

## Lockean Operations

Matthew Stuart, *Bowdoin College*

Locke is a great philosopher, and no apology ought to be necessary for taking an unblinking look at both his successes and his failures. I have explored some of his successes elsewhere, arguing that his solutions to a number of metaphysical problems are more subtle, more consistent and more attractive than is generally recognized.<sup>1</sup> Here I propose to anatomize one of the failures – or rather, a short series of related failures. I will examine his accounts of three mental operations that he says we perform upon ideas to produce other ideas. He invokes the operations of compounding, abstraction, and comparing to explain our possession of complex ideas, abstract ideas, and ideas of relations, respectively. There are serious problems with his accounts of each of these operations. This is true even if we approach the *Essay* on its own terms, and in a spirit of charity. Not all of the problems are insuperable; but some of them go deep, and their solution would require fundamental alterations to Locke's system.

Compounding, abstraction and comparing do a great deal of the heavy lifting in Locke's empiricist theory of mind and knowledge. They shoulder the burden of explaining how ideas that are not the immediate deliverances of sensation or reflection nevertheless have their origins in experience. Despite the crucial roles these operations play, Locke's accounts of compounding and comparing have been relatively neglected by commentators. This is no doubt partly due to the fact that his remarks about these operations are fairly meagre, and at points obscure. Still, the important roles these operations play in his system justifies the effort to better understand the little that he does say about them. On the topic of abstraction Locke is more loquacious, and his account of that operation has received a good deal of critical attention ever since Berkeley. Yet

there is reason to revisit it as well. There are some insights that are to be gained only by considering Locke's accounts of these three mental operations together. Also, to recognize that his account of abstraction has received attention is not to say that it has received its due. I will show that Locke can be defended against recent charges that he waffles between two different accounts of abstraction, though I will also argue that the one account he does have is seriously flawed.

Some of the difficulties that we face in trying to understand and assess Locke's accounts of mental operations arise from foundational issues in his theory of ideas. What are "*Ideas*"? Are they mental images?<sup>2</sup> Acts of perception?<sup>3</sup> Appearances?<sup>4</sup> Intentional objects?<sup>5</sup> Or must we conclude, as many have done, that his use of the term '*Idea*' is perniciously ambiguous – that he waffles between thinking of ideas as images and thinking of them as concepts or something else?<sup>6</sup> Naturally, if "*Ideas*" are colour patches in one's visual field, then compounding them or "putting them together" is likely to mean something different than it does if "*Ideas*" are concepts. By the same token, if Locke waffles between different conceptions of "*Ideas*," we might expect him to vacillate between different conceptions of abstraction. Even if we do resolve the issue about what "*Ideas*" are, there are further issues about what it means for some of them to be simple and others complex, and about what it means for the complex ones to have the simple ones as parts. These are all important questions, but here I set them aside in order to explore aspects of Locke's theory of ideas that have received less attention. There are questions that come into view only when we narrow our focus some.<sup>7</sup> Because I do not want to assume any particular solutions to the foundational issues here, I will restrict myself to questions about compounding, abstraction and comparing that can be fruitfully explored however the foundational issues are resolved. There *are* some such questions. Considering these alone will

not give us the whole story about Locke's theory of ideas. But if we cannot find satisfactory Lockean answers to these questions, it almost does not matter what his "*Ideas*" are: his empiricist project will be threatened by failure or incoherence in any case.

### **Compounding**

The operation by which the mind "puts together several of those simple ones it has received from Sensation and Reflection, and combines them into complex ones" (II.xi.6) Locke variously refers to as 'compounding', 'combining' and 'composing'. The most peculiar aspect of his account of compounding is the scope that he accords this operation. One might expect him to say that ideas of cows and trees are passively received through sensation, but that some complex ideas – such as those of unicorns and angels – we must make ourselves from simpler components. Instead, what he says is that *all* complex ideas – and not just ideas of unobserved objects or events – are made by the mind putting simple ideas together. This is especially curious because Locke does not seem to be forced to this by his other commitments. His empiricism does not require him to say that the mind makes all complex ideas. He could say that all ideas are ultimately derived from experience, and yet allow that complex ideas of cows and trees are passively acquired through sense. Nor does his compositionism – his view that ideas are simple and complex and that the complex ones have simple ones as parts – force him to say that the mind makes all complex ideas. He could say that every idea is either simple or else a complex wholly composed of simples, and yet say that some complex ideas are passively received rather than put together. He could say these things, but he does not.

At II.ii.1, Locke explains that although "the Qualities that affect our Senses, are, in the things themselves, so united and blended, that there is no separation, no distance between them;

yet 'tis plain, the *Ideas* they produce in the Mind, enter by the Senses simple and unmixed.”

There is a real problem about what it means for the qualities of things to be “blended,” and another about what it means for the ideas they produce in us to be “unmixed.” What would it be for things to have *unblended* qualities? How would our experiences differ if things produced *mixed* ideas in us? However we answer those questions, it is clear from the quoted passage that Locke thinks that the ideas that enter by way of the senses are all simple ideas. Combining them into complex ideas is the mind’s work, as he says a bit later when he introduces the topic of complex ideas:

We have hitherto considered those *Ideas*, in the reception whereof, the Mind is only passive, which are those simple ones received from *Sensation* and *Reflection* before-mentioned, whereof the Mind cannot make any one to it self, nor have any *Idea* which does not wholly consist of them. But as the Mind is wholly Passive in the reception of all its simple *Ideas*, so it exerts several acts of its own, whereby out of its simple *Ideas*, as the Materials and Foundations of the rest, the other are framed. (II.xii.1)

In the correspondence with Stillingfleet, he makes the point again, in language as plain as can be: “all our complex, relative, and general ideas are made by the mind” (*Works* IV, 11).

Despite these very plain statements, some have portrayed Locke as holding that we passively receive at least some complex ideas through sensation. R. S. Woolhouse is one who does so. He cites II.xxii.9, where Locke lists three ways that we have of getting the complex ideas of mixed modes:

1. By Experience and *Observation* of things themselves. Thus by seeing two Men wrestle, or fence, we get the *Idea* of wrestling or fencing.
2. By *Invention*, or voluntary putting together of several simple *Ideas* in our own Minds: So he that first invented

Printing, or Etching, had an *Idea* of it in his Mind, before it ever existed. 3. Which is the most usual way, by *explaining the names* of Actions we never saw, or Notions we cannot see...

Woolhouse takes this to show that Locke thinks that the complex idea of fencing need not be “built up from experienced simples” (Woolhouse 1983, 51). However, what the passage shows is that Locke thinks that we can acquire the complex idea of fencing by watching men fence. It does not show that he thinks that we can acquire the idea of fencing without having to put simple ideas together. The contrast between 1 and 2 in the above passage is not the contrast between complex ideas passively acquired and complex ideas made by the mind. It is the contrast between combinations of simple ideas that are suggested by experience and combinations of simple ideas that are not.

Woolhouse also cites II.xii.1 in support of his contention that Locke allows that complex ideas are sometimes received directly from experience (Woolhouse 1983, 51). There Locke says that “simple *Ideas* are observed to exist in several Combinations united together.”<sup>8</sup> Woolhouse evidently takes this to mean that ideas *enter the mind* combined together. However, what Locke says is not that they enter in combination but that they are *observed to exist* in combination. He often speaks of us as “perceiving” the ideas in our minds, but ‘observing’ is a term he more often reserves for our sensory awareness of external things or properties.<sup>9</sup> This is one of those places where Locke says “ideas” and means “qualities”. He means that we observe qualities existing in several combinations united together. That does not imply anything about whether we have to combine simples in order to make our complex ideas of the things that have those qualities.

Peter Alexander goes so far as to suggest that for Locke it is *only* complex ideas that are directly received through sensation. He says that simple ideas are usually – and perhaps always

– the products of analysis (Alexander 1985, 106). One of the passages to which he turns for support is II.i.7, where Locke explains how our activities affect the ideas we get. There Locke begins by saying that we acquire more simple ideas of sense as we become conversant with a greater variety of objects, and that we acquire more ideas of reflection as we pay greater attention to the operations of our minds. So far this is just common sense, and does not entail that we originally acquire simple ideas by analyzing complex ones. Next Locke compares our situation to that of a man who looks at a picture or a clock every day, but who has a confused idea of its parts until he “*applies himself with attention, to consider them each in particular.*” Alexander evidently takes this to mean that complex ideas come easily, but that we acquire simple ideas only by the labor of analysis. This is to misconstrue the analogy. Locke is telling us that paying attention can remedy confusion, whether the confusion is about objects or about ideas. He does not imply that analysis is required for us to *get* simple ideas in the first place. The man does not acquire the parts of the picture or the clock by attending to them. What the man gets by attending is a better understanding of what the parts of the clock are and how they are related. The point of the analogy is that attention can give us a better fix on the ideas we have.

Alexander draws on other passages to support his reading, but to no better effect. For example, at one point he offers this reasoning about II.i and II.ii: “In the last section of Chapter i, Locke for the first time mentions simple ideas and he begins Chapter ii with the distinction between simple and complex ideas, making it clear that our apprehending of ideas *as simple* depends upon the discriminating ability of our minds” (Alexander 1985, 107). In fact, Locke mentions simple ideas long before the close of II.i – at II.i.7 – and nothing in II.i.25 or II.ii.1 suggests that we acquire simple ideas only by attending to, or analyzing, complex ideas.

The marginal heading for II.i.25 is: “*In the reception of simple Ideas, the Understanding is for the most part passive.*”<sup>10</sup> In the body of that section, Locke says this about how simple ideas are produced in the mind:

These *simple Ideas*, when offered to the Mind, *the Understanding can* no more refuse to have, nor alter, when they are imprinted, nor blot them out, and make new ones in it self, than a mirror can refuse, alter or obliterate the Images or *Ideas*, which, the Objects set before it, do therein produce.<sup>11</sup>

It would be hard to think of a clearer example of passivity than the mirror’s acceptance of the images produced on its surface. When, early in the next chapter, Locke explains how simple ideas are acquired, he does not say that they are produced by attention or analysis. He says that “[t]hese simple *Ideas*...are suggested and furnished to the Mind, only by those two ways about mentioned, *viz. Sensation and Reflection*” (II.ii.2).

It is difficult to know how to understand Locke’s claim that we are passive in our reception of simple ideas of sensation and reflection, and yet active in the production of complex ideas even of sensed objects. Unlike many of his scholastic contemporaries, he does not think that sensory ideas are items that literally enter the mind from outside our bodies; he thinks that they are produced in the mind consequent to the impact of particles upon our sense organs (II.viii.11).<sup>12</sup> So the distinction between passive reception of simple ideas of sensation and the active making of complex ideas of sensed objects seems to be a distinction between two different ways in which the impact of particles upon our sense organs precipitates our having ideas. One way of understanding the difference would be to suppose that making a complex idea out of several passively received simple ones is a full-fledged mental action. For it to be a full-fledged action, on Locke’s view, would be for it to involve a volition directed at bringing about a mental

event.<sup>13</sup> This would put the making of the complex idea of a perceived object on a par with such mental actions as adding a string of numbers in one's head, or trying to remember a name. That might not be terribly implausible as an account of how one makes the idea of God, or of how one makes the idea of an imaginary creature such as a feathered rabbit. It *does* seem terribly implausible to suppose that every time one sees an apple one *wills* the combining of simple ideas of redness and roundness and so forth into the complex idea of that apple.

Perhaps it will be suggested that Locke does not think that we need to "make" the complex idea of an apple every time we perceive or think about an apple. He might think that we do this once – or a few times even – early on in our experience, and afterwards retain the idea in our minds for later use. We must be a bit careful here, as Locke does not hold that ideas stored in memory are "in the mind" in the same sense as are the ideas of things currently sensed. He says, "this *laying up* of our *Ideas* in the Repository of the Memory, signifies no more but this, that the Mind has a Power, in many cases, to revive Perceptions, which it has once had, with this additional Perception annexed to them, that it has had them before" (II.x.2). On the other hand, Locke also does not think that one has to be looking at something yellow in order to think about the colour yellow: once the simple idea of yellow has "entered" the mind by way of the senses, nothing more is required to explain one's ability to think thoughts of yellow things. So in the same way, he might think that once one has made the complex idea of an apple by combining the relevant simple ideas, nothing more is required to explain one's later employment of that idea. Locke certainly does think that one can acquire and then store in memory the general idea "apple". As we shall see, he thinks that doing this requires first having some detailed ideas of particular apples. Detailed ideas of particular apples can be stored in memory too. The trouble is that this still leaves Locke needing to account for the compounding of the detailed complex

idea that one has when one sees a new particular apple, an apple that one has not seen before.

That detailed complex idea is not the general idea “apple”; nor is it an idea that can be retrieved from memory.

There is a tempting alternative. Though Locke talks of us as “making” all complex ideas, he may not think of this “making” as a full-fledged action in the sense that entails volition.

Nicholas Jolley offers an attractive way of thinking about Locke’s view of sensation. He suggests that Locke thinks of the activity of uniting several simple ideas together as rather like what one does when one sees stars in the sky *as* a familiar constellation:

It is the mind that determines which stars to include and which to omit; indeed, it imposes the particular pattern implied by such names as The Plough and Orion. In the same way there is a sense in which certain simple ideas are contiguous by virtue of their causal link to a physical object; the ideas of colour, scent, and touch are causally anchored in the rose. But it is still my mind alone which combines them into a single complex idea.

(Jolley 1999, 47).

What is it that we do when we see a cluster of stars *as* a constellation, or a cluster of sensible properties *as* a rose? Part of Locke’s answer to this question seems to be that we combine the ideas of those parts or those properties with the idea of substance or substratum.<sup>14</sup> There may also be another aspect to seeing something *as* a constellation, or *as* a rose: seeing something as belonging to a *kind*, such as “constellation” or “rose”. For Locke, this would mean recognizing that something falls under a certain nominal essence.

A nice feature of Jolley’s analogy is that it suggests a way out of the worries about the role of volition in perception. For the kind of recognitive seeing that Jolley is talking about can be said, with some plausibility, to be mostly dispositional. Perhaps there are some cases in

which seeing something *as* this or that involves genuine activity on the observer's part. We might want to say that about a case in which one makes a conscious effort to see Orion *as* a hunter, or to see a duck/rabbit drawing *as* a rabbit. Generally speaking, however, to see a cluster of sensible qualities *as* a single thing of some sort is to form certain expectations about the cluster, and perhaps to be disposed to talk and sort in certain ways. To see a colour, a scent and a felt shape *as* a rose is to expect those sensible qualities to travel together, and perhaps to expect them to be conjoined with certain other qualities. It is also to be disposed to answer in certain ways questions about which properties belong to which things ("Is that your perfume I smell?" "No, it's the rose I'm holding"). Although seeing a cluster of sensible qualities *as* a rose is not a mental activity in the full-fledged sense – not an activity in the way in which doing a math problem in one's head is an activity – it is in a looser sense something that the mind *does* rather than something that happens to it. The difference between just seeing the qualities and seeing them *as* a rose has to do with the mind's contribution rather than the world's.

Promising as this account is, it contains a fatal flaw, and one that brings us in the vicinity of our next mental operation, abstraction. If seeing a cluster of sensible qualities *as* a rose involves, among other things, seeing something or other (the cluster of qualities, or the item partly constituted by that cluster) as falling under the nominal essence "rose", then seeing a cluster of sensible qualities *as* a rose is something one can do only if one has the abstract idea "rose". Locke's nominal essences are abstract ideas. The problem is that he thinks of abstraction as a process whose raw materials are complex ideas. He thinks that one can acquire the abstract idea "rose" only if one first has complex ideas of particular roses. So it looks as though the Lockean story that we are considering could never get going. The proposal is that making the idea of a particular rose involves seeing a property cluster (or an item partly

constituted by such a cluster) *as* a rose. Yet it seems that one can do this only if one has the general idea “rose”, and Locke’s account of how we get *that* general idea presumes that we must first have access to the complex ideas of several particular roses.

A possible response is to deny that seeing a cluster of sensible qualities *as* a single thing (or *as* partly constitutive of a single thing) necessarily involves seeing it as belonging to any specific kind. It might be said that Locke thinks that we make several simple ideas of sensation or reflection into a complex idea when we see the qualities they stand for *as* constituting (or partly constituting) a single unified thing. It might be denied that this necessarily involves seeing that thing *as* a rose (or even *as* a flower, or *as* a plant). The trouble is that this relocates our problem, rather than solving it. For Locke, to see something as a single unified thing – as more than just a collection of qualities – is to see it as a substance. On the proposed reading, we avoid the difficulty about how we acquire the idea “rose,” but we face a difficulty about how we acquire the idea “substance”. Just as seeing a cluster of sensible qualities *as* a rose would require already having the idea “rose”, so seeing a cluster of such qualities *as* a substance (or *as* partly constituting a substance) would require already having the idea “substance”. In his first letter to Stillingfleet, Locke says that the general idea of substance is “a complex idea, made up of the general idea of something, or being, with the relation of a support to accidents” (*Works* IV, 19). There and in the *Essay* he says that this idea is made by abstraction (*Works* IV, 16; III.iii.9). Yet, as I shall show in the next section, if the general idea “substance” is a complex idea acquired by abstraction, it must be derived from a larger complex idea from which it is extracted. On the account of compounding that we are considering, Locke cannot explain how one makes the complex idea from which one extracts the general idea “substance”.

## Abstraction

Locke's *Essay* contains two main discussions of abstraction. The first is relatively brief: a single section (II.xi.9) in a grab-bag chapter that also contains descriptions of other mental operations (including compounding and comparing) and observations about the abilities of "Brutes," "Idiots" and "mad Men." The second, more sustained discussion comes at III.iii.6-9, in a chapter about general terms. The issue of abstraction arises there because of Locke's view that "[w]ords become general, by being made the signs of general *Ideas*" (III.iii.6). He holds that it is only words and ideas – "signs" – that can properly be called "general." Something's being general is not a matter of its being wholly present at more than one place at a time. Locke holds that "universality belongs not to things themselves, which are all of them particular in their Existence" (III.iii.11). Something's being general is a matter of what it represents: a word or idea is general if it applies to more than one thing. Usually it is ideas that Locke calls "abstract," though he does draw a distinction between abstract and concrete terms or names (III.viii.1-2). That an idea is abstract does not mean that it is a non-particular, but that it is the product of abstraction, a mental operation that produces general ideas.

Locke precedes both of his discussions of abstraction with the observation that we need general names, and hence general ideas, because it would be impossibly cumbersome to have a name for every thing we might want to talk about. In his first discussion of abstraction, he goes on to say this about how the mind makes general ideas:

[T]he Mind makes the particular *Ideas*, received from particular Objects, to become general; which is done by considering them as they are in the Mind such Appearances,

separate from all other Existences, and the circumstances of real Existence, as Time, Place, or another other concomitant *Ideas*. (II.xi.9)

We find very similar language toward the beginning of his second discussion of abstraction, where he says that “*Ideas* become general, by separating from them the circumstances of Time, and Place, and any other *Ideas*, that may determine them to this or that particular Existence” (III.iii.6).

Despite the initial similarities between Locke’s two main discussions of abstraction, some have said that he offers different accounts of abstraction in Book II and Book III. Jonathan Bennett has suggested that in the passage from II.xi.9 just quoted, Locke is telling us that one makes a general idea by separating one’s idea of an object from ideas of the object’s surroundings and attendant circumstances. On this account, Bennett says:

I could start with my fully detailed sensory idea of a horse that I see galloping in the meadow and peel off from it any representation of the ‘circumstances’ – the coolness of the wind, the drumming of the hooves, the scent of the heather, the feel of my grandson’s hand in mine – while still retaining a fully detailed idea of the horse itself. (Bennett 2001, 2: 16)

One hesitates to call this an account of abstraction at all. The output is an idea of a horse that is fully detailed except that it does not include representations of the horse’s whereabouts, or of its relations to other things. Since there seems to be good reason to set aside such properties as “being in a meadow” as not genuine properties of the horse – as mere “Cambridge” properties of it – it seems right to say, as Bennett does, that the output of this process is a fully detailed idea of a horse. If anything has been rendered general by this process, it would seem to be not the

representation of the horse, but the representation of the state of affairs of which the horse was one element.

Bennett sees the account at II.xi.9 as out of line with Locke's usual way of thinking about abstraction. He says that usually when Locke writes about abstraction, it is to describe a process that yields ideas that are not fully detailed, ideas that are "qualitatively thinned out" (Bennett 2001, 2: 16). This second account of abstraction Bennett finds in Locke's account of how children produce the idea "man":

The *Ideas* of the Nurse, and the Mother, are well framed in their Minds; and, like Pictures of them there, represent only those Individuals. The Names they first give to them, are confined to those individuals...Afterwards, when time and a larger Acquaintance has made them observe, that there are a great many other Things in the World, that in some common agreements of Shape, and several other Qualities, resemble their Father and Mother, and those Persons they have been used to, they frame an *Idea*, which they find those many Particulars do partake in; and to that they give, with others, the name *Man*, for Example. And *thus they come to have a general Name*, and a general *Idea*. Wherein they make nothing new, but only leave out of the complex *Idea* they had of *Peter* and *James*, *Mary* and *Jane*, that which is peculiar to each, and retain only what is common to them all. (III.iii.7)

Locke seems to be saying that a child first acquires fully detailed ideas of a number of individuals, then notices similarities among the individuals, and finally fashions an idea that includes just what is common to them. On this account of abstraction, the product is an idea that applies to a number of different people, doing so in virtue of the fact that it represents features they have in common without representing the features that distinguish them.

Bennett's reading of II.xi.9 depends on the supposition that the ideas Locke speaks of as being "received from particular Objects" and then considered "separate from all other Existences" are fully detailed ideas of objects. However, the example that Locke gives later in that paragraph suggests something else:

Thus the same Colour being observed to day in Chalk, or Snow, which the Mind yesterday received from Milk, it considers that Appearance alone, makes it a representative of all of that kind; and having given it the name *Whiteness*, it by that sound signifies the same quality wheresoever to be imagin'd or met with; and thus Universals, whether *Ideas* or Terms, are made. (II.xi.9)

Here the fully detailed ideas of objects that are given by sensation are the ideas of the chalk, the snow, and the milk. Yet the idea that Locke is thinking of as being made general by separating it from "all other Existences" is not one of these. It is the idea of whiteness, an idea that is "received from particular Objects," but an idea that is a *component* of the fully detailed ideas of the chalk, the snow and the milk. Generalizing from this example, we do not get the suggestion that one produces the general idea of a horse by isolating the fully detailed idea of a particular horse from representations of that horse's surroundings. Instead, we get the suggestion that one produces the general idea of a horse by isolating one *component* of a fully detailed idea of a particular horse from the other components of that idea. Locke's account of abstraction thus depends crucially upon his compositionism. What gets separated, or considered separately, is part of a complex idea.

The thesis that abstraction is the isolation of one part of a complex idea is also what we find in Book III. In the passage from III.iii.7 quoted above, Locke says that children acquire the idea "man" by leaving things out of complex ideas of particular people. "Leaving out" the

*complement* of a component idea would be one way of isolating that component. In the next section, he goes on to describe how the process can be repeated, isolating a component of the idea “man” to yield an even more general idea. The idea “animal” is gotten by “leaving out the shape, and some other Properties signified by the name *Man*, and retaining only a Body, with Life, Sense, and spontaneous Motion” (III.iii.8). In the next section, Locke says that “general Natures or Notions” are nothing but “abstract and partial *Ideas* of more complex ones, taken at first from particular Existences” (III.iii.9). The claim that general notions are “partial *Ideas* of more complex ones” means not that general notions are ideas of ideas, but that general notions are parts of complex ideas, which complex ideas have more parts than those general ideas do.

Vere Chappell is another who says that Locke tells two different stories about abstraction.<sup>15</sup> Like Bennett, he says that Locke describes one operation in Book II, and a different one in Book III. Chappell says that both of these operations take as their inputs a complex idea such as might result from the visual experience of seeing one’s mother. According to Chappell, the operation described in Book II involves picking out one component of that complex idea, such as the simple idea of the colour of the mother’s skin, and focusing on it alone. The operation described in Book III could begin with the same complex idea, but in this case the mind “proceeds by removing several components from this complex idea, say the simple ideas of the mother’s colour, shape, size, and such, while keeping its attention on the original idea, or what is left of it, which is now no more than the idea of a woman – some woman or other” (Chappell 1994, 39-40). The difference between the two operations would seem to be as follows. First, the output of the Book II process is a simple idea, whereas the output of the Book III process is a complex idea. Second, the Book II operation involves *focusing on* a component

of the original complex idea, while the operation described in Book III involves *removing the complement of* a component of the original complex idea.

Is Chappell right that abstraction in Book II and in Book III are different operations? Let us consider the purported differences one at a time. First, are the operations described in Books II and III different because they have different outputs? Not necessarily. If complex ideas are ultimately composed entirely of simple ideas somehow united, then the difference between a process that has a complex idea as its output and one that has a simple idea as its output might be due not to the fact that different operations are involved, but to the fact that a single operation is carried further in one case than in another. If abstraction involves focusing on part of a complex idea, we can imagine focusing on a molecule-sized part or focusing on an atom-sized part. If abstraction involves removing the complement to part of a complex idea, we can imagine removing the complement of a molecule-sized part or removing the larger complement of an atom-sized part. So Locke may have a single operation in mind, and yet think that it can produce either complex ideas or simple ideas as outputs.

Next consider whether we must say that Locke has two different accounts of abstraction because he sometimes thinks of abstraction as a matter of focusing on part of a complex idea, and at other times thinks of it as isolating part of a complex idea by removing that part's complement. The evidence is less than compelling. The language suggesting selective attention could be a way of talking about the results of "removing" or "taking away" ideas. At II.xi.9, Locke says that the mind makes abstract ideas by "considering them as they are in the Mind such Appearances, separate from all other Existences...or any other concomitant *Ideas*." Might he not think that the way to consider a component idea "separate from" other concomitant ideas is to *separate* it from them? In that same passage, he says that when one abstracts the idea of white

from the idea of chalk or from the idea of snow, one “considers that Appearance alone.” Might he not think that the way to consider the appearance of white alone is make it *be* alone in the mind?

One could also argue that both in Book II and in Book III Locke is thinking of abstraction as selective attention. After all, what does it mean to separate one part of an idea from its complement, or to leave out part of a complex idea? Might it not be that when one focuses on part of a complex idea to the exclusion of the rest, one has “separated” it from its complement, and “left out” its complement? In fact, there is a positive reason for thinking that this is how Locke thinks about the matter. For he holds that ideas “cease to be anything, when there is no perception of them” (II.x.2). If selectively attending to part of a complex idea means excluding the complement of that part from the scope of one’s consciousness, then Locke will say that selectively attending to one part of a complex idea makes its complement “cease to be any thing.” Selectively attending to part of a chair does not make the other part vanish; but Locke’s view is that selectively attending to part of the idea of a chair *does* make the other part cease to be. Thus selectively attending to an idea and removing its complement come to the same thing.

Though Locke can be defended against the charge of having two different accounts of abstraction, there are problems with the one account that he does have. One apparent problem is that in cases where the output of abstraction is a simple idea, that output is an idea that the subject already has. Abstraction takes as its input a complex idea in the subject’s possession, and all complex ideas are supposed to be made by the subject compounding simple ideas. It follows that abstraction can yield new ideas, but only new complex ones. A person who receives simple ideas A, B and C, and compounds them to make the idea ABC, can make the new idea AC by abstraction. However, when the product of abstraction is a simple idea, it can only be an idea

that the subject had already acquired through sense or reflection. Abstracting to produce simple ideas would seem to be superfluous.<sup>16</sup>

There is a plausible Lockean reply to this objection. He does not think of abstraction as a way of getting new simple ideas. Nor does he really think that the point of abstraction is to make abstract ideas. Abstract ideas are just ideas produced by the process of abstraction, and they need not differ intrinsically from ideas gotten in other ways. This is evidenced by the fact that the *same* simple idea – the idea of white, for instance – can be received by sense or arrived at by abstraction. The point of abstraction is to make ideas that are general in their signification, ideas that supply the meanings of general terms. Abstracting involves focusing one’s attention on an idea and isolating it from others. Locke may well hold that it is only by focusing one’s attention on an idea and distinguishing it from others that one comes to be in a position to associate it with a term, to treat it as a standard that defines a kind. So although abstraction is not required to make a simple idea, he may well think that it is required to turn a simple idea into a general idea.

A more serious difficulty is that Locke’s account of abstraction is unable to do some of the work required of it. Abstraction is supposed to account for our possession of the ideas that supply the meanings of general terms. A general idea performs its function by representing one or more features that the members of a kind have in common, and by *not* representing the features that distinguish those members from one another. The trouble is that there are cases in which a general term is clearly meaningful, and yet the operation that Locke describes cannot account for the creation of the idea that would supply its meaning.

For instance, it does not look as though Locke can explain our possession of such ideas as “colour” and “sound”. These are ideas of kinds whose members are the items represented by simple ideas. To reach the idea “red” by abstraction we are supposed to start with the idea of

some red *thing*, and then isolate just one proper part of it, the part that is also a component of the ideas of other red things. We cannot perform this maneuver on the idea “red” itself to arrive at the idea of something that red and green have in common, because the idea “red” is simple and so does not have any proper parts to isolate. Locke himself sees the problem, and offers a solution:

There is nothing can be left out of the *Idea* of White and Red, to make them agree in one common appearance, and so have one general name....And therefore when to avoid unpleasant enumerations, Men would comprehend both *White* and *Red*, and several other such simple *Ideas*, under one general name; they have been fain to do it by a Word, which denotes only the way they get into the Mind. For when *White*, *Red*, and *Yellow*, are all comprehended under the *Genus* or name *Colour*, it signifies no more, but such *Ideas*, as are produced in the Mind only by the Sight, and have entrance only through the Eyes. (III.iv.16)

This is another of those passages in which Locke is careless about the distinction between ideas and qualities. Taking Locke’s remarks at face value, he is telling us that the content of the idea “colour” is “idea produced only by sight.” However, reading the passage this way means saddling him with the view that colours *are* ideas, which is in conflict with his repeated characterizations of them as powers that bodies have to produce ideas in us.<sup>17</sup> We do better to understand this passage as saying either that the content of the idea “colour” is “*quality* sensed only by sight,” or else that the content of the idea “*idea* of colour” is “idea produced only by sight.” These two formulations should come to the same thing. For the sake of simplicity I will focus on the second one. I will take Locke to be saying that what ideas of colours have in common is just that they are produced in us only by the stimulation of certain organs, our eyes.

For Locke's solution to work, it must be a conceptual truth that ideas of colours are produced only by the stimulation of our eyes. The trouble is that even if it is true that ideas of colours are produced only by the stimulation of our eyes, this seems a contingent matter. We can imagine a person whose eyes are defective, so that stimulation of them has never produced any ideas, but who also happens to be wired differently from the rest of us. She has receptor cells in the palms of her right hand, and when she holds that hand over a surface, she has an experience that is subjectively indistinguishable from the experience an ordinary sighted person has when looking at that surface. It would seem arbitrary and implausible for Locke to deny that such a person has ideas of colours.

Locke could respond by granting that the person I have described has ideas of colours, but also insisting that the palm of that person's right hand *is* an eye. In that case, however, the threat of circularity looms. Locke would be saying that the criterion for an idea's being *of colour* is its being produced only by sight; yet he would also be presuming that the criterion for something's being an eye is for its stimulation to produce what we recognize as ideas of colours. His solution fails to do justice to the fact that experiences as of colours have a subjective phenomenology common to them, a phenomenology that they do not share with experiences as of other qualities, and one that seems to be a defining feature of them. (Consider another sort of person, one who is blind but able to discriminate the colours of surfaces when they are pressed against her eyes. To her, red things feel hot and bumpy on her eyes, blue things feel cool and smooth, green things feel warm and vibrating. I suspect that Locke would be unwilling to allow that such a person has ideas of colours.) If experiences with the correct phenomenology are systematically occasioned by the presence of colours, nothing more seems necessary for them to *be* experiences of colours. In particular, it does not seem to matter what organ produces them.

Locke's account of our idea "colour" also makes it a conceptual truth that ideas produced only by the stimulation of our eyes are ideas of colours. Here too there may be a problem. In responding to Molyneux's problem, Locke says that "the Blind Man, at first sight, would not be able with certainty to say, which was the Globe, which the Cube, whilst he only saw them: though he could unerringly name them by his touch" (II.ix.8). This seems to entail that the ideas of shapes that are produced in our minds by the stimulation of our eyes are not the same ideas as the ideas of shapes that are produced in our minds by the stimulation of our hands. If that is right, then it would seem that ideas of visual shapes are produced only by the stimulation of our eyes. These ideas are presumably not ideas of colours, even if ideas of visual shapes and of colours are necessarily produced together by the same visual stimulations.

Even if Locke can account for our possession of the idea "colour", his account of abstraction fails to explain our possession of many other general ideas. For him, complex general ideas, like complex ideas generally, are ultimately composed of simple ideas acquired through sense and introspection. Yet many general terms stand for kinds that cannot be defined in terms of shared clusters of sensible or introspectible properties. Consider the idea "male". The extension of 'male' includes some human beings, but also some dogs, hummingbirds, fish and insects. Any collection of observable qualities that is rich enough to discriminate between male and female hummingbirds – to include the former and to exclude the latter – is almost sure to exclude male human beings, male dogs and male insects. The observable features that male hummingbirds possess and that female hummingbirds lack are not observable features shared by the males of every other species.<sup>18</sup> The problem for Locke's account is even more obvious if we suppose that the observable features represented by the idea "male" should be ones that have actually been observed by everyone who possesses the idea "male": sexing hummingbirds can be

a tricky business. The important point here is not one that depends upon biological trivia. It is that there are many general kinds that cannot be defined in terms of clusters of observable or introspectible features shared by all and only their members. There is no set of observable or introspectible features that all and only *philosophers* have in common, or that all and only *timepieces* have in common, or that all and only *heroes* have in common, though Locke must surely allow that we have the general ideas “philosopher,” “hero” and “timepiece”.

### **Comparing**

Locke says that “comparing” is the operation by which we make ideas of relations. His account of relations is underdeveloped, and his remarks about ideas of relations leave many unanswered questions. Locke says that relation is “not contained in the real existence of Things, but something extraneous, superinduced” (II.xxv.8). Unfortunately, that is nearly all he has to say about the status of relations.<sup>19</sup> *Ideas* of relations he describes as being “made up of” simple ideas (II.xxv.8, 11), as “terminating in” simple ideas (II.xxv.9; II.xxvi.6; II.xxviii.18), and as being “concerned about” simple ideas (II.xxv.9). One wonders whether being made up of, terminating in, and being concerned about are all supposed to be the same relation. Locke does not offer much help.

At II.xxvi.6, after giving examples of some terms that signify relations, Locke declines to explain how the ideas these terms stand for “terminate in” simple ideas of sensation and reflection. He declines on the grounds that it is “too obvious to need any explication.” He is only a bit more helpful when the issue comes up again at II.xxviii.18. There he says that “when a Man says, Honey is sweeter than Wax, it is plain, that his Thoughts in this Relation, terminate in this simple *Idea*, Sweetness.” One way of reading this is as saying that the idea “sweeter” is a

complex idea that contains the simple idea “sweetness” as a part.<sup>20</sup> There is indeed strong evidence that Locke takes ideas of relations to be complex ideas. In the chapter called “Of *Complex Ideas*,” he offers ideas of relations as one of three categories of complex ideas, the others being ideas of substances and ideas of modes (II.xii.3,7). Taking stock later on, he reminds us that he has considered the difference between simple and complex ideas, and “observed how the complex ones are divided into those of Modes, Substances and Relations” (II.xxix.1). Still later, he characterizes ideas of modes and relations as “Collections of simple *Ideas*, that the Mind it self puts together” (II.xxxi.14). If the idea “sweeter” is a complex idea having the simple idea “sweetness” as a part, then there are questions to be raised about the idea “sweetness,” about the other components of “sweeter”, and about the union of those components into a single complex idea. Let us take these in turn, beginning with the simple idea “sweetness”.

In a passage added to the fourth edition of the *Essay*, Locke says that the process by which the mind gets ideas of relations involves “bringing two *Ideas*, whether simple or complex, together; and setting them by one another, so as to take a view of them at once, without uniting them into one” (II.xii.1). Putting this together with the example from II.xxviii.18, it would seem that the complex idea “sweeter” is gotten by considering the idea of honey and the idea of wax, but that the ideas of these relata do not enter into the idea “sweeter” as parts. What about the simple idea “sweetness” that *is* apparently a part of the complex idea “sweeter”? Is it also a part of the ideas of the honey and the wax? If it is, then although ideas of relata do not enter into ideas of relations as parts, *parts* of ideas of relata may enter into ideas of relations as parts. On the other hand, since the honey is sweeter than the wax, and since Locke seems to equate having a sensory experience of X with having the idea of X,<sup>21</sup> he might need to deny that the idea of

sweetness that is part of the idea of the honey is the same idea of sweetness that is part of the idea of the wax. He might need to say that it is the idea of one particular degree of sweetness that is a component of the idea of the wax, and that the idea of a different degree of sweetness is part of the idea of the honey. If these ideas of particular degrees of sweetness are different simple ideas, and if the simple idea “sweetness” that is part of the idea “sweeter” is not the idea of any particular degree of sweetness, then we run into a problem like the one we encountered in connection with the idea “colour”. The simple ideas of particular degrees of sweetness will not have proper parts that could be left out or taken away to make a more generic simple idea of sweetness, so Locke will be unable to account for our possession of this generic idea “sweetness”.

If the simple idea “sweetness” is one part of the complex idea “sweeter”, what are its other parts? Whatever they are, it seems clear that it must be these other parts that account for the complex idea being the idea of a *relation*, since “sweetness” could just as well be a component of the idea of a mode or of the idea of a substance. Yet here Locke faces a real problem. In order for a component of the idea “sweeter” to account for the fact that the idea “sweeter” is the idea of a relation, it would seem that this component must itself be the idea of a relation. Perhaps Locke thinks that the components of the idea “sweeter” might be the ideas “sweetness” and “more than.” In that case, we have really just postponed the question of how ideas of relations are made from simple ideas of sensation and reflection. We broached that issue by asking about the origin and composition of “sweeter”; we face it again when it comes to explaining the origin and composition of “more than”. At the end of the day, Locke’s compositionism forces him to cash the check: since he thinks that ideas of relations are complex ideas, and that complex ideas are ultimately composed of simple ideas, he is committed

to saying that each idea of a relation is ultimately wholly composed of ideas that are not ideas of relations. He is stuck with the problem of explaining how components that are not ideas of relations add up to the idea of a relation, and this is a problem that he does not even begin to address.

Another serious question is why Locke thinks that a distinctive operation – comparing – is needed to account for our possession of complex ideas of relations. His compositionism and his empiricism together require that the ultimate constituents of any complex idea be simple ideas passively received through sensation and reflection. Why do abstraction and composition not suffice to account for every possible arrangement of such simples, including those that are supposed to constitute ideas of relations?

These problems suggest that Locke might have been better off saying that ideas of relations – or at least those of certain fundamental relations – are simple ideas. Of course, saying this would likely raise ontological questions about relations that Locke might prefer to avoid. Another fix would be to say that ideas of relations are *sui generis*, and are neither simple nor complex. Quite a number of commentators suggest that Locke came to this conclusion himself. They say that he became aware of the inadequacies of his handling of ideas of relations, and consequently relaxed his commitment to compositionism.<sup>22</sup> The fullest case for this is made by Richard Aaron. He says that in the first three editions of the *Essay*, Locke espouses a robust compositionism according to which every idea is either simple or complex, and every complex idea is wholly composed of simple ideas. Within that framework, he reckons ideas of relations and also some abstract ideas to be complex ideas. However, Aaron says that in the fourth edition of the *Essay* Locke jettisons the idea that the simple/complex distinction is exhaustive. Instead, he comes to embrace a fourfold classification: simple ideas, complex ideas, ideas of relation, and

general ideas (Aaron 1971, 113). On this picture, ideas of relations are neither simple nor complex. They belong to a category all their own, and are made by a distinctive process that is not reducible to any combination of compounding and abstracting.

Notice that if Locke does retreat from compositionality, as Aaron suggests, this does not mean that ideas of relations no longer present a problem for him. Even if ideas of relations belong to a category of their own, Locke's empiricism imposes upon him the burden of explaining how they are derived from experience. Compositionality at least offers him a strategy for explaining how come by ideas that are not immediately delivered by experience. It allows him to say that ideas of very small things, ideas of imaginary creatures, abstract ideas, and perhaps ideas of relations, are all new arrangements of the materials that experience does deliver to us directly. If, on the other hand, ideas of relations are neither simple nor complex, then our possession of them seems a mystery.

Aaron's case that Locke retreated from compositionality rests on two changes made to the *Essay's* fourth edition. The first comes at II.i.5, where Locke contends that we have not "the least glimmering" of any ideas that cannot be traced back to sensation and reflection. In the first three editions, he says that after taking a full survey of our ideas and "their modes, and the Compositions made out of them," we shall find nothing in the mind that did not enter by one of those two ways. In the fourth edition, he instead says that after taking a full survey of our ideas and "their several Modes, Combinations, and Relations," we shall find nothing in the mind that did not enter by one of those two ways. This change is at best mildly suggestive; it is certainly far from conclusive evidence of a change in Locke's attitude toward compositionality. The fourth edition language is completely consistent with the view that ideas of relations are complex ideas that have simple ideas as parts.

The second, and more important, passage to which Aaron points is the opening section of II.xii, “*Of Complex Ideas*”. In the fourth edition, a good deal of new material was added to II.xii.1, including this passage, a portion of which I quoted earlier:

The Acts of the Mind wherein it exerts its Power over its simple *Ideas* are chiefly these three, 1. Combining several simple *Ideas* into one compound one, and thus all Complex *Ideas* are made. 2. The 2*d.* is bringing two *Ideas*, whether simple or complex, together; and setting them by one another, so as to take a view of them at once, without uniting them into one; by which way it gets all its *Ideas* of Relations. 3. The 3*d.* is separating them from all other *Ideas* that accompany them in their real experience; this is called *Abstraction*: And thus all its General *Ideas* are made.

Here it does seem that Locke is giving us one operation to account for all complex ideas, another to account for all ideas of relations, and a third to account for all abstract or general ideas.

Taking this passage in isolation, it is natural to assume that these three categories of ideas are meant to be mutually exclusive, and this yields Aaron’s fourfold classification of ideas. There are however, serious problems with Aaron’s reading.

One problem is that on Aaron’s reading it is not only ideas of relations, but also abstract ideas, that are neither simple nor complex. The material added to II.xii.1 does give parallel treatments to the two kinds of ideas, and it would be arbitrary to see it as evidence of a change of heart about the one and not the other. Yet in every edition of the *Essay* Locke gives an account of abstraction on which abstract ideas *must* be simple or complex. Abstract ideas are parts of the complex ideas from which they are derived, and all complex ideas are made by the mind compounding simple ideas. The parts of complex ideas that abstract ideas are can only be simple ideas or compounded collections of simple ideas.

Another problem with Aaron's reading is that just as Locke added material to the fourth edition, so he retained passages in which he says quite explicitly says that ideas of relations are complex ideas. These have already been cited above. Two of these passages – II.xii.3 and II.xii.7 – appear in the same chapter as the new material that we are discussing. Aaron is, of course, aware of these passages. He notes that “it is to be regretted that Locke did not rewrite Book II with this new classification in mind” (Aaron 1971, 113). Aaron would have us believe that Locke changes his mind about a basic feature of his theory of ideas, indicates this in one or two places, but is too lazy or too muddled to rewrite the four or five passages explicitly asserting the view he now rejects, even though some of these passages appear within a page or two of the changes he is making. This strikes me as unlikely. It seems to me far likelier that while revising his book years after its initial publication, Locke added a passage that poorly expressed his real commitments. However, it may be that we need say neither of those things. For it may be that the material added to II.xii.1 can after all be reconciled with the rest of the *Essay*.

We can accommodate the material that Locke added to II.xii.1, and yet avoid the result that complex ideas, ideas of relations and abstract ideas belong to mutually exclusive categories, so long as we ascribe to him the view that some ideas are made by more than one mental operation. Thus he might think that all complex ideas are made by compounding, but that some are made by compounding *and* abstracting. In fact, we have already arrived at that result. The making of an abstract or general idea involves both compounding and abstracting because the raw materials of abstraction are complex ideas, and all complex ideas are made by the mind compounding simple ideas. In the case of ideas of relations, the suggestion would be that Locke thinks of them as the joint products of comparing and compounding, or of comparing and abstracting, or perhaps all three.

Let us now take stock. We have considered a number of questions about Locke's accounts of three mental operations, confining ourselves to questions that can be discussed without first resolving the issue of what "*Ideas*" are. One problem concerned the scope of compounding. Locke claims that it is only simple ideas that we passively received through sensation and reflection, and this implies that compounding is ubiquitous. When this is combined with his volitionism, we get the absurd result that we must be constantly willing the union of simple ideas to make the complex ideas we have of the ordinary physical objects around us. An attempt to avoid this by showing how a good deal of this compounding might fall short of full-fledged mental action proved abortive. This is a serious problem for the view that Locke actually stakes out, but it is not one whose roots run very deep into his philosophy. He could easily say that we passively receive complex ideas through sensation, and he could do so without having to change much else about his theory of ideas. The problems with Locke's accounts of abstraction and comparing are far more worrisome. His account of abstraction – according to which that operation involves the mental isolation of parts of complex ideas – cannot do the explanatory work he requires of it. This is because he holds that complex ideas must be ultimately composed wholly out of simple ideas that we receive through sensation and introspection. That means that the extension of a general idea must be a kind defined by a cluster of shared observable or introspectible qualities. Yet many of the general ideas that we have cannot be delineated in that way. Locke needs a different account of abstraction, and giving one might require other large scale changes to his theory of ideas. Such changes might also be necessary if he is to give a more satisfactory account of the composition and acquisition of ideas of relations. The account he does give raises more questions than it answers.

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<sup>1</sup> See Stuart 1999, 2003, and Unpublished (a).

<sup>2</sup> This reading is defended by Ayers (1986, 1991) and Jolley (1999).

<sup>3</sup> Yolton sometimes seems to favor this reading (e.g., Yolton 1984). For a discussion of Yolton's vacillation about this, see Chappell (1994, 31-34).

<sup>4</sup> This reading is defended by Alexander (1985) and by Lennon (2001, 2004); it is ably criticized by Chappell (2004).

<sup>5</sup> The suggestion is explored, if not exactly endorsed, by Mackie (1976) and by Chappell (1994).

<sup>6</sup> Aaron (1937) and Woolhouse (1971) draw that conclusion. Bennett (2001, vol.2, p.13) describes the thesis that Locke's "ideas" are sometimes images and sometimes concepts as "mainly correct", but also says that "we cannot get far with the *Essay* on the assumption that its 'ideas' are not all images" (15).

<sup>7</sup> I explore the foundational questions about Locke's theory of ideas in my Unpublished (b).

<sup>8</sup> Aaron also cites this passage as showing that sometimes in the *Essay* "complex ideas, as well as simple, are held to be *given*" (Aaron 1971, 112).

<sup>9</sup> See, for example, II.xxiii.7 and III.vi.12-13.

<sup>10</sup> Why "for the most part"? Perhaps because Locke recognizes that our mental activities can help to determine which simple ideas we passively receive. By moving one's body in certain ways one may influence which simple ideas one gets: the child who puts the pineapple to his mouth then passively acquires a simple idea that the less adventurous child does not get. See III.iv.11, where Locke suggests that one can only acquire "the true *Idea* of the Relish of that celebrated delicious Fruit" by tasting a pineapple.

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<sup>11</sup> Note Locke's puzzling reference to the images in the mirror as "*Ideas*". He also speaks this way at II.i.15. In these two places, Locke is using 'idea' in a now obsolete sense meaning a figure, form, image or likeness of something. This is sense IIa for the noun 'idea' in the *Oxford English Dictionary*, which documents its use from 1531 to 1714.

<sup>12</sup> This is not to deny that Locke occasionally speaks metaphorically of ideas entering the mind via the sense organs. See II.ii.1; II.ix.14; III.iv.10,16.

<sup>13</sup> For Locke's volitionism, see II.xxi.5-8, 15.

<sup>14</sup> Jolley makes this point (Jolley 1995, 48).

<sup>15</sup> David Soles accepts Chappell's account of Lockean abstraction (Soles 1999, 46). Jolley seems inclined to do so as well (Jolley 1999, 50-51).

<sup>16</sup> Bennett points out this problem (Bennett 2001, 2: 26).

<sup>17</sup> For a more in depth argument against reading Locke as a subjectivist about colour, see Stuart 2003.

<sup>18</sup> It is not the feature that you are thinking of: male hummingbirds – like most avian males – do not possess an "intromittent organ".

<sup>19</sup> Perhaps it is because he says so little that commentators have come to such different conclusions about his conception of the status of relations. Gibson sees him as denying that relations have mind independent reality (Gibson 1917, 193-195). Bennett sees him as holding that relations are reducible in a certain sense (Bennett 1971, 253-254), and Langton sees him as holding that relations are real but irreducible in one of two senses (Langton 2000).

<sup>20</sup> If Locke thinks that the idea "sweeter" is a complex idea that "terminates in" the idea "sweetness" without containing it as a part, then his views about the composition of ideas of

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relation are even more mysterious. The suggestion that he came to have second thoughts about ideas of relations having parts at all is one I take up below.

<sup>21</sup> For example, see II.viii.10; II.xxxi.12; IV.ii.11.

<sup>22</sup> The suggestion is made by Gibson (1917, 65), Aaron (1971, 113), Woolhouse (1971, 33) and Jolley (1999, 45).