though a particular substance, Bucephalus the horse, has parts, it is nevertheless a *single* entity in the category substance and, hence, incomplex in the way a black thing or a running man are not.⁴ Black things and runners are complex because they are aggregates of substances and property particulars. Even if a horse is *one* substance and, thus, *an* entity unlike a substance *cum* some of its attributes or a group of related substances, a horse is made of parts and one may wonder *how* it is related to its parts, as well as how *its being made of parts* coheres with the definition of substance given in the *Categories*. The *Categories* does not tell us how a complex substance is related to its parts; it only tells us that its parts are not *in* it in the way its properties are.⁵ This makes sense; while the particular properties of a horse ontologically depend on it, *it* would seem ontologically dependent on its parts. If that is

the case it is hard to see how a horse could be a substance, if a substance is neither predicable of nor *in* another (or *others*).

It is well known that Aristotle tried to solve the problem of how composite substances are true unities in such works as the *Physics* and the *Metaphysics*. Aristotle's proposed solution to the problem of how his definition of substance allows that composites exist is fascinating, as are later interpretations of it. However, we will not pursue any of these solutions. Instead we will explore a theory of composite substances which is based on a different definition of substance from Aristotle's. This theory was worked out over many centuries by philosophers of the **Nyāya-Vaiśeṣika** school, one of the "orthodox" schools of Indian thought.⁶ We shall argue in this paper that the **Nyāya-Vaiśeṣika** theory of substance is plausible in itself, provides clear criteria for distinguishing substances from non-substances, and poses no problems in principle for accepting the existence of composite substances. We think that these features of their theory give it advantages over Aristotle's. Common sense holds that, if there are substances, such things as trees and cats are, but it also holds that such things are not only composite substances but are made of other *substances*. It is this last intuition which Aristotle's definition of substance seems to deny and, for this reason, we believe that a theory of substances that allows that some substances are made out of other substances has certain *prima facie* advantages over Aristotle's.

Every metaphysical theory is beset with difficulties, so it will come as no surprise that this holds of the **Nyāya-Vaiśeṣika** theory of composite substances. In this paper we do not have the space to pursue all the difficulties which beset that theory and will concentrate on the one we think gravest. It is that the **Nyāya-Vaiśeṣika** theory entails

that no composite substance *in fact* endures for more than a few moments. Since the intuition that at least some composites endure for quite a length of time is at least roughly as strong as the intuitions that there *are* composites and that they are *made of other substances*, we believe that this entailment of the Nyāya-Vaiśeṣika theory of composites is quite grave, perhaps as grave as those that face any Aristotelian theory of them. Fortunately, however, the Nyāya-Vaiśeṣika theory can be modified in such a way that it does not have this entailment, yet retains its advantages over Aristotle's. The main aim of this paper is to develop this modification and to support the truth of the following conditional: *If there are composite substances, then the modified Nyāya-Vaiśeṣika theory of their nature is a plausible account of what they are and of how they are related to their parts.*

A secondary aim of this paper is to better acquaint contemporary philosophers with some of the central concepts and arguments of the Nyāya-Vaiśeṣika tradition. We hope that our exposition of these will convince readers of the worthiness of this aim.

I The Nyāya-Vaiśeṣika Theory of Composite Substances

The Nyāya-Vaiśeṣikas of ancient and medieval India developed an integrated philosophical system that includes epistemology, formal logic, philosophy of language, ethics, and metaphysics.⁷ This system developed over centuries and exhibits a thoroughness and order that rivals that of the medieval European scholastics. Though we cannot do justice to it here, we hope to shed light on the power it has to suggest solutions

to some old problems concerning the composition and endurance of composite substances. Our focus is philosophical rather than exegetical or historical. Specifically, we focus on the philosophical strengths of the theory of composite substances that our study of Nyāya-Vaiśeṣika metaphysics has suggested, rather than on the accuracy of our interpretation of it or on the ways it changed over time.

In explicating the Nyāya-Vaiśeṣika theory of composite substances, we begin by explicating its theory of categories. In order to do that we think it best to start with an explication of the Nyāya-Vaiśeṣika category inherence.

1. The Category Inherence

Inherence is one of the six fundamental ontological categories recognized by the seminal Nyāya-Vaiśeṣika thinker Praśastapāda (500s A.D.), and by nearly all Nyāya-Vaiśeṣika philosophers after him.⁸ These categories are substance, quality, motion, universal, individuator, and inherence (absence was added later).⁹ Each of these categories was posited by the Nyāya-Vaiśeṣikas in order to account for the truth of propositions.¹⁰ Their category theory can be understood as an attempt to exhaustively enumerate the sorts of things we must posit as truthmakers for propositions.¹¹ Things are often said by the Nyāya-Vaiśeṣikas to be the loci of other things.¹² A rose is said to be the locus of a certain quality, a certain *red*. *This* red is said to inhere in *this* rose. There are several entities in different categories the Nyāya-Vaiśeṣikas thought must be posited to account for the truth of the claim “This red is in this rose,” and each one corresponds to a grammatical part of it. “This red” corresponds to an actually existent

property particular; “this rose” corresponds to an actually existent substance; “is in” corresponds to the relation of inherence between the red and the rose.¹³

In the Nyāya-Vaiśeṣika system, inherence is conceptually prior to all the other categories, though this was first made explicit by Udayana (1000s A.D.),¹⁴ who is commonly held to be the greatest Nyāya-Vaiśeṣika philosopher.¹⁵ In his work on Nyāya-Vaiśeṣika ontology, *Lakṣanāvalī*, he shows that one can define three of the other categories—substance, universal, and individuator—by specifying one or more of the inherence relations of entities in those categories and that qualities and motions can be distinguished from things in all of the other categories in this way as well, though they cannot be adequately distinguished from each other without invoking further primitive concepts.¹⁶ Thus, by making use of the idea of inherence, most of the Nyāya-Vaiśeṣika categories can either be adequately defined or supplied with necessary conditions.

Inherence can be defined as an asymmetrical relation which is (i) a constituent of the truthmaker for any true proposition of the form “this subsists in that” and (ii) such that none of its relata can, *while both continue to exist*, exist outside the relation.¹⁷ To say that inherence is a constituent of the truthmaker for any true proposition of the form “this subsists in that” is to say that it is that by virtue of which one thing *x* is in another thing *y* as its substratum (in the way a quality is in a substance, for instance). The notion of one thing subsisting in another is difficult to define, as is clear from the fact that Praśastapāda, an acute definer, was forced to appeal to examples to explicate it. But he did make clear that inherence is more intimate than conjunction (he gives as an example of conjunction “the curd is in the pit”).¹⁸ The intimacy of the nature of the

inherence relation is indicated by the Nyāya-Vaiśeṣika insistence that it is permanent, meaning that, *if* the relation is broken, one of its relata is destroyed.¹⁹ This last feature of inherence was taken by classical Nyāya-Vaiśeṣika thinkers to be integral to its function in uniting things in different categories such that one of the two sustains the other in being. Usually the one that is sustaining is the one that is the *substratum* of the other. This is true of a substance with respect to its qualities and motions and of the substances which form the parts of a composite. But in the case of the inherence of a universal in a particular, the ontological priority of the substratum (the inhered-in thing) with respect to the inhering thing, is reversed. Though it is the universal that inheres in the particular and the particular that is inhered-in, it is the universal that *gives being* to the particular by making it the *sort* of thing it is and it is the particular that could not survive apart from the universal that inheres in it, rather than the other way around.²⁰

The Nyāya-Vaiśeṣikas posited inherence to fulfill several ontological roles. Their conception of the way inherence links universals with particulars, and qualities and motions with substances, can reasonably be seen to involve what in the West is called “formal causality”. For in these cases the inherence relation brings it about that the inhered-in thing is, in some way, *characterized* by the inhering thing. For example, according to the Nyāya-Vaiśeṣikas, a brown cow is characterized, via the inherence relation, by the universal cowness and by a brown trope. But the Nyāya-Vaiśeṣika conception of the way inherence links composites to their parts did not involve any kind of formal causality. The Nyāya-Vaiśeṣikas would have insisted that it is not strictly speaking true that the threads of a mat are *characterized* by the mat. Hence, having material parts is importantly different from being a cow or being brown.²¹ This

peculiarity of what might be called the mereological function of inherence will play a role in our modification of the classical Nyāya-Vaiśeṣika doctrine of the nature of composites.

2. *The Category Substance*

Udayana gave several definitions of substance.²² One of them is “that in which inheres that in which inheres that which inheres.”²³ What Udayana meant by this is that only things in the category substance have inhering in *them* something that itself has something inhering in *it*. Every substance has a quality (taken as a trope) inhering in it, and every quality has more than one universal inhering in it, but no non-substance has inhering in it something that itself has something inhering in it. One might think, however, that qualities have inhering in them things which have other things inhering in them, since one might think either that some qualities have other qualities inhering in them, or that some universals have other universals inhering in them. But the Nyāya-Vaiśeṣikas denied that any quality could inhere in another quality—that would make a quality into a substance.²⁴ Although the red inhering in a rose is *a color*, that should not be taken to imply that a property particular inheres in the red of a rose (after all the red color of a rose is not colored); what it should be taken to imply is that both redness and colorness *co-inhere* in the red color of the rose.²⁵ Again, although everything that is red is colored, the Nyāya-Vaiśeṣikas thought it would be wrong to take that to mean that colorness inheres in redness. Whatever a universal inheres in is a particular, and redness is not a particular. Thus no universal inheres in another, but some universals are “higher” (have greater extension) than others.²⁶ Since both substances and qualities have universals

inhering in them (for instance, floweriness and roseness in a rose and coloriness and redness in the red of the rose), substances and qualities must be distinguished by some other feature. The difference that Udayana selects is this: nothing other than universals inheres in qualities, but non-universals inhere in every substance since every substance has qualities inhering in it. For x to be a substance, x need only be such that it has inhering in it some y that itself has some z inhering in it.

3. *Kinds of Substance*

It should be evident that, unlike Aristotle's definition of substance, Udayana's does *not* preclude substances from inhering in substances. For Udayana, and the Nyāya-Vaiśeṣikas generally,²⁷ substance is defined by *what inheres in it* rather than by *its inability to inhere*. There are two basic kinds of substance: eternal and non-eternal.²⁸ The Nyāya-Vaiśeṣikas held that atoms, souls, space, ether,²⁹ and time are the only eternal substances. These never came to be nor will they cease to be because they are simple, i.e. do not inhere in anything else.³⁰ Of these only atoms and souls are *kinds* of eternal substance (i.e. only these instantiate universals *peculiar* to them). Space, ether, and time, though they each instantiate the universals *substanceness* and *existenceness*, are not kinds of eternal substance since there is only one space, one ether, and one time.³¹ Atoms and souls can be differentiated in various ways, but one way is by reference to their magnitude. Atoms are wholly unextended, while souls have infinite extension (they are co-located with everything).³² Atoms do not inhere in anything and are the ultimate constituents of physical reality. Non-eternal substances are composite. They are extended, but their extension is limited.

4. *The Structure and Generation of Composite Substances*

In addition to being distinguished from souls by their magnitude, atoms are distinguished from them because they are capable of motion, and some of their motions result in the generation of new substances—composite substances.³³ Composites must inhere in two or more atoms. The substances in which composites inhere are their *inherence causes*. Recall that inherence is a relation such that, so long as each relatum persists, the relation persists. *Thus the generation of the composite substance does not destroy the atoms in which the composite is generated.* The whole is not, strictly speaking, made *out of* atoms; it *subsists in* them, occupying the same space as they do, though its space is not limited to the space occupied by any one of the substances it inheres in.³⁴ Atomic substances are sustaining causes of emergent wholes. For example, when two atoms are conjoined to make a dyad (the smallest sort of whole) a new substance comes to be *from nothing* in the previously existing atoms. This implies that when atoms of the right sort are conjoined in the right way they have the power to produce a new substance which inheres in them. This new substance is as distinct from them as they are from each other, and it is dependent on them both for its coming to be and for its continuing to. Atomic substances are causes of the wholes that inhere in them because they provide those wholes with their sustaining substrata. They also contribute, extrinsically, to the essence of new wholes by constraining the *kinds* of wholes that may come to be in them. To use an example from Nyāya-Vaiśeṣika physics, earth atoms are not suitable for the production of just any whole.³⁵

Atomic substances are not the only substances that can serve as inherence causes for emergent substances. Composite substances (that is, wholes) may also serve as constituents for further composites. In fact, the composites with which we are most familiar are the result of multiple layers of the inherence of substances in one another. A cloth inheres in threads, but those threads are not atoms. Nor do they proximately inhere in atoms. There is a long hierarchy of inherence relations that is responsible for every composite substance that humans encounter.³⁶ Composites that serve as inherence causes constrain their effects in the same way as atomic substances. It is impossible for a pot to be made from milk, or for curd to be made from clay.

What precipitates the generation of a composite substance? We said earlier that *some* motions of atomic substances produce composites. This is only loosely true. The most proximate cause of the generation of the emergent entity is the *conjunction* of the constituent atoms.³⁷ Conjunctions were held by the Nyāya-Vaiśeṣikas to be non-monadic qualities in which a certain quality universal (conjunctionness) inheres and which themselves inhere in more than one substance. Unlike inherence, conjunction was not thought by the Nyāya-Vaiśeṣikas to be a relation such that each of its relata must be in that relation for as long as both exist, i.e. the destruction of a conjunction is not necessarily accompanied by the destruction of any of the things related by it. In the case of the conjunction of two pots, the conjunction may be destroyed though both pots continue to exist. A conjunction, in essence, is the proximate spatial contact of two non-ubiquitous entities, and it is *non-locus-pervading*.³⁸ That it is non-locus-pervading means that two substances related to each other by it are so related only in virtue of certain of their parts. A pot on a table is conjoined with the table in virtue of its bottom being in

contact with part of the top of a table, not in virtue of all of its parts being in contact with some or all of the parts of the table.

There is another cause that we should touch upon. The *efficient cause* is what is responsible for the motion of substances, including atomic substances.³⁹ As we have seen, the Nyāya-Vaiśeṣikas held that when certain substances are conjoined in certain ways they produce new wholes that inhere in them. For this reason it might be thought that the Nyāya-Vaiśeṣikas held that such substances are partial efficient causes of the wholes that they produce in themselves. They did not, apparently for the same reason that Reid denied that any non-rational substance could be a true efficient cause—i.e., could *act* in the deepest sense. He denied this because he thought that a stick of dynamite is *determined* by its nature to explode when all the necessary and sufficient conditions for its exploding are present. The dynamite is more *acted on* than acting.⁴⁰ The Nyāya-Vaiśeṣika doctrine was similar.⁴¹ For them a genuine efficient cause acts freely, on purpose, for a reason. Souls are able to satisfy these conditions--insentient beings cannot; they are like falling dominoes. We point this out since, in light of the fact that the Nyāya-Vaiśeṣikas believed that wholes are what we would call emergent entities that are necessarily produced in certain insentient substances when those substances are conjoined in certain ways,⁴² it might appear puzzling that they did not include the proper parts of wholes among their efficient causes. We hasten to add, however, that the Nyaya-Vaisesika definition of efficient cause does not affect the aspects of their theory we are focusing on.

Finally, the Nyāya-Vaiśeṣikas recognized the instrumental cause. If a weaver uses a shuttle to move threads in the appropriate way to weave a cloth, the shuttle is an instrumental cause of the cloth.

The Nyāya-Vaiśeṣika account of causality in substantial generation takes into account each of the causes mentioned. The efficient cause moves preexisting substances in such a way that new conjunctions come to exist. Those substances serve as the substrata for the new composite. The emergent composite is produced *in* the inherence causes *by* the efficient cause or causes *in virtue of* the particular nature of those inherence causes. In the case of the generation of a cloth, the action of the weaver (using the shuttle) on pre-existing threads causes new conjunctions between them. These conjunctions are the most immediate causes of the emergent cloth.⁴³

5. The Qualities of Composite Substances and their Causes

We wish to point out one feature of the Nyāya-Vaiśeṣika doctrine of composites which will make it appealing to contemporaries who want to affirm the existence of such substances as cats, trees, and tables, while at the same time upholding scientific realism about their parts. This feature of the Nyāya-Vaiśeṣika doctrine is that it provides for structural explanations of the properties of composite substances *without* reducing those substances to their substantial parts or to collections of those parts. By a 'structural explanation' of the properties of composites we mean any explanation of those properties in terms of the parts such substances are made of coupled with the monadic and non-monadic properties of those parts. It should be clear from our earlier discussion of Aristotle's definition of substance that it precludes a structural explanation of the

properties of composites in terms of the properties of their substantial parts since it does not allow that any substance can inhere in another substance or group of substances.

On the other hand, reductivist accounts of composite substances have no trouble accommodating structural explanations of the properties of composite substances; in fact, the success of such explanations is often regarded as a powerful reason for endorsing reductivism. But reductivist accounts face the challenge of producing some candidate with which a composite could be identified. It is difficult to see how a composite substance could be *identical* to its parts, since those parts are numerically distinct from one another. Nor does it seem promising to say that a composite substance is identical to a set. Sets are generally thought to be abstract objects, and as such they apparently lack some of the properties with which material objects are endowed. One *can* trip over a cat, but *not* over a set. Although we do not want to insist that reductivists cannot find a way to meet this challenge, we want to point out that any theory of composite substances that can accommodate structural explanations without facing this challenge will have *some* advantages over reductivist theories. In the rest of this section we shall show how the Nyāya-Vaiśeṣikas accommodate structural explanations without endorsing reductivism about composite substances.⁴⁴

In opposition to reductivists of their day,⁴⁵ the Nyāya-Vaiśeṣikas insisted that such complex entities as cats,⁴⁶ trees, and pots *are* substances having properties of their own which are numerically distinct from the properties of any other substance or group of substances. In opposition to hylomorphists the Nyāya-Vaiśeṣikas would have insisted that the properties of composite substances can be partially explained by reference to the properties of the substances that composites inhere in. For these reasons the Nyāya-

Vaiśeṣikas posited a type of cause distinct from the inherence cause and the efficient cause. This type of cause they named the *non-inherence cause*.⁴⁷ We define it formally on their behalf:

Non-Inherence Cause = df. x is a non-inherence cause iff (i) x is a monadic or non-monadic quality inhering in one or more of the members of a set S of substances that are themselves related either by a non-monadic quality (e.g. conjunction, disjunction) or by inherence, and (ii) x is causally relevant either to the production of a new substance in the members of S , or to the production of a new quality in some of the members of S .⁴⁸

We have already mentioned the role that the conjunction of the parts of a composite plays in its production. The conjunction of the threads composing a cloth is the most proximate cause of the cloth, and it is neither an inherence cause of it (since the cloth inheres in the threads, not in *their* conjunctions), nor an efficient cause of it (since the efficient cause is what *brings about* the conjunctions of the threads). The Nyāya-Vaiśeṣikas thus dubbed it the non-inherence cause of the cloth.

The qualities of a cloth, according to the Nyāya-Vaiśeṣikas, have causes as real as the cloth. The inherence cause of these qualities is the composite, the cloth. But this cause does not exhaust the causes of the qualities of a cloth--those qualities, being qualities of a *composite* rather than of a *simple* substance, are in some way explicable by reference to the qualities of the substances in which the cloth inheres. *These* qualities were held by the Nyāya-Vaiśeṣikas to be the *non-inherence causes of the qualities of a cloth*. Consider a cloth's color. If a cloth is made entirely of black threads, the color of the cloth will be black and the color of the threads will be the non-inherence causes of

that color. Suppose, though, a cloth is made in black *and* white threads--what would the color of the cloth be? The Buddhist opponents of the Nyāya-Vaiśeṣikas objected that the Nyāya-Vaiśeṣika theory entails that the color of the *cloth* would be both black and white, an absurdity. The Nyāya-Vaiśeṣikas answered that their theory entails that the color of the cloth is neither white nor black but *variegated*.⁴⁹ Thus, in the case of a cloth made from differently-colored threads, we have an instance of a whole with qualities that are *different in kind* from the qualities of its parts, even though that quality is, itself, partly explicable by reference to the distinct colors of the threads in which the cloth inheres. According to the Nyāya-Vaiśeṣika theory, even a cloth made of threads uniform in color will have a color of its own, numerically distinct from the color of the threads in which it inheres.

The Nyāya-Vaiśeṣika insistence that *composite substances possess qualities that are numerically distinct from the qualities of their parts* suggests another objection. Buddhist opponents of the Nyāya-Vaiśeṣikas argued that, if this were correct, composites would weigh *twice as much* as the combined weight of their parts.⁵⁰ Since obviously woven threads do not tip the scales any more than unwoven, it is false that composites possess qualities numerically distinct from those of their parts. And if some of the qualities of a composite are reducible to the qualities of its parts, what reason is there for refusing to reduce *it* to its parts?

The typical Nyaya-Vaisesika answer to this was weak--composites weigh more than their parts combined, but this additional weight is too slight for us to detect.⁵¹ It seems that what the Nyāya-Vaiśeṣikas should have said is that composites do not have *any* weight. This reply may strike the reader as counterintuitive. We want to say a

few words in defense of it. The first point to note is that in metaphysics there is no free lunch. Every substantive and consistent account of the world has some counterintuitive implications. Rather than jettison any metaphysical theory that has unexpected consequences, we think it more reasonable to weigh the theoretical merits (and demerits) of theories against one another. The point of this paper is to advertize the merits of a modified Nyāya-Vaiśeṣika account of composite substances; we leave it to the reader to decide how attractive she finds the wares we are offering and whether they are worth the price.

Second, we want to respond to the Buddhist contention that, if composites possess qualities that are numerically distinct from the qualities of their parts, they must weigh twice as much as the combined weight of those parts. The Nyāya-Vaiśeṣikas are committed to the claim that each quality of a composite substance is numerically distinct from the qualities of its parts. Furthermore, they took it that such irreducible qualities were to be explained by reference to the parts' qualities. Nonetheless, it *does not follow* from this that a composite possesses any weight whatsoever, nor that it should possess a weight equal to that of the sum of its parts. To put it more generally, from the fact that each of a composite's qualities are irreducible to the qualities of its parts, and that the qualities of its parts help to explain the existence of these qualities, nothing follows about what *sorts* of qualities that composite has or could have. That a cloth has no weight even though its parts do may be surprising; but science has shown that intuition is

not a good guide concerning what properties macro-entities will turn out to have in light of the properties of the micro-entities that compose them, nor concerning what properties micro-entities will have in light of the macro-entities that they compose. The Nyāya-Vaiśeṣikas themselves realized this since they gave powerful arguments that atoms could not have any magnitude. This presented them with a problem of how to account for the magnitude of the composite substances made in such atoms. They ingeniously tried to solve this problem by having recourse to the *plural number* of the atoms composing the smallest wholes (dyads) as well as the way they are conjoined. We do not wish to defend the Nyāya-Vaiśeṣika theory on this point; rather, we simply wish to note that they were aware of the now commonly acknowledged fact that micro-entities have some properties that are radically different from the macro-entities they compose, and vice versa.

Before continuing we should note that the Nyāya-Vaiśeṣika insistence that a whole is not only different from the substances in which it inheres, but is also a distinct *substance* possessing *qualities of its own*, saves it from having to embrace some highly counterintuitive consequences of certain contemporary theories of the nature of composites which are similar to the Nyāya-Vaiśeṣika theory in positing the existence of wholes which (i) are really distinct from the parts composing them, (ii) are “co-located” with their parts, and (iii) depend, *in some way*, on the properties of their parts for their own.

The most celebrated of these theories has been expounded and defended over many years by David Wiggins.⁵² Wiggins, *like* the Nyāya-Vaiśeṣikas, insists that a composite such as a tree is not identical with the parts it is made of. *Unlike* the Nyāya-Vaiśeṣikas, he supposes that the aggregate of cellulose molecules a tree is made of is *a* thing⁵³ (even if it is not a *substance*) and he denies that a tree is “something over and above its parts.” More particularly, Wiggins denies that a tree is a distinct *material* substance from its parts.⁵⁴ But if a tree is *not* a material substance, it is hard to see how it could be a substance at all. Furthermore, if a tree, though being distinct from the aggregate it is made of, is not, nevertheless, a material substance *with particular properties of its own* that are *numerically distinct from those of the aggregate it is made of*, then, as Michael Rea has argued, it would seem that the aggregate of wood molecules making it up would be every bit as much a tree as the tree itself!⁵⁵

II The Evanescence Objection

The Nyāya-Vaiśeṣika doctrine of composites is open to several objections. Leaving aside objections from those philosophers who find the concept “substance” problematic, the most powerful of these boil down to four: the conjunction objection, the criterion objection, the weight objection, and the evanescence objection. The conjunction objection deals with problems concerning how two material substances, whether of atomic or non-atomic size, could ever be conjoined in the sense of coming into direct spatial contact. The criterion objection deals with the problem of establishing non-

arbitrary criteria for determining when the conjunction of already existing substances leads to the production of new wholes. As we have seen, the weight objection deals with the fact that wholes apparently weigh no more than the sum of their parts. The evanescence objection deals with the problem of how composites could survive the loss of any of the substances in which they inhere. All these objections were pressed against the Nyāya-Vaiśeṣikas hundreds of years ago.⁵⁶ We believe the Nyāya-Vaiśeṣikas came up with plausible answers to the first two of these,⁵⁷ but because of limitations of space we will not consider them. As we have already pointed out, we think that the Nyāya-Vaiśeṣika answer to the weight objection is weak, but that they could have availed themselves of a more plausible answer. Because we believe that the evanescence objection is the most serious of these four, and the only one that demands that the Nyāya-Vaiśeṣika theory be modified, we shall spend the rest of this paper addressing it.

The Nyāya-Vaiśeṣikas were mereological essentialists.⁵⁸ Their mereological essentialism was motivated by two important doctrines about parts and wholes. It was *not* motivated by the claim that wholes just *are* their parts related in certain ways. Of course, if you think that a whole *just is* its parts related in certain ways, then the removal (or addition) of a part *would constitute* the destruction of the “whole.” But the Nyāya-Vaiśeṣikas thought that the parts of a whole individuate it and sustain it. Since we discuss their theory of individuation later, we shall here briefly focus on their view that parts are sustaining causes of their wholes, and on how their doctrine of the relation between parts and wholes entails mereological essentialism.

Since inherence is an inseparable relation—that is, a relation such that, so long as each relatum exists, the relation must—it follows that if the inherence relation is broken, at least one of the relata is destroyed. Which one? Given the definition of inherence, it is logically possible that both the parts and the whole be destroyed when the inherence of the whole in its parts is. We do not intend to debunk this possibility; here it will suffice to show that the whole cannot survive the severing of the relation between it and any of its parts. Since atoms are indestructible, when the inherence between a whole and the atoms it inheres in is destroyed, it must be the whole that is. But this leaves open the possibility that in cases in which a whole inheres in parts that are *themselves* composites, it is the *parts* rather than the *whole* which are. Here we offer two reasons for thinking that the whole is *always* destroyed when its relation to a part is.

The first is based upon a feature of the relation of wholes to their parts which we have not mentioned: it is transitive.⁵⁹ If x is composed of y , and y is composed of z , then x is composed of z . Since atoms are the ultimate physical constituents of the universe, it is clear from the transitivity of the “whole-part” relation that every whole inheres, whether immediately or mediately, in some atoms. These facts, combined with the facts that inherence is an inseparable relation and that atoms are indestructible, are enough to show that a whole cannot survive the loss of a single proper part. Assume that the inherence between whole w and one of its proper parts p exists at time t_1 and is broken at time t_2 . Then at t_1 there is a series of ancestral inherence relations, going backward from w to p and ultimately to some atom a , with finitely many members of the series between p and a . Since the inherence between whole and part is transitive, w must inhere in a at t_1 , and the inherence between them must be broken at t_2 . And since inherence is inseparable,

either w or a must be destroyed at t_2 . But since a is an atom, and hence indestructible, w must be destroyed.⁶⁰

Another reason which the Nyāya-Vaiśeṣikas used in defense of their mereological essentialism is that a whole cannot survive the loss of *all* its. If it cannot survive the loss of *all* of its parts, there seems to be no non-arbitrary way of determining how *many parts* it could lose yet remain in existence. Thus, the majority of the Nyāya-Vaiśeṣikas embraced the view that a whole could not continue to exist after the loss of a single part.

Although the mereological essentialism of the Nyāya-Vaiśeṣikas is entailed by their view that wholes inhere in their parts, and though such a mereological essentialism would supply very clear answers to certain mereological puzzles, it is not without problems. Even in the hey-day of the Nyāya-Vaiśeṣika school, it was clear that some purported composites—organisms—frequently lose and gain particles.⁶¹ Since then, science has shown indisputably that this takes place, not only in the case of organisms, but also in the case of artifacts such as pots and tables. In fact, it is now known that microscopic particles are being ejected and drawn into such purported wholes almost continuously. Let us call the proposition expressed here, that particles are being frequently expelled and drawn into wholes, (f). Let us call the proposition expressed by Nyāya-Vaiśeṣika mereological essentialism—that the loss of a proper part from a whole is a sufficient condition for the destruction of the whole—(m).⁶²

The evanescence objection notes that the conjunction of (m) and (f) is inconsistent with the commonsense view that wholes endure for longer than a moment. The objection can be formalized as follows:

(1) If both (*m*) wholes cannot survive the loss of a single proper part, and (*f*) wholes lose proper parts frequently, then wholes are destroyed and generated frequently.

(2) (*m*) Wholes cannot survive the loss of a single proper part.

(3) (*f*) Wholes lose proper parts frequently.

(4) Therefore, wholes are destroyed and generated frequently.

The conclusion of this argument ought to be embarrassing for a substance-realist school that prided itself on its defense of common sense. The Nyāya-Vaiśeṣikas had for generations opposed philosophical schools that argued that plants, animals, and artifacts are illusions. Indeed, one great twentieth-century Buddhist scholar of classical Indian philosophy, D. Shastri, practically gloats at the position that the Nyāya-Vaiśeṣikas are forced to adopt. What separates the Nyāya-Vaiśeṣikas from their anti-realist opponents?⁶³

The Nyāya-Vaiśeṣikas, though vociferous defenders of common sense, were not afraid to accept counterintuitive conclusions if necessary. The most common answer that they gave to the evanescence objection was to accept its conclusion.⁶⁴ So, as it turns out, wholes are destroyed and generated much more frequently than we had thought. Though this is counterintuitive, it is not as bizarre as it may initially appear. First, wholes are not momentary or illusory *in principle*. Though they are frequently generated and destroyed, this is not essential to them. It just so happens that they are often deprived of

their sustaining causes. Second, the unexpectedly short careers of composite substances should not radically affect our view of human persons or other sentient beings, since sentient beings are, properly speaking, *souls*—not bodies—and souls are simple substances. Souls are accidentally conjoined with bodies, and, as it turns out, these bodies tend to endure only for a short time.

Nonetheless, evanescence should be regarded as a deficiency for any theory of composites. We think that the primary aim of a theory of composite substances is to account for the truth of our intuitions about medium-sized objects such as horses and salamanders (or at any rate about their bodies). Although the *Nyāya-Vaiśeṣika* theory does account for the truth of many intuitions about mundane objects—viz., that they are genuine substances, that their parts are genuine substances, that their qualities are explicable by those of their parts, etc.—it does not account for one of the strongest of such intuitions, that some mundane objects endure for more than a few moments. Fortunately, we think that there is a way to modify the *Nyāya-Vaiśeṣika* theory so that its desirable features are preserved and its most significant wrinkle is ironed out. The rest of this paper will be devoted to this modification.

III The Modified Nyāya-Vaiśeṣika Theory of Composite Substances Stated

Our modification of the *Nyāya-Vaiśeṣika* theory of the nature of composite substances is partially inspired by Locke's theory of such substances, but adds to it the *Nyāya-Vaiśeṣika* notion that a composite

substance is a whole that is a real substance, really distinct from its parts.

In his classic *An Essay Concerning Human Understanding*, Locke asserts that numerically the same composite substance can endure between time t and t^* just in case, at every time t_1, t_2 , etc. that occurs between time t and t^* , it has enough proper parts arranged in the right way to continue being the same *sort* of composite.

We must therefore consider wherein an oak differs from a mass of matter; and that seems to me to be in this: That the one is only a cohesion of particles of matter anyhow united; the other such a disposition of them as constitutes the parts of an oak, and such an organization of those parts as is fit to receive and distribute nourishment, so as to continue and form the wood, bark, and leaves, etc., of an oak, in which consists the vegetable life. That being the one plant which has such an organization of parts in one coherent body, as long as it partakes of the same life, though that life be communicated to new particles of matter vitally united to the living plant in a like continued organization, conformable to that sort of plants. For this organization being at any one instant in any one collection of matter, is in that particular concrete distinguished from all other, and is that individual life which existing constantly from that moment both forwards and backwards, in the same continuity of insensibly succeeding parts united to the living body of the plant, it has that identity which makes the same plant, and all the parts of it parts of the same plant, during all the time that they exist united in that continued

organization, which is fit to convey that common life to all the parts so united.⁶⁵

Locke lights on the highly plausible idea that a living being has a kind of unity of life that a mere assemblage of parts “anyhow united” does not, and that this unity makes it sensible to suppose that it is a substance distinct from the parts that make it up.⁶⁶

Furthermore, he brilliantly posits that as long as a living being, whether a tree, or a flower, or a cat, continues to be, without interruption, a living being of the same *sort* it first was, one can sensibly suppose that it continues to be *numerically the same* living being, even if, after a time, it loses all the original parts that first constituted it. What is essential to its continued existence is not the *very parts that first constituted it*, but any *sufficient number of parts arranged in the right way* to support the sort of life the living being has.

Unfortunately, the precise ontological status of the “life” of the plant which Locke speaks of here is not clear. We *do* wonder whether or not this life is anything more than a *series of relations* between a succession of inanimate substances productive of certain changes and effects, or is actually *a substance* that is really distinct from the parts making up the living being. Locke does not tell us.

We wish to add to Locke’s suggestions concerning the continued identity of living beings, the Nyāya-Vaiśeṣika notion that a whole is a substance distinct from, yet dependent on, its parts, with qualities of its own. If it really is *a substance* distinct from the parts in which it inheres, then it seems, at least at first glance, that it could continue to exist as the very same substance it had been originally, even if it gradually lost all of its original parts. Ignoring for a minute some difficulties with this, difficulties we will attend to shortly, let us use an analogy to illustrate what we mean.

Consider a dome supported by eight pillars, where each pillar lends some support to the dome, but only four of them, arranged in the right order, are necessary to support it. That each pillar lends *some* support to the dome but that only four are *necessary*, amounts to saying that the dome would go on being supported if only four of the pillars, *in the right order*, were left standing—although, of course, the dome would be less resistant to toppling by external forces than it would be with all eight pillars. The dome is analogous to a Nyāya-Vaiśeṣika whole and the pillars to its proper parts.

Suppose that one day the dome loses one of the pillars supporting it, but remains standing. In this case it seems it continues to be *a dome*, indeed, continues to be numerically the *same* dome it was before. Now suppose that gradually it loses all of the original eight pillars but always has at least four ordered in the right way to support it and that at the end of 200 years it comes to be supported by a numerically distinct, but formally identical, group of pillars from the ones that originally supported it. Ignoring, as not being relevant to our analogy, that many of the micro-particles that first composed the dome will have been lost and/or replaced during the span of 200 years, it seems clear that the dome remains the same dome, i.e. it remains the same covering of a building in a certain part of the earth that it began to be when it was supported by the first group of pillars. Since all the pillars have been replaced, the dome might not be the roof of the *same building* it originally capped, but it is none the less the same *dome* it always was, and not just the same slab of marble.

Since on the Nyāya-Vaiśeṣika view a whole is a substance existing alongside the parts it inheres in, rather like the dome in relation to the pillars, we think that it is ontologically thick enough to lose some of the parts that originally supported it while

continuing to exist. It is also ontologically thick enough to gradually lose *all* of the parts that originally supported it, so long as it always has enough of the right sort of parts arranged in the right way to support it. This entails, as well, that its number of parts can increase as long as its new parts come to be related in the right way to its remaining parts, and so, to *it*. The argument that we have suggested via the dome analogy (call it W) can be formalized as follows:

(1) If composite substances are wholes that are really distinct entities from the substances that sustain them as their proper parts, then the sustaining power of the proper parts of a whole consists in their being substances of the right sort related in the right way, not in their being the particular substances they are having the particular relations they do.

(2) If the sustaining power of the proper parts of a whole consists in their being substances of the right sort related in the right way, not in their being the particular substances they are having the particular relations they do, then composite substances can continue to exist even though they are no longer sustained by *any* of the substances that originally sustained them, as long as enough substances of the right sort related in the right way sustain them.

(3) Therefore, if composite substances are wholes that are really distinct entities from the substances that sustain them, then composite substances can continue to exist even though they are no longer sustained by any of the substances that originally sustained them, as

long as enough substances of the right sort related in the right way sustain them.

Before turning to an objection to *W*, we wish to say something in support of its first premise. Unless one has good reason for thinking that the causality of some particular substance or group of substances is necessary for the continued existence of a substance that *it* or *they* caused, the very fact of the distinction between cause and effect makes it plausible to suppose that the substantial effect of some substance or group of substances can continue to exist without being continually sustained in being by the causality of the substance or group of substances that originally sustained it. The cause is one thing and its effect another, and so the cause cannot constitute the *intrinsic being* of the effect, unless the cause is formal, i.e. makes the effect to be *what* it is, or material, i.e. is an internal constituent of a whole in the way it is commonly believed that the parts which “make up” a whole are. The Nyāya-Vaiśeṣikas did recognize formal causality, which is why they held that universals and property tropes characterize the entities they inhere in, and is also why they held that a universal in some way gives being to its particular by making it to be the *kind* of thing that it is. But this is clearly not the case with respect to the inherence of a whole in its parts since the whole does not cause the parts to be what they are, nor can it be truly predicated of them in the way universals can of particulars. Furthermore, the Nyaya-Vaiseisikas held that the parts of a whole are substances distinct from it, that they produce the whole in themselves when they are conjoined in the right way, and that they continue to sustain the whole as a distinct entity by serving as its substrata. Thus, oddly enough, according to the Nyāya-Vaiśeṣikas the whole is *not* intrinsically constituted by its parts in the way that many medieval

European scholastics took a composite substance to be intrinsically constituted by its parts (form and matter).⁶⁷ With all this in mind one might wonder why it should be thought that a Nyāya-Vaiśeṣika whole needs its *original* inherence causes in order to remain in existence.

What we are in effect arguing for is that there may be a unique type of relation that is distinct from the relations of inherence and conjunction, but which has some of the features of both. Although the Nyāya-Vaiśeṣikas did not introduce this innovation themselves, we believe that their conception of wholes did lay the groundwork for it since, as we have noted, their conception of the way inherence relates wholes to their parts is significantly different, in several respects, from their conception of the way it links universals to particulars or qualities to substances. This suggests that it may have been an oversight for them to think that wholes and parts are related to each other in the same way as universals are to particulars, or as qualities are to substances. We wish to exploit this tension in the Nyāya-Vaiśeṣika account of inherence by supposing that wholes are not related to their parts by inherence, but by a new relation we shall call “inherence*”. Inherence* shares three features of Nyāya-Vaiśeṣika inherence between wholes and parts, and one feature of Nyāya-Vaiśeṣika conjunction. Like conjunction it is *not* an inseparable relation--it is not such that if it is broken at least one relata must cease to exist. But like Nyāya-Vaiśeṣika inherence between wholes and parts, it *is* locus-pervading, asymmetrical, and transitive.

We define inherence* as follows:

Inherence* = df. For any substance x and any set of substances S , x and the members of S are related by inherence*, iff (i) x is conjoined in a locus-pervading way to each of the members of S , and (ii) x is such

that in order to be sustained in being it must be conjoined, in a locus-pervading way, either (a) with a certain number of the members of S related to each other in a certain way W, or (b) with a certain number of the members of a set of substances T that are the same in kind as the members of S and are related to each other in way W.⁶⁸

We wish to make three points about this definition. The first is that, in saying that “x is conjoined in a *locus pervading* way with each of the members of S...or T” we mean to say that x is spatially present to each of the members of S to the same degree. To put the point in a slightly different way, we could say that x *occupies the same space* as the “aggregate” of the members of S or T, but does not do so by means of any parts that intrinsically constitute it since x, being a whole, is not made *of* other substances but *relies on them* for its being.

The second point we wish to make about our definition of inherence* is that, in speaking of “x’s being sustained in being in virtue of some relation R (here inherence*) that it bears to the members of a set of substances S or T” we mean to say that x *depends* for its *continued existence* on having such a relation to the members of S or T. We shall pass over here the question whether or not statements of the form “x depends on having the relation R to y for its continued existence” can be analyzed non-trivially (we suspect not). We shall also pass over the question whether or not inherence*, unlike inherence, should be conceived to be a universal, a universal that has that has as its instances non-monic qualities (we strongly suspect so).

The final point we wish to make about our definition is that inherence* is logically possible, and supposing that *it* is what relates wholes to their parts allows us to affirm the commonsense intuition that composites can survive the loss of all of their parts

while, also allowing us to keep the best insights of the Nyāya-Vaiśeṣika doctrine of composites. In light of this, we think it reasonable to suppose that composite substances are related to the parts that “make them up” by inherence*, unless there is a strong reason for thinking that they cannot be. In the next section we shall consider what we take to be the best reason for thinking that composite substances cannot be related to their parts by inherence* and, hence, that W is unsound.

IV The Individuation Objection to W

The Nyāya-Vaiśeṣikas would reject premise (1) of W, since they held that inherence not inherence* is the relation that binds wholes to parts. We have already seen that holding inherence is what binds wholes to parts entails mereological essentialism. Here, we want to say something about why the Nyāya-Vaiśeṣikas clung to inherence as the relation obtaining between wholes and parts. Their chief reason rested on their theory of the individuation of substances. It will become clear from our discussion that their doctrine of the individuation of substances itself entails mereological essentialism, quite apart from other considerations of the nature of the inherence relation, though it seems to have taken the Nyāya-Vaiśeṣikas some time to realize this.

According to the Nyāya-Vaiśeṣikas every individual substance must be distinguished from every other substance by some difference with respect to inherence relations. Such a difference could arise either from what *inheres in* a substance or from what *it inheres in*. Since the Nyāya-Vaiśeṣikas did not accept the bundle theory of

particulars, they did not accept that a substance could be individuated by quality or motion particulars. A red rose could not be *fundamentally* distinguished from a yellow one in virtue of being red since the rose itself must exist as a substance in order to have qualities or motions inhering in it. Indeed one of the arguments that some Nyāya-Vaiśeṣikas gave in support of their substantivalism was that, without substances, qualities could not be individuated.⁶⁹ What makes the red color of one red rose numerically distinct from the qualitatively indistinguishable color of a second red rose is that the first red inheres in the *first* rose and the second inheres in the *second*. But if qualities and motions cannot be the properties that individuate substances, what properties could? In some cases universals could. Substances of different sorts can be distinguished by the different sorts of substance universals they instantiate.⁷⁰ A cow can be distinguished from a horse in virtue of some universals that inhere in it that don't inhere in a horse, and a horse can be distinguished from a cow in virtue of some universals that inhere in it but don't in a cow. But this does not solve the problem of how two substances in the same *specific* category can be distinguished from other substances in that category.

With respect to wholes the Nyāya-Vaiśeṣikas held that the only thing that could distinguish one from another in the same specific category is that whole's inherence in the *particular* substances it inheres in.⁷¹ Every whole is such that some other whole of the same *specific kind* could be generated; therefore the Nyāya-Vaiśeṣikas concluded that the principle of individuation for every whole is its inherence in the particular substances it inheres in. Since the principle of individuation of a substance is what makes a substance to be the *individual* substance it is, the Nyāya-

Vaiśeṣikas drew from this the conclusion that a whole could not survive the loss of *any* of its parts. It should be obvious that with regard to their individuation wholes were treated as similar to qualities and motions by the Nyāya-Vaiśeṣikas since, according to their doctrine, wholes, like qualities and motions, have a sort of borrowed individuation.

With respect to simple substances,⁷² the Nyāya-Vaiśeṣikas held that the property particular which distinguishes any one of them from other simple substances is the individuator inhering in it.⁷³ Nyāya-Vaiśeṣika individualators were very like Scotus's thisnesses. They did not think of them as qualitative or as instantiating the universal *indivuatorhood*.⁷⁴ Were there such a universal, then every individuator would be alike in instantiating it, and a further individuator would need to be posited to distinguish one individuator from another, and so on, *ad infinitum*. In fact, according to the Nyāya-Vaiśeṣika doctrine, individualators are property particulars which do not instantiate *any* universal.⁷⁵ True, each is similar to the others in individuating the particular it inheres in, but this is not in virtue of a universal peculiar to individualators. Furthermore, according to the Nyāya-Vaiśeṣikas, since the essence of an individuator is to individuate and since no individuator is itself individuated by another, each individuator is self-individuating, i.e. it not only distinguishes the substance it inheres in from other substances of the same specific kind, it also distinguishes itself from other individualators!⁷⁶

It is clear that the Nyāya-Vaiśeṣika notion of individuation, coupled with their rejection of a bundle view of particulars, drove them to the doctrine that eternal substances are individuated by individualators that are unique to each. It is also clear

that the doctrine is fraught with difficulties. That is why at least one great Nyāya-Vaiśeṣika thinker, Raghunātha Śiromaṇi, dispensed with individuators entirely. He reasoned that the individuators are posited without sufficient reason since, if they can individuate themselves, there is no reason to suppose that simple substances could not do the same without help.⁷⁷ But if every simple substance is self-individuated, there seems to be no reason to deny that wholes are self-individuated as well and, hence, are able to survive the loss of their parts without losing their identity.

V Conclusion

The theory of composite substances which we have presented here is intended as a plausible alternative to theories which rely on Aristotle's definition of substance, as propounded in the *Categories*. It seems obvious that *composite* substances have parts. Furthermore it seems that they must be *in* their parts. But if the correct definition of substance precludes a substance being in its parts, we are left with the unhappy conclusion that there are no composite substances—no horses, salamanders, chairs, etc. Aristotelians have developed subtle responses to the problem of how there may be genuine composite substances with genuine parts without the composite being in its parts. Nonetheless, one may prefer to sidestep this *prima facie* difficulty for Aristotelian theories if one can do so at little cost. Our modified Nyāya-Vaiśeṣika theory provides such an opportunity. It provides for the genuine, ontologically robust, existence of both composites and their parts, without suggesting any *prima facie* tension between them, and it also allows that some composite substances exist for long periods of time. Finally, it

offers a structural explanation of the qualities of composite substances in terms of the qualities of their parts, in a way that is amenable to scientific realism.⁷⁸

Notes

¹ Aristotle, *Categories*, 1b-5.

² *Ibid.* 1a20.

³ *Ibid.* 1a25-1b.

⁴ *Ibid.* 1a16-19.

⁵ *Ibid.* 3a29-31.

⁶ An “orthodox” school of Indian thought is any school which accepts the authority of the *Vedas*, ancient religious texts of the Hindus composed over many centuries by different authors (see Surendranath Dasgupta, *A History of Indian Philosophy, Vol. I* (Cambridge: Cambridge University Press, 1922—Reprinted, Delhi: Motilal Banarsidas, 1997), 67–71). For useful introductions to Nyāya-Vaiśeṣika thought see Stephen Phillips, *Classical Indian Metaphysics* (Chicago: Open Court, 1995), esp. 41–74; Bimal Matilal, *Perception: An Essay on Classical Indian Theories of Knowledge* (Oxford: Oxford University Press, 1986); Dharmendra Nath Shastri, *The Philosophy of Nyāya-Vaiśeṣika and its Conflict with the Buddhist Dignāga School* (Delhi: Bharatiya Vidya Prakashan, 1964); Karl Potter, *Encyclopedia of Indian Philosophies, Vol. II: The Tradition of Nyāya-Vaiśeṣika up to Gaṅgeśa* (Delhi: Motilal Banarsidas, 1977).

⁷ On this see Potter, 1–3.

⁸ On Praśastapāda’s importance in the development of the ontological categories of the Nyāya-Vaiśeṣikas, see Wilhelm Halbfass, *On Being and What There is: Classical Vaiśeṣika and the History of Indian Ontology* (Albany: State University of New York Press, 1992), 149–150.

⁹ See Praśastapāda, *Padārthadharmasaṅgraha*, translated by Guṅgānaṭha Jhā with the *Nyāyakandalī* (commentary) of Śrīdhara (900s A.D.) (Delhi: Chaukhambha Orientalia, 1982), Text 1, p. 13.

¹⁰ The Nyāya-Vaiśeṣikas did not believe in propositions taken as abstract entities intervening between beliefs and facts. But they did believe in them taken as the intentional content of cognitions, a content that can be *expressed* in sentences and is common to the cognitions of different individuals. See Bimal K. Matilal, *The Navya-Nyāya Doctrine of Negation* (Cambridge: Harvard University Press, 1968), 11-21; Bimal K. Matilal, *Logic, Language and Reality* (Delhi: Motilal Banarsidas, 1985), 114-115.

¹¹ On this see Potter, *Encyclopedia*, 45-49. The Nyāya-Vaiśeṣikas did not, of course, use the word “truthmaker” in explaining their categories. Their word for category was “*padārtha*” (literally “the

meaning or referent of a word"). Nevertheless, there can be little doubt that they thought of their categories as an enumeration of all the kinds of entities which one must posit to constitute the truthmakers for true beliefs, and this fact is often evinced in their definitions of particular categories. Thus Udayana, in his *Laksanāvalī*, #206, defined absence as "the object of a notion expressed by a negative particle." See Musashi Tachikawa's translation of the *Laksanāvalī* in *The Structure of the World in Udayana's Realism*, (Dordrecht: D. Reidel Publishing Company, 1981), 85.

¹² On this see Tachikawa, *The Structure*, 3-6, 18-24.

¹³ According to the Nyāya-Vaiśeṣikas the verb "to be", when used of particulars, is always predicative. Thus, if I say "A rose is" (i.e. exists), that means, according to the Nyāya-Vaiśeṣikas, that the universal existenceness (*sattā*) inheres in it. When the verb "to be" is used to speak of universals, or inherence, or individuators, or absences, it is not predicative, but merely indicates that the entities in those categories are *real* (i.e. *mind independent*), though they don't, strictly speaking, exist. On this see Phillips, pp. 45-51, and Śrīdhara's commentaries on Text 7 and Text 19 of the *Padārthadharmasaṅgraha*, pp. 25-31, and 45-49 in Jhā.

¹⁴ On this see Jonardon Ganeri, *Philosophy in Classical India* (New York: Routledge, 2001), 72-77.

¹⁵ On Udayana's prominence in the Nyāya-Vaiśeṣika tradition see Potter, *Encyclopedia*, 7-8, and Kisor Chakrabarti, *Classical Indian Philosophy of Mind: the Nyāya Dualist Tradition* (Albany: State University of New York Press, 1999), 220-221.

¹⁶ See Ganeri, *Philosophy in*, 77; Shastri, *The Philosophy of Nyāya-Vaiśeṣika*, 347-394.

¹⁷ For the classical Nyāya-Vaiśeṣika definition of inherence see *Padārthadharmasaṅgraha*, Text 157, pp. 675-676 in Jhā. For useful discussions on the nature of inherence in the Nyāya-Vaiśeṣika system, see Ganeri, 74; Shastri, 374-394.

¹⁸ See text 157 of the *Padārthadharmasaṅgraha*, pp. 675-676 in Jhā.

¹⁹ See Śrīdhara's commentary on Text 9 of the *Padārthadharmasaṅgraha*, pp. 32-33 in Jhā; Jadunath Sinha, *Indian Philosophy, Vol. I* (Delhi: Matilal Banarsidass, 1978), 366-368.

²⁰ On this see Bimal Matilal, *Epistemology, Logic and Grammar in Indian Philosophical Analysis*, ed. by Jonardon Ganeri, (Oxford: Oxford University Press, 2005), 32-33.

²¹ Thus Praśastapāda notes that, in its mereological function, inherence joins causes and effects, while in other cases it does not (Text 157, p. 675 in Jhā).

²² Unlike the European scholastics, the Nyāya-Vaiśeṣikas accepted as a definition any set of necessary and sufficient conditions that is able to distinguish the thing to be defined from all other things. Cf. Phillips, *Classical Indian Metaphysics*, 63–65.

²³ This is the translation of this definition given by Ganeri, *Philosophy in*, 75. It occurs in the *Lakṣanāvalī*, #12, p. 57 in Tachikawa.

²⁴ See Śrīdhara's commentary on Text 46 of the *Padārthadharmasaṅgraha*, pp. 209–210 in Jhā; Annaṃbhaṭṭa, *Tarkasaṅgraha-Dīpikā*, translated and elucidated by Gopinath Bhattacharya (Calcutta: Progressive Publishers, 1976), # 3, C i–ii, pp. 28–34; Ganeri, *Philosophy in*, 76.

²⁵ See Matilal *Epistemology*, 49.

²⁶ The Nyāya-Vaiśeṣikas held that supposing universals to inhere in other universals would entail that there is a universal "universalhood" and that would entail an infinite regress similar to the "third man" problem discussed by Plato. On this see Udayana, *Kiranāvalī*, ed. J. S. Jelty, p. 15, line 14 to p. 16, line 21, as translated by Halbfass, *On Being*, 260–261; Śrīdhara's commentary on Text 19 of the *Padārthadharmasaṅgraha*, pp. 45–46.

²⁷ The traditional Nyāya-Vaiśeṣika definition of substance is just that a substance is that in which qualities inhere. See the *Vaiśeṣika Sūtras of Kaṇānda with the Commentary of Śaṅkara Miśra*, translated by Nandalal Sinha (Bhuvaneśwari Āśrama: Allahbad, 1911), I, 15, p. 27. This definition, like Udayana's more parsimonious definition, does not entail that a substance cannot inhere in anything. Cf. note 28.

²⁸ See Śrīdhara's commentary on Text 16 of the *Padārthadharmasaṅgraha*, pp. 42–43 in Jhā; J.N. Mohanty *Classical Indian Philosophy* (Rowman & Littlefield), 44–45; Sinha *Indian Philosophy*, 343–344.

²⁹ Ether was the substance which the Nyāya-Vaiśeṣikas posited as the substratum of sound. Its existence was also recognized in other Indian philosophical schools.

³⁰ On the Nyāya-Vaiśeṣika conception of eternal substances see Potter *Encyclopedia*, 73–74; Sinha *Indian Philosophy*, 343–344.

³¹ On this, see the celebrated passage from Udayana's *Kiranāvalī*, translated in Halbfass, *On Being* 260, as well as Phillips' commentary on it in *Classical Indian Metaphysics*, 60–63.

³² For the classical account and defense of Nyāya-Vaiśeṣika atomism see the *Nyāya Sūtras of Gautama with the Bhāṣya* (commentary) of Vātsyāyana and the *Vārṭika* (commentary) of Uḍḍyoṭakara, Vol. IV, translated by Guṅgānaṭha Jhā (Delhi: Matilal Banarsidass, 1985), 4, 2, 17–25, pp. 1606–1628. For a good account of the Nyāya-Vaiśeṣika argument that souls are ubiquitous, see Bhattacharya’s commentary on the *Tarkasaṃgraha-Dīpikā*, # 17, pp. 98–103. For an excellent overall account of the Nyāya-Vaiśeṣika doctrine of the soul, see Chakrabarti, *Classical Indian Philosophy of Mind*, 19–29.

³³ On the Nyāya-Vaiśeṣika theory of composite substances see Vātsyāyana’s and Uḍḍyoṭakara’s commentaries on the *Nyāya Sūtras*, 2, 3, 34–36, in Jhā, Vol. II, pp. 757–797.

³⁴ On this see Shastri, *The Philosophy of Nyāya-Vaiśeṣika*, 238–243.

³⁵ On this point see Śrīdhara’s commentary on Text 88 of the *Padārthadharmasaṅgraha*, pp. 308–312 in Jhā; Vātsyāyana’s and Uḍḍyoṭakara’s commentaries on the *Nyāya Sūtras*, 4, 1, 50, pp. 1537–1544 in Vol. IV of Jhā.

³⁶ See Shastri, 261.

³⁷ On this see Text 88 of the *Padārthadharmasaṅgraha*, pp. 301–304 in Jhā. This text, one of the longest in the *Padārthadharmasaṅgraha*, a very terse work, is also one of the most important passages in all Nyāya-Vaiśeṣika literature, since it contains the heart of their theory of the generation of wholes.

³⁸ See the *Tarkasaṃgraha-Dīpikā*, #27, p. 133 in Bhattacharya. On the nature of conjunction as being non-locus-pervading, see Potter, *Encyclopedia*, 114–115; Mohanty, *Classical Indian Philosophy*, 82. On technical aspects of the Nyāya-Vaiśeṣika distinction between locus-pervading and non-locus-pervading qualities that were developed by Gaṅgeśa, see Ganeri, *Philosophy in*, 87–89.

³⁹ See Texts 72–73 of the *Padārthadharmasaṅgraha* along with Śrīdhara’s commentary, pp. 223–224 in Jhā; see also Matilal, *Perception*, 286.

⁴⁰ See Thomas Reid, *Essays on the Active Powers of Man*, chapters 5–6, in *Inquiry and Essays*, ed. by Ronald E. Beanblossom and Keith Lehrer (Indianapolis: Hackett Publishing Company, 1983), pp. 304–313.

⁴¹ See Hirianna's comment that the Nyāya-Vaiśeṣikas (like Plato) thought that only souls, in virtue of their volitions, could be *initiators* of motion, material substances being, by nature, inactive. This notion played a key role in certain of their proofs for God's existence. M. Hirianna, *The Essentials of Indian Philosophy* (London: Harper Collins, 1985), 93–94.

⁴² See text 88 of the *Padārthadharmasaṅgraha*, along with Śrīdhara's luminous commentary, pp. 301–311 in Jhā.

⁴³ For an excellent brief account of the Nyāya-Vaiśeṣika causal theory, see Sarvepalli Radhakrishnan, *Indian Philosophy, Vol. II* (New York: Macmillan, 1927), p. 96.

⁴⁴ On these points we agree with David Wiggins, who expresses doubts concerning the distinction between any “serious” reductionistic account of living beings from an eliminativist account of them. See his *Sameness and Substance Renewed* (Cambridge: Cambridge University Press, 2001) p. 156, ft. 18.

⁴⁵ The main reductionist foes of the Nyāya-Vaiśeṣikas were the Buddhists, but some of the Cāravākas (Indian materialists), also held a reductionist account of composite material entities. On Cāravāka reductionism, see Sinha, *Indian Philosophy*, 270–273.

⁴⁶ Strictly speaking cats are not composite substances for the Nyāya-Vaiśeṣikas but rather accidental unities consisting of the soul of a cat conjoined with another the body of a cat. But the Nyāya-Vaiśeṣikas themselves often ignore this particular aspect of their doctrine and speak loosely of cats and cows and humans as “wholes,” even though, on their view, only the *bodies* of such kinds of “things” are wholes.

⁴⁷ For a detailed discussion of this kind of cause see Śrīdhara's commentary on Texts 71, 73 and 88 of the *Padārthadharmasaṅgraha*, pp. 222–224, 305–308 in Jhā.

⁴⁸ Śrīdhara's definition of the non-inherence cause (p. 222 in Jhā) is not a happy one since it applies only to the non-inherence causes of *certain* sorts of qualities and does not apply to the non-inherence causes of *substances*, even though Śrīdhara, like all Nyāya-Vaiśeṣikas, did recognize that composite substances have non-inherence causes.

⁴⁹ See Śrīdhara's commentary on Text 36 of the *Padārthadharmasaṅgraha*, pp. 70–71 in Jhā, and Udayana's *Kiranāvalī*, pp. 117–118 in Tachikawa.

⁵⁰ An anonymous reviewer for *The Canadian Journal of Philosophy* has also noted this difficulty with the Nyāya-Vaiśeṣika theory of wholes.

⁵¹ See Śrīdhara's commentary on Text 129 of the *Padārthadharmasaṅgraha*, p. 566 in Jhā.

⁵² See his article, "On Being in the Same Place at the Same Time," in *Material Constitution*, ed. Michael Rea (New York: Rowman & Littlefield, 1997), 3-8.

⁵³ The Nyāya-Vaiśeṣikas did not suppose that aggregates are real "things." According to them an army or a row of trees is nothing more than a number of substances related by certain non-monadic qualities. See Uḍḍyoṭakara's commentary on the *Nyāya Sūtras*, 1, 1, 14, Vol. I, pp. 257-258 in Jhā, and Shastri's commentary on it in *The Philosophy of Nyāya Vaiśeṣika*, 187.

⁵⁴ Wiggins, "On Being in the Same Place at the Same Time," 4.

⁵⁵ Rea, *Material Constitution*, xxix.

⁵⁶ See Shastri, *The Philosophy of Nyāya Vaiśeṣika*, 171-176, 239-240, 277-281.

⁵⁷ For their answer to the contact objection see Uḍḍyoṭakara's commentary on the *Nyāya Sūtras*, 4, 2, 25, Vol. IV, pp. 1623-1628 in Jhā. For their answer to the criterion objection, see Matilal's exposition of their theory of natural kinds in *Perception*, 417-425.

⁵⁸ On this see Matilal (1986), 378; Halbfass, 95; Vātsyāyana's commentary on 3, 1, 11 of the *Nyāya Sūtras*, Vol III, p. 1132 in Jhā; Śrīdhara's commentary on Text 36 of the *Padārthadharmasaṅgraha*, pp. 78-79 in Jhā.

⁵⁹ The Nyāya-Vaiśeṣikas certainly held that the relation of a whole to its parts is transitive. See Śrīdhara on Text 36 of the *Padārthadharmasaṅgraha* p. 77 in Jhā and Śaṅkara Miśra on IV, 1, 8 of the *Vaiśeṣika Sūtras*, pp. 151-152 in Sinha.

⁶⁰ An anonymous reviewer has helpfully pointed out that, given all that we have said so far, it would be consistent to suppose that a whole loses a proper part without also ceasing to inhere in it. Suppose, for example, that Bucephalus loses a skin cell at *t*. Although this supposition is inconsistent with the claim that Bucephalus inheres in that skin cell *as a whole in a part* at *t*, it is consistent with the claim that he inheres in that cell *as a universal or a property-particular* at *t*. Although this position is logically available, it entails the implausible thesis that the composite substance Bucephalus is either a universal or a property-particular at some time during his existence. It is thus natural to suppose—as the Nyāya-Vaiśeṣikas seem to have—that whenever a composite substance ceases to inhere in a part *as a whole in a part*, it ceases to inhere in that part *simpliciter*.

⁶¹ See Śrīdhara's commentary on Text 36 of the *Padārthadharmasaṅgraha*, pp. 77-78 in Jhā.

⁶² Of course, mereological essentialism is generally construed as the claim that *either* the loss of a part *or* the addition of a part is a sufficient condition for the destruction of an object. The Nyāya-Vaiśeṣikas endorsed the second disjunct as well (see Śrīdhara on Text 36 of the *Padārthadharmasaṅgraha*, p. 78–79 in Jhā), but discussion of the first disjunct is sufficient for us to make our point.

⁶³ Shastri, *The Philosophy of Nyāya-Vaiśeṣika*, 277–279.

⁶⁴ On this, see Halbfass, *On Being*, 95.

⁶⁵ John Locke, *An Essay Concerning Human Understanding*, Book II, chapter XXVIII, 4.

⁶⁶ Peter van Inwagen has recently developed a theory of the nature of living substances which is strikingly similar to Locke's. See his *Material Beings* (Ithaca: Cornell University Press, 1990), 143–146.

⁶⁷ See Aquinas, *De Ente et Essentia*, chapter 2, in *Aquinas; Selected Philosophical Writings*, edited and translated by Timothy McDermott, pp. 93–94.

⁶⁸ We should note that the number of the members of S or T need not be a specific *group* of individuals; that is, it could be (and probably always is) the case that either *this* group of the members of S numbering n (whatever number n is), or *that* group of the members of S numbering n, and so on, are necessary for the continued existence of a certain whole.

⁶⁹ See Śrīdhara's commentary on Text 38 of the *Padārthadharmasaṅgraha*, pp. 91–92; Mohanty, 44.

⁷⁰ See the *Padārthadharmasaṅgraha*, Text 154, pp. 651–653 in Jhā; Shastri, pp. 314–315.

⁷¹ See Shastri, *The Philosophy of Nyāya-Vaiśeṣika*, 314–316; Sinha, *Indian Philosophy*, 364.

⁷² It should be noted here that for the Nyāya-Vaiśeṣikas a simple substance is a substance that does *not* inhere in another substance. This entails, according to them, that every simple substance is eternal, never coming into or going out of existence. But they did *not* think it entails that every simple substance is *unextended*. Some simple substances, viz., atoms, are unextended, but souls, space and time have infinite extension, though no parts strictly speaking.

⁷³ *Padārthadharmasaṅgraha*, Text 156, pp. 671–673 in Jhā.

⁷⁴ See Śrīdhara's commentary on Text 7 of the *Padārthadharmasaṅgraha*, p. 30 in Jhā; Udayana, *Lakṣanāvalī*, # 203, p. 85 in Tachicawa.

⁷⁵ This means that individuators, like universals, inherence, and absences, though real and mind independent entities, do not, strictly speaking, *exist*, since only entities that instantiate the universal existenceness exist. See Phillips, *Classical Indian Metaphysics*, p. 50.

⁷⁶ See *Padārthadharmasaṅgraha*, Text 156, p. 672 in Jhā.

⁷⁷ See Ganeri, *Philosophy in*, 77–78; Radhakrishnan, *Indian Philosophy*, Vol. II, p. 216.

⁷⁸ We are indebted to Jonathan Stoltz, Jeffrey Brower, Michael Rota, and an anonymous reviewer for *CJR* for insightful criticisms of earlier drafts of this paper.