ABSTRACT. What ultimately exists for Locke is the solid. Reading this ontology in light of the atomist tradition elucidates and relates a number of important issues in the Essay: the analysis of space and related concepts, the distinction between simple and complex ideas, the distinction between primary and secondary qualities, the analysis of power and causation.

Locke's Essay[1] is a book about knowledge which foreswears ontological questions. Yet it would be surprising if the author of such a text held no ontological views, or if those views did not frequently intrude upon the work in important ways. I believe that roughly speaking Locke's ontology is an anti-Cartesian one of atoms and the void, designed to avoid what he regards as the pernicious results of the Cartesian version of the New Science.

Locke's chapter on the simple modes of space (2.13), for example, is for the greater part devoted to an extended critique of the Cartesian view. It is clear that Locke is here interested less in the question of the nature of space than in the Cartesian plenum theory, according to which there can be no space unoccupied by body because space or extension and body are identical. The problem with this theory from a Lockeian position is that it is inconsistent with empiricism on two related counts. Descartes holds that (1) geometry is a priori, (2) the object of geometry is space or extension, (3) for geometry to be true its object must exist, (4) extension and body are identical, and thus (5) geometry gives us a priori knowledge about existence of body.
For Locke, of course, all a priori knowledge is only hypothetical and existence claims about body must be based ultimately on sensation alone. A second aspect of the problem is that for Descartes not all contents of knowledge would be derivable only from experience; strictly speaking, in fact, none are empirically derivable. In the case at hand of a priori geometry of space, the contents of knowledge are available a priori as an innate idea. For an intuitive image of the contrast here, consider the Cartesian as endowed with an intellectual intuition of what is known, a clear and distinct vision of a non-empirical ideal object. For Locke, however, the appropriate metaphor is not intellectual seeing but physical touching. We must experience the world to determine its shape, so to speak, by feeling about to determine where there is solidity and therefore body, and where not. Intellectually blind in Cartesian terms, we must feel out of sight for the ends of being, if not ideal grace.

An atomist reading of Locke is not new. It was proposed by Leibniz, for example, who in the New Essays saw Locke as continuing Gassendi's struggle against Descartes on behalf of Democritean atomism. I believe, however, that an articulated atomist interpretation brings to grief a number of the central features of what has come to be the standard view of Locke. It will help in following my interpretation if we first set out some of the central features of the prevailing view that it would falsify. (a.) Substance. Ordinary objects are substances, with the result, among others, that they are mind-independent. (On my interpretation, ordinary objects are indeed substances, but as such they are phenomenal. Substances are ideas. Locke is, if you like, a Kantian—we perceive the world in terms of substance—but a Kantian without a transcendental deduction—we perceive as we do because of our psychology. In any case, the noumenal world does not contain substances, consisting only of solidity.) (b.) Primary Qualities. Primary qualities are occurrent properties. (On my interpretation only solidity is occurrent; all the other primary qualities are dispositions or powers resulting from the spatial distribution of solidity.) (c.) Secondary Qualities. There is no standard view of Lockean secondary qualities, but each of the following must be rejected: (i) the view of a string of commentators beginning with Berkeley that Lockean secondary qualities are ideas; (ii) Mackie's view that Locke's treatment of secondary qualities renders his account of qualities inconsistent; (iii) Alexander's view that secondary qualities are textures of the microscopic parts of things. My view will regard secondary qualities as powers. (d.) Space. As for Newton, space for Locke is absolute and real. (Though many commentators realize that the Essay waffles on this, few realize that Locke's Journals clearly reject absolute space, and no one has shown why he should be so disposed. Here the motor force is not Locke's atomism but its attendant nominalism.) (e.) Mind. Locke is a dualist. (I'll not argue so here,
but what is true of objects with respect to substance is true of minds as well. They are only perceived as substances. And the perceptions that are said to be had by minds are epiphenomena of a purely material world. Thus Locke subscribes to the materialism typical of the atomist tradition on which he draws. The result is that this paper on Locke's atomism is really about the whole of his ontology.)

The rectification of the standard view of Locke is only incidental to my purpose. It falls out indirectly from what I say. So perhaps it will help if I sketch the topics I shall discuss directly. In the first section of the paper I shall try to show that while Locke agrees with the Cartesian view of space being relational, there are important differences between their views, and in addition that for Locke what stands in spatial relations is solidity only. The second section discusses Locke's simple-complex idea distinction in an effort to show how the mechanism of this distinction allows it to be that there is only solidity in the mind-independent world. An obvious objection can be raised to this claim that for Locke there is only solidity in the real world; for according to Locke there are ideas other than that of solidity, e.g., shape, which resemble that world. Thus the real world would have, in addition to solidity, shape. The third section attempts to meet this objection and at the same time say something new about the time-worn topic of the primary-secondary quality distinction. This will lead to problems about powers, which will be addressed in the fourth section. Finally the last section ties together a number of issues related to solidity in an effort to provide a proof-of-the-pudding argument for the special status of solidity.

I. SPACE AND SOLIDITY

The Essay is at least superficially undecided about the nature of space, apparently leaving open the possibilities of either the relational or absolutist view. This is likely so because Locke's primary concern is with the plenum version of absolute space, although there are texts that suggest that any version of absolute space is unacceptable. In any case, the Journals Locke kept during his trips to France in the 1670's clearly argue the relational view. There is a crucial difference, however, between Locke's relational view of space and the Cartesian view, which is also relational. For Descartes, space though relational is yet at least quasi-substantival: space or extension (body in general) is independent of the individual bodies perceived to be in space. For Locke, space is relational in that apart from the bodies said to be in space, space is literally nothing at all. In this Locke departs from Gassendi, who was the primary source for his views on space. Gassendi had held that space is neither substance nor accident, but in the phrase of Seneca, a being suo modo. This turns out to be
the absolute space that Newton took directly from Gassendi. Locke instead follows the nominalist lead of the neo-Gassendiist François Bernier, for whom space without individual bodies would be an abstract entity and thus impossible. In the Journal entry for 27 March 1676 Locke argued that without its relata there is no relation of distance, "relation being nothing but the result of things in being as they are considered or compared together". On 16 September he continued, "For were there noe beings at all we might truly say there were noe distance." In the entry for 20 January 1678 Locke argued that for the world to be a foot distant to something beyond it, there must be something real to which it stands in this relation: "it is evident there is always required some real existence to be the other term of the relation."

Of what he calls abstract space Locke said on 24 January 1678:

Space in its confused and generall sense signifies nothing but the existibility of body, when we have a more distinct and precise notion of it and make it the same with distance supposesthe them actually to exist for if we say there is soe much space or distance to make the sentence clear and significative we adde between such a thing and such a thing, for one cannot say or conceive that there is any such thing as space or distance between something and nothing or which is yet more absurd too noethings.

Previously, on 16 September 1677, he said "space in its self seems to be nothing but a capacity or possibility for extended beings or bodys to be or exist, which we are apt to conceive infinite." Later in the same year he claimed that "Space is just noe thing, and signifies noe more but a bare possibility that body may exist where now there is none." The unoccupied place in which body might exist seems definable in terms of spatial relations among non-material points independently of bodies, because even if there were no bodies and thus no material points we could still talk of space in this sense. The non-material points must be possibilities of body. Thus we have two senses of space, both relational. Abstract space is the set of relations among these points where body may exist; and concrete space is the set of relations among actual bodies. The result is that Locke's plumping for the void means that the possibility of some spatial relations fails to be realized because the possibility for some instances of body fails to be realized. To say that one thing is at foot from another is not to say that there is anything a foot wide between them; it is only to say that there could be a body a foot wide between them without altering their relation of distance. And to know which relations are realized and which not, the only recourse is to experience.
What of the things that are said to be in space? As a first approximation we can say that for Locke what is in space is solid and only solid. "[Solidity,] of all other, seems the Idea most intimately connected with, and essential to Body, so as no where else to be found or imagin'd, but only in matter." (2.4.1.123) In his treatment of it, Solidity seems for Locke to constitute the principle attribute or essence of matter in the Cartesian sense—on it all its other properties depend. Insofar as a body is solid it fills space (2.4.2); using the language of the container view of space Locke here presumably attributes even the geometrical properties of body to solidity. Its filling space means two things: metaphysically, it excludes others from the space it fills, and thus solidity seems to be the principle of individuation, of which I shall say more later; and physically, it resists bodies that would fill its space, that is, it grounds the fundamental dynamical property of bodies.(2.4.2) In addition, the "Mutual Impulse, Resistance, and Protrusion" of bodies depend on solidity (2.4.5.V. also 2.13.11). Most importantly and most contrary to the Cartesians, space and solidity differ. "By this Idea of solidity, is the Extension of Body distinguished from the Extension of Space. The Extension of Body being nothing, but the cohesion or continuity of solid, separable, moveable Parts; and the extension of Space, the continuity of unsolid, inseparable, and immovable Parts." (2.3.5; 126) In thus viewing solidity as fundamental to matter, Locke again follows the Gassendist lead. Consider Bernier:

... having three or four things in matter, solidity, hardness, resistance, impenetrability and extension, which at bottom are a single and unique thing conceived differently, solidity must be considered as what is primary in matter and as the primitive and original cause of extension... The reason for this is that we conceive that what makes two parts of matter keep their extension or remain outside each other without them reducing one to the other and merging in a single and same place is that they mutually resist each other, and they resist each other because they are hard and solid. From which it must be inferred that rather than extension as the essence of matter, we must establish solidity, which is primary, or if you wish, impenetrability, which follows from solidity, although necessarily.[8]

Notice that Bernier adumbrates even Locke's distinction between solidity, which "carries something more of positive in it" and impenetrability, "which is negative, and is, perhaps, more a consequence of Solidity, than Solidity itself."[2.4.1; 123] Notice too the suggestion that solidity is not just the property on which all the other properties of a thing depend, but the only property of a thing, that
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its other properties are but solidity conceived differently. That is, a thing is said to have properties beyond its solidity only in so far as its solidity is conceived in different ways. To show how for Locke the appearances can be saved by solidity alone, something must first be said of his distinction between simple and complex ideas.

II. SIMPLE AND COMPLEX IDEAS

Locke's attempt to distinguish simple and complex ideas on phenomenological grounds is generally regarded as not very helpful. To say of a simple idea that it is "in it self uncompounded, and contains in it nothing but one uniform Appearance, or Conception in the Mind" [2.2.1; 119] is to say both too much and too little. The idea of a curve may be uniform but is nonetheless complex, and to call an idea uncompounded is only to call it simple. More promising is the characterisation of simple ideas as those in whose perception the mind is entirely passive, and of complex ideas as those resulting from the mind's activity. Thus, never having encountered a pineapple before I cannot have an idea of its taste, but having seen things of the same color and shape, I can combine these and imagine what it looks like. What exactly is this activity and what does it yield?

At 2.12.3 Locke divides complex ideas into modes, substances, and relations. (Note for later that he does not say ideas of modes, substances and relations.) In the fourth edition, however, he adds to 2.12.1 a division according to the mind's acts "wherein it exerts its power over its simple Ideas"; the first of these is its power of combining ideas, and from this, he says, result all complex ideas. This poses a terminological problem since relations and general ideas result from two further kinds of act, viz. comparing and separating. The problem, at a minimum, is that relations are classed both as complex and non-complex and further, that it is unclear how general ideas stand to substance and mode.

The terminological instability may be an indication of two models of mental activity. 1) On the production model a new idea is produced from the materials of simple ideas; thus, "though . . . made up of several simple ones put together," "complex ideas may be considered each by itself, as one entire thing, and signified by one name." [2.12.1; 164] There might be various versions of this model. (a) One would be the creation version, a theory Malebranche criticizes as requiring a power no less than that of creation ex nihilo. "It is no more difficult to create an angel than to produce it from a stone", and no less difficult to produce an idea from an impression than to create it from nothing.[9] But this is not Locke's position, for it seems precluded by what he says about the production of simple ideas. As in the material world our power is restricted to
the rearrangement of particles and never extends to the cre­
ation or annihilation of them, so in the mental we cannot create or annihilate simple ideas but only as it were, rear­range them.[2.2.2; 120. Also. 2.26.1-2; 324-5 and infral] (b) Another version of the production model might be called the essentialist version, whose main idea would be the Ar­istotelian contention that a house, for example, is more than the sum of its parts. Again we have a view which cannot have been held by Locke, for whom the essence of a thing consists only in its microscopic parts. There are emergent properties for Locke, but these as we shall see, relate only to the production of simple ideas of secondary qualities. (c) A final version might be called the combinatorial; here complex ideas are just sets of simple ideas. As an ontolog­ical account of complex ideas, this version is not incom­patible with the second model of mental activity: (2) the perception model, according to which complex ideas are merely results of viewing simple ideas in a certain way, with no real change in the simple ideas. For an intuitive idea of the model, consider figure-ground shifts; to see now as a rabbit what we just saw as a duck requires no change in what we see. On this model the world's complexity is a function of our perception of it, which is as it should be, given atomism. Substances, that is perceived things such as calendars and harmonicas, are, like relations and univer­sals, mind-dependent, though through "inadvertancy" we may regard this complexity as a simple idea, i.e., as given. [2.23.1; 295] Now a full explication of this model would have to show how in fact all perception for Locke is pas­sive—after all, complexity cannot be matter of volition, for it is not up to me to see the calendar to the left of the harmonica, or to see them as substances. This is a long story involving the role of judgment in perception, what Malebranche called natural judgments and Hume natural be­liefs, the historical denouement of which is associationist psychology. But I do think that this is the model Locke has in mind when he says that we get relations by "bringing two Ideas . . . together; and setting them by one another, so as to take a view of them at once, without uniting them into one"; [2.12.1; 163]; whereas substances are got by viewing ideas so as to unite them, and modes by viewing them so as to separate them. On this model Locke, far from being slop­py, in fact is as precise as he can be when he later says that the nature of relation consists in the referring or comparing of two things [2.25.5; 321], for relations are acts of awareness, not occurrent real properties of things, or when he says that a substance is a bundle of ideas (plus a substrate), rather than a bundle of qualities, for sub­stances (apart from the substrate) must on this view be per­ceived.

Now what does this all mean for solidity, and more es­pecially, for space?

If space is a mode, or more precisely, the relational
set of simple modes that it is for Locke, then spatial characteristics are mind-dependent. A thing's perceived shape will be a function of our perception of it. This is not merely a matter of perspective, though problems of perspective are resolved by this thesis: as there is no perceived color which is the real color of a pigeon's neck, so there is no perceived shape which is the real shape of a penny, both varying with perceptual conditions. The same conclusion is reached by another argument. At 2.4.5 Locke distinguishes in Gassendist fashion between the extension of body and the extension of space. "The Extension of the Body being nothing, but the cohesion or continuity of solid, separable, moveable Parts; and the Extension of Space, the continuity of unsolid, inseparable, and immovable Parts." Since atomic particles are by definition inseparable, i.e., indivisible, they are without extension, and thus without shape.[10]

A similar result is reached at 2.13.22, where Locke attacks the Cartesian plenum with an argument for which Gassendi may have been the vehicle from antiquity. The argument is interesting in its own right. Dividing a body so as to make possible the rearrangement of its parts without altering the supericies of the body, Locke argues, requires a void at least as large as the least part of the body even if it be no larger than the one-hundred-millionth part of mustard seed. The situation is illustrated by the Rubik cube of yesteryear--the two-dimensional rearrangement of square tablets numbered one to fifteen which requires an unoccupied sixteenth square.[11] (Thus, because atoms are solid they are inseparable, and because inseparable, without extension.) This is a slightly different argument from that advanced by the ancient atomists. Simplicius tells us that "Leucippus, Democritus, and Epicurus supposed [the first principle] to be uncuttable and indivisible and impassive because of their solidity, and without any share of the void. For division, they maintain, takes place because of the void which is in bodies."[12] The argument is that a knife can cut through bread only if it encounters void space and that it will do so only to the point at which it meets the uncuttables, viz. the atoms, which are solid, or as Leucippus put it, "well-kneaded", i.e., "without air spaces". Now this argument, which unlike Locke's does not insist on unaltered supericies, may be rebutted by allowing parts of alleged atoms simply to be moved aside. Division may require motion in the divided, and motion may require the void, but that void may be outside of bodies. The Cartesian could use a version of this rebuttal in response to Locke's argument: for a body to move, space void only of it is required; thus motion is possible if bodies simultaneously displace and are displaced by others, thus in a circle or three-dimensionally in a vortex. But this solution must be rejected by Locke because it entails that, contrary to the atomist hypothesis, matter is infinitely divisible, which Locke regards as near-contradictory. [2.23.31; 313] For
Descartes a body is as much of matter as moves together; and motion is relative to surrounding bodies. Thus motion occurs when the relation of the parts of a body to those around them change. But there will be parts of a body only if they have their own motion, which they do not have since the body moves as a whole. To avoid the conclusion, first suggested by Newton and recently drawn by Kenny, that if Descartes's view is correct no motion is possible, we must suppose motions on motions carousel-style to infinity, and thus the infinite divisibility of matter. Some other account, then, must be found for the cohesion of Locke's extensionless atoms.

The problem of coherence of bodies is one which is very prominent in the period. It lies, for example, at the heart of Malebranche's revision of Descartes's rules for the communication of motion and his debates with Leibniz on the topic over a thirty-five-year period. Locke does not know what to make of coherence finding it as inexplicable as thinking in the soul. "Since Body is no farther, nor otherwise extended than by the union and cohesion of its solid parts, we shall very ill comprehend the extension of Body, without understanding wherein consists the union and cohesion of its parts; which seems to me as incomprehensible, as the manner of Thinking, and how it is performed." [2.23.24; 309 and also 4.3.29; 556-60 and 2.23.28; 311] The inexplicable coherence is not that of bodies composed of atoms. The result of this attachment of parts is hardness, which can be explained in mechanistic terms. Instead, what Locke finds incomprehensible is the internal, necessary coherence of the parts of atoms, which along with the production of sensation and the rules for communication of motion, he elsewhere attributes to the "Arbitrary Will and good Pleasure of the Wise Architect." (4.3.29; 560) In my view, what he cannot explain is the fact, or as he puts it, the creation, of material existence, which just is the indivisibility of solidity.

III. PRIMARY AND SECONDARY QUALITIES

It might be thought that an objection to the above might be drawn from Locke's representationalist theory of perception, which distinguishes between ideas of primary and secondary qualities on the basis of their resemblance or failure to resemble those qualities. Although they have a representative function, ideas of secondary qualities do not resemble those qualities; but among ideas of primary qualities, which do resemble those qualities, we find in addition to the idea of solidity, the ideas of extension, figure, motion or rest, and number. It would seem to follow that in addition to being solid, what is external to the mind really is extended, figured, etc., i.e., that it is such independently of its being perceived as such. So far is this theory from being an objection of my account of solidity, how-
ever, that I am prepared to make it the main post and pillar of the account. To show this the objection must be developed in some further detail.

Recall that for Locke an idea is the object of awareness, the id quod intelligitur in the Scholastics' phrase. "Whatsoever the Mind perceives in itself, or is the immediate object of Perception, Thought, or Understanding, that I call Idea." [2.8.8; 134] Or again, "Every Man being conscious to himself, That he thinks, and that which his Mind is employ'd about whilst thinking, being the Ideas, that are there, 'tis past doubt, that men have in their Minds several Ideas, ; . . ." [2.1.1; 104] These ideas are needed because of the problem of action at a distance; objects which are not spatially present to the mind cannot act on it in the way necessary to be perceived. "... Bodies produce Ideas in us . . . by impulse . . . If then external Objects be not united to our Minds, when they produce Ideas in it; . . . 'tis evident, that some motion must be thence continued by our Nerves, or animal Spirits, by some parts of our Bodies, to the Brains or the seat of Sensation, there to produce in our Minds the particular Ideas we have of them." [2.8.12; 136] Or, in an even clearer passage, "... since the Things, the mind contemplates, are none of them, besides itself, present to the Understanding, 'tis necessary that something else, as a Sign or Representation of the thing it considers, should be present to it: And these are Ideas." [4.21.4; 720-21] In addition, these epistemological proxies are said to be pictures or images of the things whose place they take. So much is clear from Locke's use of the camera obscura model of the mind. "... external and internal Sensation, are the only passages that I can find, of Knowledge, to the Understanding. These alone, as far as I can discover, are the Windows by which light is let into this dark room. For, methinks, the Understanding is not much unlike a Closet wholly shut from the light, with only some little openings left, to let in external visible resemblances, or Ideas of things without; would the Pictures coming into such a dark Room but stay there, and lie so orderly as to be found upon occasion, it would very much resemble the Understanding of a Man, in reference to all Objects of sight, and the Ideas of them." [2.12.17; 162-63] The objection may now be stated more clearly. The images depicted on the mind's screen, as it were, appear to be both colored and shaped; but on the corpuscular hypothesis we can explain this appearance by assuming that the object causing the image is shaped, both at the macro--and micro--levels, but not in any other sense colored. The result is that mental images only partially resemble what they represent, but they do so in a way which extends beyond solidity to shape and other such qualities.

The linchpin of the objection is its notion of resemblance, which fairly begs to be explicated. I shall begin with two attempts to do so, which, though unsuccessful in my
view, nonetheless have something to contribute to our own story.

It might be thought, first of all, that the resemblance between an idea and its object is the literal isomorphism of moderate realism, according to which two things which are qualitatively identical share a third thing, the quality which in this sense is universal. In the language of the best-known proponents of this view, qualitatively identical things share the same form. John Yolton in a number of publications has mobilized this account of resemblance to argue that Locke's is not a representationalist theory requiring ideas as objects, but that instead ideas for him are the id quo intelligitur, the structures by means of which we are aware of the objects of ideas. Thus Yolton views Locke as holding the Cartesian theory of ideas whose distinction between objective and formal existence is derived from the Scholastic between the virtual and real exemplification of the same form. Very roughly, the view is that the mind is aware of an object by conforming to it in a certain way, and this is possible insofar as the same thing can exist both as the object and as the act of awareness. On this view it is analytic that an idea and its object resemble for they are the same thing. An idea does not represent its object by standing for it in the mind but by presenting it to the mind. As Arnauld put it, the idea is the thing itself insofar as it is in the mind.

I believe the case against Yolton's reading of Locke in this non-representationalist way is massive. The part of it relevant for present purposes is that Locke himself rejects the view, and for reasons lying at the core of his thinking. The Aristotelian John Sergeant in Solid Philosophy (1697) set down the view that intentional awareness requires what he called meanings, which but for the terminology, are indistinguishable from Cartesian ideas. The crucial agreement between Sergeant's and the Cartesian view is that what is in the mind and what is external to it as its object are numerically identical. "The same Ens or Thing may have diverse Manners of Existing: one Corporeal, the other Intellectual or Spiritual." In his marginal notes to Solid Philosophy Locke objects to Sergeant's view "that a (perfectly) like is the same."[13] As Locke announces at the outset of the Essay's chapter, Of General Terms, "All Things, that exist, being Particulars", [3.3.1; 409] the only sameness for him can be the sameness or identity of an individual. Thus he must reject the qualitative identity of individuals, e.g., of the mind and its object, or the numerical identity of their qualities. A fortiori must he reject the view that a thing can exist in two different ways, as the awareness or its structure and as the object of that awareness, and in fact he claims in the marginal notes not to understand what it is for "a material thing to exist spiritually". The important point here is not just that an interpretation of Lockean ideas is wrong but that an interpretation of the
connection between them and their objects is wrong. Just as the direct realist account is wrong because there are no shared forms, so the representationalist account of resemblance in terms of literal isomorphism is wrong because of the same nominalism. Thus it cannot be argued that because some ideas are immaterially shaped and also resemble with respect to shape, things have, in addition to solidity, real shape. The representationalism stands, and it remains true that ideas of primary qualities resemble, but some other account of that resemblance must be found.

A different account of the resemblance between ideas and qualities comes from Peter Alexander, whose thesis is that resemblance here is a matter of accuracy. An accurate idea of a ruler need not resemble it by being a foot long. Instead, what we might call the semantic content, what the idea is of, must allow a true description of the object. "Now primary qualities are such that the words we use in describing our ideas of them are also the appropriate words for describing the qualities; secondary qualities are such that the words we use in describing our ideas of them will not do for describing the qualities. The description of an idea of a primary quality is of the form 'of an x' and the description of the object having the quality is 'has x' or 'is x'; the resemblance is in the description."[15]

This imaginative account won't do for a number of reasons. One is Locke's repeated reference to ideas as objects, as images or pictures of what they represent. A more important reason is that what is true of primary qualities according to Alexander seems true of secondary as well. Locke in his discussion of the Molyneux Problem points to the role of judgment and interpretation as built into or as building in certain features of experience. Through experience we come to regard an appearance as the appearance of a thing having certain qualities. In the case of the shaded alabaster globe, says Locke, "from that, which truly is variety of shadow or colour, collecting the Figure, judgement makes it pass for a mark of Figure, and frames it self the perception of a convex Figure, and an uniform Colour; when the Idea we receive from thence, is only a Plain variously color'd, as is evident in Painting." [2.9.8; 145] The thesis is that we experience an object as having three dimensions and a single color when in fact the datum reduced by an Husserlian epoche is two dimensional and shaded. Similarly with respect to the perception of primary qualities in perspective. As Alexander puts it, "for a visible thing to be given size just is, in part, for it to 'look smaller' at 50 feet than it does at 10 feet."[16] But by the same token, as Locke's own example suggests, for a thing to be green, just is for it to appear green in white light. Alexander is right that Locke does not argue this primary-secondary quality distinction, as so many are thought to have done, on the basis of the relativity of sense perception. From his reading of Malebranche, for example, Locke
could have been convinced as Berkeley was that ideas of both kinds of quality may vary. Yet Alexander fails to see that his observation cuts both ways. Just as primary qualities are not distinguished as invariant, so secondary are not distinguished as variable. Alexander fails to see that his account of resemblance thus allows ideas of secondary qualities to resemble because for him "color words, for example, should be thought of as the names of ideas, not of qualities."[17] Shape-words and color-words refer to radically different sorts of things. But there is no need to pin such a strange view on Locke, according to which it is not the carrion that smells but my idea of it.[18] Still, to regard the picturing relation as non-primitive for Locke, and in a sense other than the literal isomorphism of moderate realism, is on the right track.

The three principal features of Lockean primary qualities are that they are real, they are inseparable and they resemble. My suggestion is that they amount to the same thing. Consider their inseparability. A grain of wheat divided until its parts become insensible "must retain still each of them all those qualities [of solidity, extension figure and mobility]", [2.8.9; 135] which in fact are "utterly inseparable" from it. Now one commentator after another has pointed out that what Locke says here is true of primary qualities only as determinables, but that in this sense it is true of secondary qualities also. The determinate qualities, both primary and secondary, may vary, but it must have some determinate for each determinable of both kinds, both kinds of which are thus inseparable. This is such an obvious point, it seems to me, that not even Berkeley's Locke could have missed it. To show that in fact he was not guilty of this oversight, let us take seriously in a way that few have "that Locke means by 'quality': "the Power to produce any idea in our mind, I call Quality of the Subject wherein that power is. Thus a Snow-ball having the power to produce in us the Ideas of White, Cold, and Round, the Powers to produce these Ideas in us, as they are in the Snow-ball, I call Qualités". [2.8.8; 134] What is going on here?

The term quality is used in this period, the latter half of the seventeenth century, in a way which invokes no theory beyond what is needed to distinguish subject and predicate. For example, the anti-Aristotelian Bernier nonetheless describes his own definition of quality as Aristotelian: "what makes a thing to be called such and so; ... anything that makes things to be denominated in a certain way" [denommées telles].[19] Locke goes beyond this common currency with his view that what makes us say of a thing that it is of a certain kind is that it causes us to have certain ideas. This specification of his term quality Locke takes not from the atomists, Gassendi, Boyle, Bernier, et al., but from the Cartesian Jacques Rohault. In his widely read and influential Traité de Physique we find the fol-
lowing: "by the word quality we shall hereafter mean what makes a thing to be denominated in a certain way; thus, whatever it might be in fire, that power it has of exciting in us the sensation of heat, insofar as that makes the power be called warm, we call a quality of fire."[20] In the Entretiens sur la philosophie Rohault adumbrates the lines along which Locke developed the notion: "We admit these qualities in objects only because we experience that they excite in us various sensations we do not have in their absence... [Thus] it is easy to see that we may define the sensible qualities of objects [as] the powers they have of exciting in us the sensations we experience them to excite. Thus the savour of wine is the power the wine has to make us taste as it does; likewise, the snow's whiteness is the power the snow has to make us see as it does."[21] Later he tells us about these powers: "the nature of all sense qualities, or of all those different powers that various bodies have to make us sense as they do, consists only in the various sizes, shapes and motions of the particles of which these bodies are composed".[22] Locke in a familiar passage says the same thing of secondary qualities, viz. that they "are nothing in the Objects themselves, but Powers to produce various Sensations in us by their Primary Qualities, i.e., by the Bulk, Figure, Texture, and Motion of their insensible parts..."[2.8.10; 135]

With qualities as powers to cause ideas, what is the sense in which primary qualities are inseparable? An easier question to answer concerns the sense in which secondary qualities are not inseparable. At 2.8.13, at which point primary and secondary qualities have been distinguished only on the basis of separability, Locke supposes that the ideas of secondary qualities might be caused "after the same manner" as ideas of primary qualities, viz. by the impulse of insensible particles. They might be so caused, "it being no more impossible to conceive, that God should annex such Ideas to such Motions, with which they have no similitude; than that he should annex the Idea of Pain to the motion of a piece of Steel dividing our Flesh, with which that Idea hath no resemblance." Secondary qualities, I suggest, do not resemble and are not inseparable in that they have no necessary connection with the ideas of them. The idea of pain could be annexed to the motion that in fact produced the idea of color. Later, in discussing the extent of knowledge in Book Four, Locke tells us that with our present powers or perception we just don't know the primary qualities of the insensible parts on which the secondary qualities depend. But in addition, "there is yet another and more incurable part of Ignorance, ... and that is, there is no discoverable connection between any secondary Quality, and those primary Qualities that it depends on."[4.3.121 545] We don't know (1) the texture, i.e., the configuration of the primary qualities of microscopic parts, (2) the connection between the texture and the secondary qualities, or even (3) how there could be a connection between them. "We
are so far from knowing what figure, size, or motion of parts produce a yellow Colour, a sweet Taste, or a sharp Sound, that we can be no means conceive how any size, figure, or motion of any Particles, can possible produce in us the Idea of any Colour, Taste, or Sound whatsoever; there is no conceivable connexion betwixt the one and the other." [4.3.13; 545 V. also, 4.3.28; 558-9 and 4.1.0; 541] The result is that a thing might under the same circumstances have different secondary qualities, and yet be the same thing. If I am right, this is the sense in which secondary qualities are separable and have no resemblance.

It might be noted en passant that secondary qualities are, not the primary qualities of particles, but the powers that result from these. They are "nothing, but powers". And in order to know what these powers are, we must experience the idea of secondary qualities. Thus, although secondary qualities are, as Locke repeatedly says they are, in the object, they are, as in the tradition, mind-dependent. Take away the mind's power to receive certain ideas, or alter those powers, and the secondary qualities of the thing are taken away or altered. This is the sense in which those qualities are only imputed. [2.8.22; 140]

Primary qualities on the other hand are real or original; they are independent of our perception of them. [2.8.23; 140] They are inseparable in the sense that because the connection between these powers and the ideas produced is necessary, the thing must always have this power. With microscopic eyes, for example, our ideas of secondary qualities might be unpredictably different or cease altogether; but such is not the case with primary qualities. The upshot is that ideas of primary qualities give us information about the world in a way that secondary qualities do not. In a moment we shall see that ideas of all the primary qualities except the idea of solidity are relational. Thus complex, these ideas must, as we have seen, be a function of our perception of them. But the way we perceive them will be fully constrained by the corpuscularian hypothesis, which will specify a thing to have certain powers.

The rest of this story is a long one, but most of it is epistemological. For example, with what we have in hand sense can be made of Hume's otherwise perplexing classification of resemblance among those philosophical relations that yield knowledge. His other relations in this category, contrariety, degrees in quality, and proportion in quantity or number, are unproblematic; but how for a nominalist resemblance can be "discoverable at first sight, and fall more properly under the province of intuition than demonstration",[23] how it can "depend entirely on the ideas, which we compare together",[24] is more than I can make out except along the lines above. That is, if Hume takes over something like Locke's account, then we have an explanation of why resemblance is a necessary feature of the world and thus
one that yields knowledge. The account works only for ideas of primary qualities, but maybe Hume did not mean resemblance between ideas of secondary qualities to be an object of knowledge. Leibniz too has some interesting things to say about the Lockean connection between qualities and ideas. In the New Essays he gives an account of the primary-secondary quality distinction, which in fact is very close to that advanced above as Locke's. He defines qualities for Locke as the "faculties [of things] for producing the perception of ideas in us,"[25] and then comments that the difference between primary and secondary qualities for him is that the former "power is intelligible and admits of being distinctly explained . . . [The latter] is merely sensible and yields only a confused idea."[26] But for Leibniz there is a resemblance or exact relation, and not just the accidental one he sees Locke admitting, between ideas of secondary qualities and those qualities. The connection is like the "expressive" relation between a parabola and the circle of which it is the projection on a plane.[27] To Locke's argument about the pin and the pain it causes, for example, he responds that "pain does not resemble the movement of a pin: but it might thoroughly resemble the motions which the pin causes in our body, and represent them in the soul, as I have not the least doubt it does."[28] The difference between Locke and Leibniz on this point is crucial for their epistemologies. Locke has the weakly necessary connection between ideas of primary qualities and those qualities—weak because contingent on the corpuscular hypothesis—and only an accidental connection between ideas of secondary qualities and those qualities. But Leibniz has a strongly necessary connection between all ideas and what they represent, strong because the connection is the literal isomorphism of moderate realism; my perception may be confused as it is in the case of color but what I perceive is the same form that is in the object. Thus we find in Locke the skepticism, even with respect to primary qualities, that is so alien to Leibniz. Locke never goes beyond referring to corpuscularianism as anymore than a hypothesis.

To take stock: we have met one kind of objection only to raise another. While Locke's representative theory of perception does not entail that the world has occurrent properties beyond solidity it does seem to entail that it has dispositional properties beyond solidity. Purged of extension, the world now seems infested with powers.

IV. POWERS

Locke sometimes says that qualities produce effects, [2.1.1; 119 and 2.23.2; 295] at other times that powers produce effects, or that things do in virtue of powers.[2.8.24; 141] I propose the following stipulations, on which of course I shall have to make good. Let us say that a power is that the possession of which enables a thing to
be a cause (or in the case of passive powers, an effect). To say that \( x \) possesses \( P \) in this sense is to say that \( P \) is true of \( x \), and to say that \( x \) is enabled to be a cause is to say that \( x \) is defined as a cause under certain conditions. The definitions by which power predicates may be eliminated (or introduced) is of the kind that Carnap called condition- al, viz. a logical bilateral reduction sentence. On this account, if a thing is viewed under certain conditions, then it has, for example, the secondary quality green, i.e., the power to cause the idea of green just in case that idea is perceived. Besides reducing the power predicate such an account both emphasizes the lack of additional factual content in the statement introducing them, which is very much in keeping with the anti-Aristotelianism of the corpuscular hypothesis, and also suggests the relational character Locke see inherent in powers.

What is it the possession of which enables a thing to be a cause? On my thesis it is solidity and solidity alone.

I confess Power includes in it some kind of relation, . . . as indeed which of our Ideas, of what kind soever, when attentively considered, does not? For our Ideas of Extension, Duration, and Number, do they not all contain in them a secret relation of the parts? Figure and motion have something relative in them much more visibly: And sensible Qualities, as Colours and Smells, etc. What are they but the Powers of different Bodies, in relation to our perception, etc. And if considered in the things themselves, do they not depend on the Bulk, Figure, Texture, and Motion of the Parts? All which include some kind of relation in them. Our Idea therefore of Power, I think, may well have a place amongst other simple Ideas, and be considered as one of them, being one of those, that make a principle Ingredient in our complex Ideas of Substances, . . .[2.21.3; 234]

It should be noted first of all that while Locke here calls the idea of power a simple idea, thus indicating perhaps that power is non-relational and primitive in a way contrary to my thesis, he later clarifies this as true only relative to the substances they for the most part constitute: "I have reckoned these Powers amongst the simple Ideas, which make the complex ones of the sorts of Substances; though these Powers, considered in themselves, are truly complex Ideas."[2.23.7; 299] The powers of Gold, for example, "are nothing else, but so many relations to other Substances; and are not really in the Gold, considered barely in itself, though they depend on those real, and primary Qualities of its internal constitution whereby it has a fitness, differently to operate, and be operated on by several other Sub- stances."[2.24.37; 317]
But the main point is that among the exhaustive list of ideas said to contain some relation is not to be found solidity. It would seem that solidity is that on which power and all other relations, in fact, all other complex ideas, depend.

This thesis runs counter to the view advanced by P.M. Heinman and J.E. McGuire in a pair of papers dealing with forces and powers, inter alia, in the eighteenth century. They point out that the general seventeenth-century conception of Descartes, Hobbes and Boyle, for example, "viewed powers as being non-inherent in matter; that is, 'powers' are not ascribable to bodies in and of themselves. Rather, powers are manifested only when bodies are in specifiable relations with one another; i.e., the sun has the power actively to melt wax [only] if wax is present, and the wax to melt only when heat is present."[29] In the eighteenth-century, however, we find a non-reductivist, non-relational substantival view of power: "Contextually, what eighteenth-century thinkers generally mean when they use the term 'power' is this: to ascribe a power to a material object is to assert what it can or cannot do in virtue of its intrinsic nature in relation to specifiable extrinsic circumstances, leaving open a complete characterization of the object's constitution in virtue of which it is held to be endowed with powers."[31] These powers "were conceived as being substantively present in entities, thus defining the entities' essence in terms of inherent activity."[32] What is more, this use of the term power is thought likely to have arisen in part from Locke's Essay. "On the whole Locke tends to conceive powers in the relational sense, though passages such as those cited could be construed, and were by eighteenth-century thinkers, as supporting a substantive conception of powers."

Perhaps Locke was read in this way: but the texts in my view do not support the reading. Of the texts Heinman and McGuire cite, one group deals only with Locke's denial "that powers inherent in physical objects are active".[33] with the result that "strictly speaking, bodies are not ontologically causative in nature."[34] In fact, however, Locke's concern in these texts is with the source of the idea of power, not with the question whether bodies are active. The possibility remains, however, that once in possession of the idea from reflecting on the mind's operations, viz. volitions, we might then attribute powers to objects in the way Hutton, Priestly and others in the 18th century did.

The question then comes down to the other group of texts, which make up the discussion of ideas of primary and secondary qualities in ch. 8 of Bk.II. Here 'power' is employed contextually in an "active causal sense."[35] "Since secondary qualities are powers barely, and nothing but powers, relating to several other bodies, and resulting from the different modifications of the original qualities, Locke
not only designated secondary qualities as relational properties, but also tends to construe them as exemplifying an undefined notion of causation."[36]

To say of matter that it possesses the property of being red is the same as to say it is capable of producing under suitable conditions an idea of redness in our awareness. Thus, a chair does not have the color red as well as the power to produce the idea in the mind. To have a causal power is not the same as to have a property like red. With respect to primary qualities, however, Locke holds that they exist absolutely and categorically in the object and also have the 'power' to produce ideas of primary qualities which in the mind resemble those qualities themselves.[37]

The powers inherent in things are the primary qualities, or perhaps the powers resulting from these, for they appear to be different from qualities, and these powers are said to exist absolutely and categorically in the object. Presumably it is the inseparability of primary qualities that entails that they are substantival. But, as I tried to show, the inseparability of primary qualities does not entail that there is anything more than solidarity in things. To put it a different way, primary qualities are, no less then secondary qualities, dispositive, to use Boyle's term, so that what Heiman and McGuire say about secondary qualities on the basis of Boyle's example of the key's power to open can be said of Locke's primary qualities as well. "In considering the 'power' that a key has to open a door Boyle points out that there is nothing in the key over and above its shape and size and the fact that it fits a particular lock. This shows three things about Boyle's conception of power [and presumably about his notion of the way things in the absence of sensation are "dispositively" endowed with colors, tastes, etc.]: (1) that it is relational (2) that powers are not entities distinct from the primary qualities nor are they inherent properties in objects, and (3) that they are distinct from the effects objects have on one another by means of their inherent qualities."[38]

This is not to say that Locke is entirely unequivocal in speaking of powers, for he sometimes does have them dependent on other things and sometimes not. If all powers are relational then the explanation of his apparent equivocation is an oscillation between a relation considered as (1) the "occasion" for the would-be relation, and (2) the relating, which can obtain only if there exists the other relatum. Relations are acts of relating, thus mind-dependent, but not everything can be related in every way--to use his example, only he who has gone through a certain ceremony can be husband of Sempronina. Thus primary qualities are mainly regarded as relations in the first sense, i.e., as the objective occasion--they are had, and given the corpus-
cular hypothesis, must be had, independently of everything else, while secondary qualities are taken in the second sense; they are nothing but powers, dependent on the perceiver.

Thus Locke's equivocation or oscillation between relational and substantival powers seems more apparent than real. But there is a deeper ambiguity relating specifically to active powers, which may be reducible in another sense. Here Locke really does shift his position, perhaps insensitively to the shift because of other, overriding concerns.

Locke's chapter on power is an additional example of a topic treated only in relation to some other polemical purpose. Of its 73 paragraphs, 67 deal with the problem of freedom. It seems clear that his primary aim is less with the metaphysical issue we are discussing than with the moral problem of securing responsibility and freedom within a deterministic framework. The specter of Hobbes, or rather of the treatment accorded Hobbes and Spinoza as well, looms over the chapter. The result is that Locke's views on active power, or at least the language used to express them, are here and elsewhere less than precise.

Ruth Mattern has argued that Locke at various times held three different views on active powers.[39] His latest view can be had from the addendum to paragraph 73 published in the fourth edition, 1700, the last in Locke's lifetime. The relevant claim here is that "the Active Power of motion is in no substance which cannot begin motion in itself, or in another substance when at rest."[2.21.72; 286] At this stage Locke is distinguishing between causal powers, which can be had by bodies, and active powers which can be had only by spirits. "When I turn my Eyes another way, or remove my Body out of the Sun-beams, I am properly active; because of my choice, by a power within myself I put myself into that Motion. Such an Action is the product of Active Power."[2.21.72; 286] The next earliest view is to be found in the first, and subsequent editions of the Essay, and also in the 1685 Draft C. It is expressed by the familiar passage, among others, in which Locke tells us that communication of motion from one body to another "gives us but a very obscure Idea of an active Power of moving in Body, whilst we observe it only to transfer, but not produce any motion. For it is but a very obscure Idea of Power, which reaches not the Production of the Action, but the Continuation of the Passion. For so is motion in a body impelled by another."[2.21.3; 235] Mattern calls these degenerate powers in the sense that the idea we have of them is inadequate in Locke's sense of the term; they are poor examples of active powers, but examples nonetheless. Locke's earliest view is found in Draft C: "Power thus Considered is twofold, viz. as able to make or able to receive any change. The one might be called Active and the other passive Power."[40] "If we would consider them aright we should I suppose find
that one of them is soely [sic] in God and not at all in creatures and the other soely in the creatures but not at all in God. For I thinke it is a cleare truth that God alone has power to change all other things but is not capa­ble of any change in himself. And that all the creatures are capable of change but have not in themselves an active power to produce it."[41] On this view God alone has ac­tive powers; but Locke crossed out this passage—in Mat­tern's view not taking it very seriously because of its blan­tant proximity to occasionalism. He added a marginal note, which with the first passage above was to appear in all pub­lished editions of the Essay: "whether Matter be not wholly de­stitute of active Power, as its Author God is truly above all passive Power; and whether the intermediate state of created Spirits be not that alone, which is capable of both active and passive Power, may be worth considera­tion."[2.21.2; 234]

But suppose we consider carefully the next sentence: "I shall not now enter into that Enquiry, my present Busi­ness being not to search into the original of Power, but how we come by the idea of it." That is, the whole rest of the chapter is intended to deal with how we get the idea of power rather than with what has power and in what sense. Thus, even when Locke suggests that the mind might "receive its idea of active Power clearer from reflection on its own Operations, than it doth from any exteraa Sensa­tion",[2.21.4; 236] he need not be suggesting that the power whose idea derives from reflection is had by the mind. In­deed, the nicest Lockean view would be that active power belongs only to the Creator, as Draft C states, and that it is only experienced in us and, to an imperfect extent, in bodies. Since Locke foreswears the question, this is a dif­ficult exegetical position to defend. But it is textually at least plausible.[42]

Its best defense will be a proof-of-the-pudding argu­ment—the justification lies not with the recipe but with the result—in this case, an interesting reading of a number of related issues that will show that active power clearly is the power of creation.

V. MATTER AND CREATION

The chapter "Of Cause and Effect, and other Relations" (2.26) distinguishes two sorts of causes or "Originals of things". One is creation, "as when a new Particle of Matter doth begin to exist, in rerum natura, which had before no Being" [2.26.2; 325] The other sort of causation employs these already-existing particles and itself divides into three kinds. One, I think, involves the rearrangement of particles with a resulting organic unity; this Locke calls generation. Another kind occurs when the rearrangement of particles results only in a change of primary qualities;
this he calls making. Finally, when the rearrangement results in a change of secondary qualities, we have alteration. Solidity on this scheme seems able to be caused only in the first sense; it must be created, for it does not result from rearrangement of particles, which rather presupposes solidity.

The same conclusion is suggested by the following chapter, "Of Identity and Diversity". Here Locke distinguishes a number of senses of identity, the most basic of which is relative to the place and time of origin of the thing individuated. For both bodies and finite spirits an individual is just that thing whose history is traceable back to the place and time it began to be. But given the relational view of space and the dependence of relations on relata, place-time cannot individuate. This, of course, is not Locke's argument but Russell's. Still, place-time do not individuate for Locke. "From what has been said, 'tis easy to discover, what is so much enquired after, the principium Individuationis, and that 'tis plain is Existence it self, which determines a Being of any sort to a particular time and place incommunicable to two Beings of the same kind" [2.27.3; 330] What excludes every other body from the place-time of a body is its solidity, or the impenetrability resulting from its solidity. But what is it that excludes another spirit from the place of a spirit? Nothing from what I can make out in Locke. Only if there is but one sort of being, viz. solid being, can Locke's principle of individuation be made to work. Creation of any sort, then, is the creation of solidity.

Finally, there is a remarkable passage from Book Four in which Locke speculates about the creation of matter. His contention is that while the creation of matter is inconceivable it is nonetheless possible, because the creation of spirit is also inconceivable yet undeniable since there was a time at which each of us began to exist. "When well considered, Creation of Spirit will be found to require no less Power, than the Creation of Matter. Nay possibly, if we would emancipate our selves from vulgar Notions, and raise our Thoughts, as far as they would reach, to a closer contemplation of things, we might be able to aim at some dim and seeming conception how Matter might first be made, and begin to exist by the power of that eternal first being: But to give beginning and being to a Spirit, would be found a more inconceivable effect of omnipotent Power. But this would perhaps lead us too far from the Notions, on which the Philosophy now in the World is built, [thus] it would not be pardonnable to deviate so far from them".[4.10.18; 628-g] Leibniz picked up on this and actually had a correspondence about it during 1704-05 with Lady Masham, at whose house at Oakes Locke was a guest. But Locke died before Lady Masham got around to asking him about it. In the New Essays Leibniz offers a conjecture on what Locke might have had in mind, but it seems to me that he was misled by the transla-
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tor of the Essay he read. Newton too became involved in the story, curiously via the same translator; he too had an explanation of what Locke had in mind. This part of the story has recently been told by J. Bennett and P. Remnant and will come out in a moment. [43] But there is more to the story. Reid, for example, was struck by the passage: "There is, indeed, a single passage in Locke's essay [4.10.18], which may lead one to conjecture that he had a glimpse of that system which Berkeley afterwards advanced, but thought proper to suppress it within his own breast." [44] After a not obviously unfaithful reading of the text, Reid compares it with Berkeley's views. "According to Berkeley's system, God's creating the material world at such a time, means no more but that he decreed from that time, to produce ideas in the minds of finite spirits, in that order and according to those rules which we call the laws of nature. This, indeed, removes all difficulty, in conceiving how matter was created; and Berkeley does not fail to take notice of the advantage of his system on that account." [45] In characteristic fashion Hamilton pursued the matter, pointing out that a different reading was given by Dugald Stewart, who said of the passage "when considered in connection with some others in his writings, it would almost tempt one to think that a theory concerning matter, somewhat analogous to that of Boscovich, had occasionally passed through his mind." [46] In Hamilton's view, "The whole arcanum in the passage in question is, however, revealed by M. Coste, the French translator of the Essay, and of several other of the works of Locke, with whom the philosopher lived in the same family, and on the most intimate terms, for the last seven years of his life: and who, though he has never been consulted, affords often the most important information in regard to Locke's opinions. To this passage there is in the fourth edition of Coste's translation, a very curious note appended, of which the following is an abstract:--"Here Mr. Locke excites our curiosity without being inclined to satisfy it. Many persons, having imagined that he had communicated to me this mode of explaining the creation of matter, requested, when my translation first appeared, that I would inform them what it was; but I was obliged to confess that Mr. Locke had not made even me a partner in the secret. At length, long after his death, Sir Isaac Newton, to whom I was accidentally speaking of this part of Mr. Locke's book, discovered to me the whole mystery. He told me, smiling, that it was he himself who had imagined this manner of explaining the creation of matter, and that the thought had struck him one day, when this question chanced to turn up in a conversation between himself, Mr. Locke, and the late Earl of Pembroke. The following is the way in which he explained to them his thought: 'We may be enabled (he said) to form some rude conception of the creation of matter, if we suppose that God, by his power, had prevented the entrance of anything into a certain portion of pure space, which is of its nature penetrable, eternal, necessary, infinite; for henceforward this portion of space would be endowed with impenetrability.
one of the essential qualities of matter: and as pure space is absolutely uniform, we have only again to suppose that God communicated the same impenetrability to another portion of space, and we should then obtain in a certain sort the notion of the mobility of matter, another quality which is also very essential to it."[47]

The result, according to Hamilton, is that Stewart's hypothesis gains at the expense of Reid's. A.C. Fraser later was led by Newton's account to combine the hypotheses of Reid and Stewart. "This 'dim conception' [how matter might be created], if it means that the material world may be resolved into a constant manifestation of God's power to man's senses, conditioned by space, so far coincides with Berkeley's account of it; he emphasises the sensuous manifestation of divine power in selected spaces, as well as the ultimate dependence of space on sense. Newton, it seems, suggested that 'creation of matter' means, God causing in sentient beings the sense-perception of resistance, in an otherwise pure space—a theory akin to Berkeleyanism in its recognition of the Supreme Power, and to Boscovich in its conception of the effect."[48]

But against this line of interpretation there seem to me two invincible objections. One is that it seems to require an absolute space which is inimical to Locke's conception of space no less than it is to Berkeley's. Newton seems to have had, rather than Locke's, his own view in mind."... There are everywhere all kinds of figures, everywhere spheres, cubes, triangles... even though they are not delineated by sight. For the material delineation of any figure is not a new production of the figure as regards space, but only a corporeal representation of it, so that what was first insensible in space now appears to the senses to exist."[49] For Locke, as we have seen, space apart from the things in it is, as it was for Bernier, a pure nothing. But the major objection is that Locke insists that impenetrability, in which matter entirely consists when conceived as the puncta of Boscovich, is negative and only the result of solidity. For what it is worth we may note that Coste himself rejected Newton's account on this ground.[50]

The two objections really come to the same thing. The Newtonian suggestion requires that there be something immaterial ontologically prior to impenetrability. This might be an assemblage of non-spatial things which either with or without the superaddition of impenetrability might be perceived spatially. Spirits or Leibnizian monads would be examples of such things. But the only historically plausible view would be for space, conceived absolutely, to have its parts endowed with impenetrability. But Locke rejects absolute space. What is ontologically antecedent to impenetrability is solidity, which is what God creates when he creates matter.
I have thus far spoken of solidity as a property, indeed as the property on which all the other properties of body depend. But this is a mistake. For Locke is not just a nominalist, but what Loux calls an extreme nominalist—not only are there no universal properties, but there isn't even an ontological distinction to be drawn between properties and things. So Locke is faced with something like a Kantian problem in attempting to say anything at all about solidity, which is for him the real thing-in-itself. The problem is that nothing can be said of it. To predicate for Locke is to express an agreement or disagreement of ideas. Predication is thus limited to complex ideas as when we say of substances that they have certain modes or stand in certain relations. Thus predication is restricted to the way solidity appears to us. Our knowledge of these appearances is, if you like, knowledge by description; but of solidity itself we have only knowledge by acquaintance. I think this is what Locke is telling us when he says:

If anyone asks me, What this Solidity is, I send him to his senses to inform him: Let him put a Flint, or a Foot-ball between his Hands; and then endeavor to join them, and he will know. If he thinks this not a sufficient Explication of Solidity, what it is, and wherein it consists; I promise to tell him, what it is, and wherein it consists, when he tells me what thinking is, or wherein it consists; or explain to me, what Extension or Motion is, which, perhaps, seems much easier. The simple Ideas we have are such, as experience teaches them us; but if beyond that, we endeavor, by Words, to make them clearer in the Mind, we shall succeed no better, than if we went about to clear up the Darkness of a blind Man's mind, by talking; and to discourse into him the Ideas of Light and Colours.[2.6.61 127]

Notice too that this reading saves Locke from an error sometimes attributed to him, viz. that in this passage he confuses solidity with impenetrability, for what we feel is not solidity but impenetrability. Though he could never express it in these terms, Locke is giving a transcendental argument—we don't sense solidity as we would an appearance, we know it. If there are phenomenal appearances, there must be noumenal things that appear, and which are thus known in abstraction from anything that can be said of them. Berkeley who was wrong about so much in Locke was right about the fundamental point, viz. that the basis for Locke's realism is an appeal to non-empirical abstraction, which he is thus at great pains to attack.
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FOOTNOTES


3. Ibid., 95.

4. Ibid.

5. Ibid., 105.

6. Ibid., 94.


10. This was pointed out to me by James Pettit.

11. Patrick Maynard tells me this is Sam Lloyd's "15 Puzzle".


14. Ibid.


16. Ibid.

17. Ibid., 65.


22. Ibid., 85.

23. Treatise, ed. Selby-Bigge, 70.

24. Ibid., 69.


26. Ibid.

27. Ibid., 131.

28. Ibid., 131-2.


30. Ibid., 235-6.

31. Ibid.

32. Ibid., 235-6.

33. Ibid., 249.

34. Ibid., 250.

35. Ibid., 249.

36. Ibid., 248.

37. Ibid., 249.

38. Ibid., 247-8; 24.


40. 2.25.2; Mattern, 62.

41. Ibid.

42. D.A. Larivere is the principal originator of this thesis, in unpublished work.

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44. Essays on The Intellectual Powers of Man, II, 10.
45. Ibid.
46. Philosophical Essays, ii, i. Quoted by Hamilton, Note F.
47. Ibid.

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