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The Mystery of the Physical and the Matter of Qualities:

A Paper for Professor Shaffer¹

1. Introduction: A Russellian Respect for the Mystery of the Physical

For some fifty years now, nearly all work in mainstream analytic philosophy has made no serious attempt to understand the *nature of physical reality*, even though most analytic philosophers take this to be all of reality, or nearly all. While we've worried much about the nature of our own experiences and thoughts and languages, we've worried little about the nature of the vast physical world that, as we ourselves believe, has them all as only a small part.

In this central respect, we've been very different from the man emerging as the century's preeminent analytic philosopher, Bertrand Russell. While Russell thought hard about the things that have preoccupied us, *he also thought hard about the nature of physical reality*. Why has there been such a great disparity?

By contrast with Russell, most contemporary workers in core analytic areas just assume that, largely as a legacy from the physical sciences, we have been granted a happily adequate

¹ In 1995, David Lewis dedicated a paper to Professor Jerome Shaffer, his undergraduate philosophy teacher, for the occasion of Jerry Shaffer's retirement from teaching philosophy: "Should a Materialist Believe in Qualia?," *Australasian Journal of Philosophy*, 1995, at 140-44, and *Faith and Philosophy*, 1995, at 467-71. Now, I much more belatedly dedicate this paper to Shaffer, who was also my undergraduate philosophy teacher. Not only for his understanding and encouragement, but especially for that, I'll always be grateful to Jerry Shaffer.

For many years, Shaffer's thought hard about the relation between the mental and the physical. Now, I try to write usefully about part of what may be sustaining his thinking.

With this effort, help came from many others: In the Fall of 1997, it was discussed by those regularly attending the graduate seminar I gave at NYU with John Gibbons. In addition to Gibbons, I gratefully thank Mark Bajakian, David Barnett, Geoff Helmreich, Peter Kung, Brian Leftow, Barbara Montero, and Sebastien Pennes. Grateful thanks also go to Robert Adams, David Armstrong, Gordon Belot, Michael Della Rocca, Hartry Field, Kit Fine, Brian Loar, Michael Lockwood, Barry Loewer, Graham Priest, Michael Rea, and Galen Strawson. For almost incredible efforts, very special great thanks go to John Carroll, John Heil, and C. B. (Charlie) Martin.

conception of physical reality: Thanks to physics, we have a pretty good understanding of physical reality, even if there may be some serious deficiencies our understanding.

When in this frame of mind, we philosophers aren't moved to think hard about the nature of physical reality, even if we believe it to be all of reality. Rather, we're much more moved by thoughts like this: "Let's leave such terribly large matters to so many successful scientists, and to the few philosophers so concerned to interpret the work of the many."

Just so, when we trouble ourselves about what's what with things grossly physical, or with physical reality that's extralinguistic, and extramental, and so on, our concerns are with quite superficial matters. For example, we may reflect on the apparent fact that, if an ordinary rock should be split down the middle, with the two resulting "halves" never even coming close to being rejoined, the rock that was split ceases to exist, whilst two substantially smaller rocks then begin to exist. And, then, we may reflect on the apparent fact that, when a rock that's as famous as Plymouth Rock is similarly bisected, there's still that rock that's then in two salient pieces, whether or not there are also two smaller rocks then coming into existence. Based on these two reflections, we may aspire to a complex theory that, "capturing intuitions" about both cases, will serve to illuminate the "persistence conditions" for rocks in general, both the famous and also the obscure. But, won't such a theory reflect our own interests more than it will tell us about the nature of physical reality? At all events, it won't deliver anything very deep, or very illuminating, about physical reality.

Even while knowing all that very well, we still don't trouble ourselves to be more searching. Rather, we're still affected by thoughts like "Let's leave such terribly large matters to so many successful scientists, and our few colleagues who know their science." Especially in this fearfully complacent philosophical day and age, we do well to remember what Russell counseled: About the rest of concrete reality, we don't know anything nearly so intimately, nor nearly so fully, as we know our experience or, maybe better, as we know the phenomena apprehended in experience. (This remains true, of course, even if what we know most fully, and intimately, might be known less fully, and less intimately, than it can often appear.) And, we do

well to recall that Russell did not exaggerate much, if at all, when, in a generally robust epistemological spirit, he said, "as regards the world in general, both physical and mental, everything that we know of its intrinsic character is derived from the mental side."² Nor did he exaggerate very much when, in a specifically materialistic spirit, he said, "we know nothing about the intrinsic quality of physical events except when these are mental events that we directly experience."³ If there's to be appropriately ambitious analytic philosophy done any time soon, then we'd best pay heed to such Russellian reminders. And, though our philosophical efforts might diverge from his in many respects, they should be guided by the same realization that so greatly moved Russell: Except for what little of the physical world we might apprehend in conscious experience, which is available if materialism should be true, *the physical is mysterious to us*.

So, we should wonder: To what extent, if any at all, do we have a philosophically adequate conception of physical reality? Do we have a conception well enough related to the human mind for it to ground a metaphysic in terms of which physical reality can be understood, at all well, by us very limited human thinkers?

Inspired by Russell and others, I'll try to give decent answers to such daunting questions. In the course of the effort, I may do more toward raising further questions than toward giving decent answers. But, if they are fresh questions, that might be all to the good.

2. A Brief Exposition of the Scientific Metaphysic

² Bertrand Russell, *The Analysis of Matter*, London: Kegan Paul, 1927, page 407. My own copy of the work is a reprinting by Dover Publications, New York, 1954. In that, see page 402. Anyway, the quoted words are from the book's penultimate sentence.

³ Bertrand Russell, "Mind and Matter," in *Portraits from Memory*, Nottingham: Spokesman, 1956, 153. Until recently, truths like those just quoted were, for centuries, influential with serious philosophers. For a seminal example, "the father of modern philosophy" advances some in Descartes' *Principles of Philosophy*, Part One, Paragraph 11, "How our mind is better known than our body," as in *The Philosophical Writings of Descartes*, Volume I, Cambridge University Press, 1985, Translated by J. Cottingham, R. Stoothoff, and D. Murdoch.

As a first step in this effort, I'll sketch, very briefly, what I take to be the metaphysical worldview that, for several centuries and with no let-up anywhere in sight, has been the dominant metaphysic of the highly educated in cultures much affected by the development of the natural sciences. It will be useful to have a memorable name for this dominant worldview; but not a name loaded with positive connotations, like "the scientific metaphysic," or with negative ones, like "the scientistic metaphysic." For a name that's reasonably memorable and neutral, I'll introduce a word that's meant to parallel "philosophical" and, with it, I'll coin the naming phrase "the *scientific* metaphysic."

Though various modifications of it appear required by certain 20th century scientific developments, notably, by quantum mechanics and relativity theory, the heart of our scientific metaphysic is, apparently, essentially the same as before the advent of the twentieth century. So, even if folks versed in contemporary physics would rightly prefer esoteric analogues of the ordinary terms I feel most comfortable using for the job, for my main philosophical purposes the following few paragraphs may serve to express our dominant worldview.

First, differently distributed in space at different times, there is physical stuff or *matter*. Placing aside the thought that this matter may have been, very long ago, created by some Extraordinarily Powerful Mind (or Minds), and placing aside thoughts of how such a SuperMind might, even nowadays, occasionally affect matter, this matter is *independent of minds*: To exist, the matter needn't be sensed by, or be thought about by, sentient beings.

Second, (again placing to the side all such "theological" ideas, which from now on will generally be done only implicitly) insofar as it's determined by anything at all and isn't merely random, the distribution of this matter at any given time is determined by the distribution of the matter at earlier times, with the determination proceeding in line with our world's basic natural laws, which are physical laws.

Third, owing to the variety in these material distributions, at certain times some of the world's matter, or possibly much of the matter, is configured so as to compose various complex material structures and systems, ranging from the slightly complex through the fairly complex to the

highly complex. Among the more complex of even these highly complex material structures and systems are living entities, or those serving to constitute living entities.

Fourth, among the more complex of even these living material entities, and possibly even among some (very distant) nonliving material complexes, there are those that are thinking, feeling, experiencing physical entities. Or, more cautiously, complexly composed of some matter, there are the living physical bodies of such thinking physical entities.

Fifth, there are certain properties that are the *naturally important* properties of matter, both matter that's involved in composing a highly complex material system and, equally, matter that's never so interestingly involved. To date, it's mainly been the work of physics to discover what actually are these properties.

Sixth, beyond what physics aims to discover, there are other naturally important properties. The most salient of these properties are to be found in a most intimate connection with the minds of the sentient beings of the world: These salient properties will qualify the conscious immediate experiences of these beings; or, if not quite that, they'll qualify whatever it is that such beings most immediately experience, perhaps manifolds of qualia. So, these properties will include (absolutely specific) phenomenal color properties and, just as well, (absolutely specific) phenomenal pain properties. None of these properties are, of course, even remotely like mere powers of material bodies to promote, in finite minds, any sort of experience. Because they figure prominently in my inquiry, I'll refer to the phenomenal properties as the *Qualities*, which capitalized term I'll reserve for them and only such other properties as are strongly and deeply analogous to phenomenal properties.

Seventh, the six preceding paragraphs are to be understood as implying that our scientific metaphysics conflicts with many traditional metaphysical systems, even while it's not in conflict with many others. Thus, while Berkeley's subjective idealism conflicts with our scientific metaphysic, other metaphysical views comport with it well. For example, Descartes's dualism, or at least a view much like the Cartesian metaphysic, provides a consistent line for further

specification of our scientific metaphysic. And, it appears, a materialistic worldview provides a quite different consistent line.

While I've sketched the main thrust of our scientific metaphysic in the seven paragraphs just preceding, I've ignored some very large matters. For example, I've offered nothing about what this metaphysic might say, or might not say, regarding questions of genuine choice, or free will. Still, even with only as much of the scientific metaphysic as what's been presented, there may be raised questions of philosophical importance. In this paper, we'll explore some of them.

3. This Metaphysic, Three Kinds of Property and the Restriction of Qualities to Minds

For a discussion that we may hope to be as profitable as it's protracted, I'll move deliberately toward displaying a doctrine that's assumed true by most who embrace the scientific metaphysic, even if it might not be so much as actually implied by the dominant worldview. Toward succinctly presenting this popular proposition, which I'll call the *Restriction of Qualities to Minds*, it will be useful to notice *three categories of basic natural property* (of whatever entities, or entity, might serve to constitute physical reality.)

First, I'll take note of what might be called the purely *spatiotemporal* properties or, for short, the *Spatiotemporals*. Central to this group are, with one exception, what Descartes regarded as "the primary or real properties of matter ... shape, size, position, duration, movability, divisibility and number. This list we can immediately diminish by one, because it is clear that *number* is an interloper here."⁴ As concrete reality might have very many dimensions, this group may include, in addition to geometric properties, topological properties and, perhaps, other such "mathematically-recognized" properties. Of course, even such determinables as Descartes's are just a starting point here; more to the concrete point are such absolutely specific determinate properties as, say, *being perfectly spherical*.

⁴ The quote is from David Armstrong, *Perception and the Physical World*, London: Routledge and Kegan Paul, New York: Humanities Press, 1961, page 184. For Descartes's list, Armstrong refers us to "the second paragraph in the Fifth Meditation, and elsewhere."

As I'm understanding the Spatiotemporals, even absolutely empty regions will, at least when limited in some dimensions or respects, have Spatiotemporal properties whether at an instant or over time, even if they might be devoid of all other basic properties. And, at least in many possible worlds, there's nothing more to the having of Spatiotemporal properties than what a perfectly empty region has, at an instant or over time.

As I'm painfully aware, the scientific metaphysic *might not* help provide us with any understanding of concrete reality that's even modestly adequate. But, if it does profit us in that large regard, then we must think of very much of this reality, even if not absolutely all of it, as having spatiotemporal properties. Indeed, though I'm far less confident of it, I suggest that we should accept even this much more ambitious proposition: For the scientific metaphysic to do much *for our understanding* of concrete reality, there must be *some* truth in the thought that much of this reality has the three-dimensional nondirectional spatial structure, and the correlative one-dimensional directional temporal structure that, in our conscious perception of reality, are spatiotemporal properties that physical reality appears to have. For, while such perception might provide us with only a *very partial perspective* on reality, and with a *quite superficial* perspective, still and all, unless there's *something about physical reality* in virtue of which it has these familiar spatiotemporal properties, the scientific metaphysic will, I think, do far more toward providing intellectual illusion than toward giving us even a very modestly adequate understanding of reality. But, in the present essay, I will rely only on less ambitious propositions. At all events, so much for my first category of basic natural properties, the Spatiotemporals.

Second, I'll notice what, for want of a better expression, I'll call the *propensity properties* or, more briefly, the *Propensities*. Often, these properties, or some of them, have been called "powers"; but, inappropriate for us, that term connotes positive force. Others have called the

properties "dispositions"; but, despite the valiant efforts of C.B. Martin and others, that term has been so badly abused that it will arouse, in the minds of too many, undue confusion.⁵

Now, at least for the meanwhile, we'll understand the Propensities as being distinct from, even if they might be importantly related to, the Spatiotemporals. On this understanding, regions of absolutely empty space, or perfect vacuums, can have spatiotemporal properties; but, as it at least appears, no such physically empty regions will themselves have any powers or, as I'll say, any Propensities. By contrast with such vacuums, we may envision a finite spatial region that's precisely occupied by an electron, where our supposed electron is well suited to making true an early theory of such supposedly simple physical things. Then, what's in that small finite region will be something that has, in addition to its spatiotemporal properties, *unit negative electric charge*. Its having *that* property is, we may suppose, the electron's having a certain complex Propensity or, perhaps the same, its having a cluster of simpler Propensities. The complex Propensity of our electron will include, for salient examples, its Propensity to repel any other electron with such-and-such a force in so-and-so a direction, and its Propensity to attract any proton with such-and-such a force in so-and-so a direction. As with any entity's having any Propensity, the electron's having this one is not dependent, not even in the minutest degree, on there ever actually being any protons, or there being any other electrons. In contradistinction to there being any *chance for* the Propensity of our electron to be *manifested*, which does require there to be things external to it, the electron's *just having* the indicated Propensity doesn't depend on there ever being *any* such external entity.

Third, and last, I'll notice what I call the *Qualities*, a group of properties whose most accessible members are the phenomenal properties available in our conscious experience. But, the Qualities may also include other properties: Beyond the properties experientially available to

⁵ Though some of Martin's writings on this subject are very hard to understand, others are helpfully clear. For work that helps clarify the fact that *dispositions are as categorical as anything*, see C.B. Martin, "Dispositions and Conditionals," *The Philosophical Quarterly*, 1994, and Martin's contribution to *Dispositions: A Debate*, D. M. Armstrong, C. B. Martin, U. T. Place, ed. Tim Crane, Routledge, 1996.

us, and even beyond those available to any of the world's finite minds, there may be properties that are *deeply analogous to* at least some of the phenomenal properties. Through *extrapolative analogical thinking*, perhaps we might get some grasp as to the nature of some of these further-fetched properties, even if, perhaps, never a grasp that's very rich, firm, or clear. So, on the one hand, consider those phenomenal properties best suited to filling space, or to being spread through space. Here, we may consider a perfectly specific sort of translucent red, and an equally specific "colorless transparency," as with what's apprehended in experience of, say, a typical window pane, and an equally specific "silveriness," as with what's experienced in, say, seeing some shiny silver. Since they're so well suited to filling space, we'll call these *Extensible Qualities*. Now, and on the other hand, consider some phenomenal properties that seem *unsuited* to filling space. Here, we may consider a perfectly specific sort of taste of sweet chocolate, and a perfectly specific sort of pleasant sound, as with what's apprehended in one's experience of, say, a certain rendition of a favorite song, and a perfectly specific sort of elation, as with what's experienced upon, say, hearing some wonderful news. Since they're so unsuited to filling space, suppose, we'll call them *NonExtensible Qualities*. Now, we can have a conception, it appears, of properties that, though they're *not* available in experience to the world's finite minds, are very much *more like each* of our indicated Extensible Qualities than they're like *any* of our indicated NonExtensible Qualities.

The qualities we're analogically contemplating are very much more like our indicated Extensibles than our indicated NonExtensibles both overall and, as well, in those respects, whatever precisely they may be, that have our Extensibles be so very much more suited to filling space than are our NonExtensibles. By way of such extrapolative analogical thinking, I'm suggesting, we may have a contentful conception of (even if not yet any reason to believe in) a world featuring many instantiations of Extensible Qualities that can't, at least as a matter of natural fact, be experienced by any of the world's finite minds. In parallel, we can also conceive of properties that, though they're likewise unavailable to experience, are much more like each of our indicated *NonExtensible Qualities* than they're like any of our indicated Extensible Qualities.

Here, too, there may be properties that, though they're not properly phenomenal properties, are among a world's further-fetched Qualities.

In marked contrast with how things were fifty years ago, nowadays it appears almost universally believed by analytic philosophers that the phenomenal properties are properties of, and only of, conscious experiences; and, rather than being any mere contingent truth, this belief runs, it's conceptually and necessarily true that the phenomenal properties are all properties of, and only of, the mental, and even just the experiential. Let's suppose this belief is correct. Then, it might be that, though the phenomenal color properties *seem well-suited* to filling space, that's an illusory appearance. For, as far as any of us can tell, it might be that conscious experiences can't literally occupy spatial regions.

Let's further suppose that, whether or not for that reason, none of the phenomenal properties are actually Extensible, are Qualities well suited to filling space. Well, even in such an event, it's still true to say this: The phenomenal properties may be peculiarly helpful leads for our only quite partially grasping, through extrapolative analogical thinking, Qualities whose instances *are* so prevalent in our mind-independent spatio-temporal reality.

Having said that, I'll also say this: Apparently against almost all other contemporary analytic philosophers, I *don't* believe that the phenomenal properties are features only of conscious experiences. Rather, I'm quite agnostic. Toward explaining this unfashionable agnosticism, in the next section I'll offer two sorts of consideration. Here, it suffices to note that the present project doesn't depend on what's the best approach to this interesting issue. To indicate what's much more relevant, I display this from Russell:

To assert that the material *must* be very different from percepts is to assume that we know a great deal more than we do in fact know of the intrinsic character of physical events. If there is any advantage in supposing that the light-wave, the process in the eye, and the process in the optic nerve, contain events qualitatively continuous with the final visual percept, nothing that we know of the physical world can be used to disprove the supposition.

The gulf between percepts and physics is not a gulf as regards intrinsic quality, for we know nothing of the intrinsic quality of the physical world, and therefore do not know whether it is, or is not, very different from that of percepts. The gulf is as to what we know about the two realms. We know the quality of percepts, but we do not know their laws so

well as we could wish. We know the laws of the physical world, in so far as these are mathematical, pretty well, but we know nothing else about it. If there is any intellectual difficulty in supposing that the physical world is intrinsically quite unlike that of percepts, this is a reason for supposing that there is not this complete unlikeness. And there is a certain ground for such a view, in the fact that percepts are part of the physical world, and are the only part that we can know without the help of rather elaborate and difficult inferences.⁶

At all events, at least for the meanwhile we may understand the Qualities as being distinct from, though perhaps importantly related to, both the Spatiotemporals and the Propensities. On this understanding, while the spatiotemporal properties can be possessed by regions of absolutely empty space, it is at least somewhat doubtful that any of the Qualities, including even any of the Extensible Qualities, can be possessed by an *absolutely* perfect vacuum. For now, that's all for this last sort of basic natural property.

With this threefold classification providing the context for it, I can briefly display the doctrine that, at this section's start, I said was assumed by most who hold with the scientific metaphysic, even if it's not actually implied by the dominant worldview:

The Restriction of Qualities to Minds. Unlike the Spatiotemporal properties and the Propensities, which are so widely instantiated in what's physical, there are not (any instantiations of) any of the Qualities in physical reality, with the possible exception, at any given time, of such a small part as may subserve the minds of sentient beings.

According to the *Restriction*, to use this doctrine's short name, all the world's matter, or almost all, has no Qualities, whatever might be its Spatiotemporal properties and its Propensities.

Though they need fleshing out if they're ever to be of much philosophical interest, here are a couple of questions that, I'll suggest, may already be of some interest: If we *add* the Restriction to our scientific metaphysic and, thus, obtain a *deeply segregated* worldview, what will be, for us, the advantages of, and the disadvantages of, such a view of the world? On the opposite hand, if we add the *Denial* of the Restriction to our scientific metaphysic, obtaining a *deeply integrated* worldview, what will be the advantages and disadvantages?

⁶ Bertrand Russell, *The Analysis of Matter*, London: Kegan Paul, 1927. My copy is a reprinting by Dover Publications, New York, 1954. In this reprinting, see pages 263-64.

4. Might Phenomenal Qualities Outrun Experience?

Before inquiring into the implications of the Restriction, which will soon be my main order of business, I'll offer two groups of ideas, each complementing the other, that serve to motivate this pretty unusual philosophical stance of mine: Apparently against almost all my analytically philosophical contemporaries, I *don't* believe that the phenomenal properties are possessed only by experiences. Rather, I'm agnostic about the matter. Though providing motivation for this unfashionable stance isn't crucial for my project, my doing that will help contemporary readers appreciate, rather well, what I mean to say about the implications of the Restriction.

For the first group of motivating ideas, I'll quote at length from Michael Lockwood's wonderfully stimulating book, *Mind, Brain and the Quantum*:

I find it plausible to suppose that the phenomenal qualities themselves are less fickle than one's attention, and may persist even when one's awareness of them lapses. On this view, phenomenal qualities are neither realized by /being sensed nor sensed by being realized. ... The realization of a phenomenal quality is one thing, I contend; its being an object of awareness is something else,

At first hearing, the present proposal may seem wildly eccentric.

.... But now consider the following example. Suppose we have three colour patches projected close together on to a screen; call them *L* (left), *M* (middle) and *R* (right). Suppose, further, that in the absence of *R*, *L* is indistinguishable from *M*, and that in the absence of *L*, *M* is indistinguishable from *R*. *L*, however (in the presence or absence of *M*), *is* distinguishable from *R*. ... So what are we to suppose happens if we start with a screen containing only *L* and *M*, which are *ex hypothesi* indistinguishable, then add *R*, so that all three patches are present, and finally remove *L*, leaving *M* and *R*, which are likewise indistinguishable?

There are only two possibilities, surely. By far the more plausible, to my mind, is that the phenomenal colours corresponding to *L* and *M* are distinct, even in the absence of *R*: there *is* a phenomenal difference here, but one too small to register in consciousness, no matter how closely the subject attends. Adding together two phenomenal differences of this magnitude does, however, produce a difference that registers in consciousness; hence the subject's ability to distinguish *L* from *R*. The only alternative is to suppose that the effect, either of adding *R* or of removing *L*, is to induce a qualitative change in the phenomenal colour corresponding to one or the other of the remaining patches. But it surely won't *seem* to the subject that this is what happens. So on this supposition too, there would be phenomenal differences - or at least, phenomenal *transitions* - that defied conscious detection.

Not only, in such perceptual cases, does the phenomenal character of what one is immediately aware of outrun one's awareness of it; it actually seems to do so. What I am suggesting, in effect, is that we should allow phenomenal qualities quite generally to outrun awareness. Those who think they understand what it is for phenomenal qualities to inhere in portions of their visual field of which ... they are not currently conscious, now have a model for what, ... the unsensed portion of the physical world is like in itself, quite generally - even in regions beyond the confines of the brains of sentient beings, where awareness, as far as we know, never intrudes.⁷

These passages provide extremely suggestive argumentation, even if no decisive argumentation, to the effect that there are instances of phenomenal color qualities that outrun experience (and also *fairly* suggestive reasoning that these Qualities outrun even nonconscious mentality.)

Much as the quotation from Lockwood indicates, insofar as philosophers now think they have difficulty understanding the suggestion that phenomenal qualities may outrun mentality, it's generally because they think they have difficulties with the suggestion that phenomenal qualities might ever outrun *conscious* mentality. But, what's just quoted serves to confute the latter thought. So, most of these philosophers should reject the former as well.

While many may still find it hard to *believe* phenomenal properties outrun all of mentality, myself included, by now few should have trouble with the thought that the suggestion is a *coherent* proposition. With that said, there's enough from the first group of motivating ideas.

For the second group of ideas, I'll relate the results of some bouts of phenomenological thinking, and some analysis pertaining thereto: When lying still in silence and darkness, sometimes I vividly experience my body as filling space. Then, it appears, I apprehend *Qualities felt as suffusing space*. Naturally enough, I'll call these Extensible Qualities the *Felt Bodily Qualities*. Now, with the *Felt Bodily Qualities* I can conceive *only* of there being such instances as are *experienced*; indeed, with *these* Qualities, I conceive only of such instances as are *experienced as extending through space occupied by (some of) a being that experiences them*.

By contrast with the Felt Bodily Qualities, it seems clear, I can conceive of there being instances of *color* Qualities that *aren't* ever experienced; indeed, I can do that about as well, it

⁷ Michael Lockwood, *Mind, Brain and the Quantum*, Basil Blackwell, 1989, pages 164-65.

appears, as I can conceive instances that *are* experienced. (To me, this has been intuitive for as long as I can remember, long before any encounter with *arguments* in support of such an idea, like what's just been displayed from Lockwood.)

In marked contrast to the phenomenal colors, it appears, the Felt Bodily Qualities are *essentially mental* Qualities, which can be instanced only when they figure in experience. By that same contrast, the phenomenal colors, and the Extensibles strongly analogous with them, *aren't essentially mental* Qualities, and can be instanced *even when they don't* figure in experience. So, as it appears, we have tolerably clear conceptions of two quite different sorts of Extensible Quality. Considerations like these serve to motivate my agnosticism as to whether the phenomenal qualities may outrun experience, or even mentality.

Having had both groups of motivating ideas presented, perhaps readers will be sympathetic with the idea that the phenomenal qualities can outrun experience. And, with that reasonably open-minded stance, perhaps they'll appreciate, rather well, what I'll now say about the implications of the Restriction. At all events, it's high time for that main order of business.

5. The Restriction, Particles in Space and Spaces in a Plenum

For the scientific metaphysic to provide us with a reasonably adequate view of our world, do its bare bones need such Qualitative flesh as can be had only with the Denial of the Restriction? My conjecture is that the question receives an affirmative answer.

Toward motivating this conjecture, I'll *suppose that the Restriction holds* and, in terms of the scientific metaphysic as thus limited, I'll begin two *extremely simple attempts to characterize* our world. (Toward the Restriction's being fully in force, I'll stipulate that both are mainly aimed at characterizing the world well before there were any [finite] minds.)

First, and familiarly, I'll begin an attempt to characterize physical reality in generally Newtonian terms: Moving about in what's otherwise uniformly empty space, there are many particles of matter, grandiosely labeled Particles, whose motion is governed by physical laws. In

that we're supposing the Restriction to hold, we must suppose that, in this *Particulate World*, the laws concern only NonQualitative properties that the might Particles have, not Qualities.

Second, and unusually, I begin this attempt to characterize physical reality: In what's otherwise a continuous material plenum, or a continuous field of matter, there are little perfectly empty spaces, or absolute vacua, or *Bubbles*: As regards both shape and size, each Bubble is precisely similar to a certain Particle, its *counterpart* Particle, in the Particulate World. And, wherever there's a Particle in our Particulate World, there's a counterpart place with a counterpart Bubble in this *Plenumate World* . So, if there are eight spherical Particles arrayed in a quite cubical pattern in a certain region of our Particulate World, then in the counterpart region of our Plenumate World there'll be eight such Bubbles arrayed in just such a pattern.

Even as various Particles may instance certain physical properties that will have them be suited for governance by certain physical laws, so various regions of a physical Plenum may have certain correlative physical properties that will have them be correlatively suited for governance by apt parallels of, or nice inversions of, the Particle-governing laws. So, in a nice parallel with the law-governed behavior of the Particles in our Particulate World, this Plenumate World features laws governing the distribution of its Plenum throughout all its time. And, since its Bubbles always *are* at just the places in the World where there *isn't* any Plenum, this World's laws also serve to determine the distribution of all its *Bubbles* over time. So, our Plenumate World's Bubbles will move through its material field along trajectories that, over time, perfectly parallel the trajectories of the Particulate World's Particles through its empty space.

Always supposing the Restriction holds, I'd make two extremely simple attempts, it appears, at starting to characterize our world. Before concluding the section, it may be useful to comment on what may be the two most salient respects in which my attempts were so simple.

First, there's the point that my attempts were conducted in the general framework of classical physics, with its quite intuitive conceptions of space and of time, rather than the framework of more recent physics, with its quite *unintuitive* conceptions, like the notion of *spacetime*. One reason for this, I blush to confess, is that I know precious little about contemporary physical

science. A more important reason is that I'm engaged in an endeavor that's meant to transcend the differences between classical physics and more recent scientific developments. And, it's perfectly possible, it appears, for there to be an endeavor that succeeds in being that comprehensive: Since recent scientific developments make no Completely Revolutionary Break with earlier science, what's new in the recent scientific conceptions doesn't affect the question of how we might, with the Restriction fully in force, ever have an intelligible worldview that, far from being any sort of idealism, is an adequate specification of the scientific metaphysic.

Apparently with complete sincerity, that's what I've been told by philosophers knowledgeable about contemporary physics. So, apparently, my employing the framework of classical physics means no loss of generality for these philosophical exercises.

Second, there's the point that, in trying to characterize a Particulate World, and also a Plenumate World, I forswore saying anything about complex material structures, or systems, much less anything about any minds that any material complexes might subserve. That was done for several reasons, the most important being that such a simplification would be helpful toward having the Restriction be fully in force. Even if it might be unnecessary, I'll again implore my readers: When trying to think of a Particulate World, *don't do anything even remotely like*, say, thinking of *light grey* spheres moving through a *dark grey* space or field; and, when attempting thoughts of a Plenumate World, don't do anything even remotely like thinking of dark grey spheres moving through a light grey space or field!

For holding to this supposition, it will be useful to discuss some relations regarding the scientific metaphysic, the instantiation of Qualities, and "the place of mind in the world order," or, as it might turn out, what just appear to be some such relations: Even while they try to have the Restriction be in force, some may have these following thoughts regarding the scientific metaphysic. As our dominant metaphysic seems fully to allow, where and when a World features creatures with conscious minds, there and then there'll be someplace in the World for Qualities to be instantiated. So, if we should endeavor to characterize, say, a Particulate World, at greater length, then, as we may make specifications for complex living material creatures, and

so consciously experiencing creatures, we may thus characterize a part of the world in which Qualities will be instanced, even whilst supposing the Restriction to hold. So, if we just go further in our attempts to characterized Worlds, even while supposing the Restriction, won't we do quite a lot toward characterizing a Particulate World, and also a Plenumate World?

No; we won't. For, the situation is this: Whenever there's something that seems to characterize an experiencing creature as constituted of many Particles, there's also something, in correlative Plenumate terms, that seems to characterize that creature, with just as much propriety, as not being so constituted. Let me explain.

In an attempt to characterize an experiencing creature that features a body as well as a mind, with *Particulate* terms we may say this: Ever so many material Particles, perhaps billions and billions, serve to *constitute* the material creature with a mind. Or, at the very least, they all serve to constitute the body of the creature; and, because so many of this body's Particles are going through an appropriately complex sequence of arrangements, this body, it may then be said, subserves the creature's mind. When the duly constituted creature has experiences, Qualities are, through or in the creature's mind, instanced in the Particulate World.

But, using *Plenumate* terms, we can say *this* about any materially realized experiencing creature: Ever so many Bubbles in the Plenum, perhaps billions and billions, serve to *institute* the physical creature with a mind, to coin a euphonious Plenumate term. Or, at least they serve to institute the body of the creature, which body subserves the creature with a mind. When the duly instituted creature has experiences, Qualities are, through or in the creature's mind, instanced in the Plenumate World.

In this section, serious questions were raised about any attempt to contemplate physical reality within the confines of the Restriction. Initially, it may have appeared that each of my attempts to characterize physical reality, one with Particulate wording and one with the Plenumate terms, clearly contrasted with the other. But, mightn't it be that, I actually made just one extremely insubstantial start twice over, first using one mutually connected group of terms, the "Particulate

terms," and then using another, the "Plenumate terms"? Mightn't it be that, as long as any attempt to conceive of our world is limited by the Restriction, it will be doomed to futility?

6. When Limited by the Restriction, How to Conceive a Particle's Propensities?

In my two attempts at characterizing Worlds, I tried to attribute Spatiotemporal properties to the objects of the Worlds. For example, I said that, in one sort of World, there are spherical Particles and, in the other, there are spherical Bubbles. By contrast, I did little, or nothing, as regards the other basic natural properties of the intended objects, the Propensities and the Qualities. Of course, as the Restriction was fully in force, it was forbidden to attribute any Quality to a Particle, or to a Plenum. But, what about Propensities?

On this, we can hardly do better, I should think, than to consider what, historically, appears the propensity most saliently proposed for philosophical consideration, the supposed *solidity* of things material. And, on that, we can hardly do better than to begin with Book II, Chapter IV, of the *Essay*, which is "Of Solidity," where Locke aims to present an "Idea" that serves to distinguish material Bodies from the mere Space they may occupy:

That which thus hinders the approach of two Bodies, when they are moving one towards another, I call *Solidity*.but if any one think it better to call it *Impenetrability*, he has my Consent. This 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: the Mind, considers it, as well as Figure, in the minutest Particle of Matter, that can exist; and finds it inseparably inherent in Body, where-ever, or however modified.

This is the *Idea*, belongs to Body, whereby we conceive it *to fill space*.⁸

As with other passages, we should understand Locke here as assuming, if not affirming, that the Restriction holds. Even as Newton's physics ignores Qualities, Locke excludes them from the world's vast material realm, restricting them to our Minds. (*Essay*, 136-37)

For Locke, solidity is impenetrability. But, with the Restriction in force, what can such solidity do for our conception of a Particle? An excellent discussion of the question can be

⁸ In P. H. Nidditch's edition of John Locke's *An Essay concerning Human Understanding*, Oxford University Press, 1975, the quoted words can be found on page 123.

found in John Foster's terribly difficult book, but at least occasionally brilliant book, *The Case for Idealism*.⁹ According to Foster:

Locke ... thought that the nature of solidity is revealed in tactual experience. But in this Locke was clearly mistaken. ... The tactual experience of solidity is no more nor less than the experience of voluminous resistance, and, in so far as our concept of solidity is acquired through tactual experience, the specification of matter as solid is opaque. All it adds to the specification of matter as a voluminous substance is that there is *something* in its intrinsic nature (it does not say *what*) which makes material objects mutually obstructive. (page 63)

Now, I do not know that Foster is right in his suggestion that Locke thought that solidity was not a Power of material objects. More likely, it seems to me, in "Of Solidity" Locke was involved in muddles: How could *Impenetrability*, which Locke says is the very same as Solidity, *not* be a Power of resistance on the part of Impenetrable Bodies. But, philosophically, there's no more to be gained from Locke here than what Foster contends, nothing much at all. Indeed, insofar as Foster's reading of Locke may be mistaken, his error will be, apparently, *undue charity* toward the old philosopher.

At all events, where Foster is most helpful is in his own discussion of the quite general question of the "Powers of Material Bodies." This occurs in an appendix to chapter 4 of the book. As Foster's thinking there is so very helpful, I'll quote this appendix at length:

The only properties of fundamental particles which can be transparently specified in physical terms are (1) spatiotemporal properties, such as shape, size and velocity and (2) causal and dispositional properties, such as mutual obstructiveness, gravitational power and electric charge. From this, I have concluded that ... the intrinsic nature of the particles can, in physical terms, only be specified opaquely, as that on which their behavioural dispositions and causal powers are grounded. But, is this conclusion justified? An alternative would be to say that each particle is, in itself, no more than a mobile cluster of causal powers, there

⁹ John Foster, *The Case for Idealism*, Routledge & Kegan Paul, London, 1982. By contrast with the passages from it that I'll cite, much of the book is written in a very difficult technical style. From the parts I've managed to understand, I'm convinced that the work deserves serious study. A few of its last words convey the thrust of the courageous book: "I hope one day to ... make the case for mentalism irresistible. But until then, I must be content with a Defence of idealism in its anti-realist and phenomenalist forms."

With his paper, "The Succinct Case for Idealism," in H. Robinson (ed.), *Objections to Physicalism*, Oxford University Press, 1993, Foster gives an overview of the difficult work.

being no 'substantial' space-occupant which possesses the powers and on whose categorical nature the powers are grounded. Such a thesis has been endorsed, in different forms, by a number of distinguished scientists and philosophers. (Here, Foster has a note naming such intellectual heavyweights as Leibniz, Boscovich, Kant, Priestley and Faraday.) If it is coherent, this thesis certainly has some appeal.

But is the powers-thesis (PT) coherent? The main problem is that if all the fundamental particles are construed in this way, there seem to be no physical items in terms of whose behaviour the content of the powers could be specified, and consequently, it seems that, in the last analysis, there is nothing which the powers are powers to do. Let us begin with a concrete example. We will assume that the atoms are the only fundamental particles and that all atoms are of exactly the same type. Now each atom has a number of causal powers. It has a power of resistance, whereby any two atoms are mutually obstructive. It has a power of gravitational attraction, whereby, between any two atoms, there is a force of attraction inversely proportional to the square of their distance. And it has a number of other powers which we need not list. For PT to be true, it is necessary some subset of these powers constitutes the essential nature of an atom. Let us suppose, for simplicity, we select the power of resistance as the only (putatively) essential atomic power and leave the other powers to depend on the contingent laws of nature governing the behavior of atoms. Thus each atom is construed as a mobile sphere of impenetrability, the behavior and causal interaction of these spheres, apart from their mutual obstructiveness, being governed by additional laws. The problem arises when we ask: 'To what is a sphere of impenetrability impenetrable?' The answer is: 'To other atoms, i.e., to other spheres of impenetrability.' But this means that the specification of the content of the atom-constituting power is viciously regressive: each atom is a sphere of impenetrability to any other sphere of impenetrability to any other sphere of impenetrability... and so on *ad infinitum*. From which it follows that the notion of such a power is incoherent, since there is nothing which the power is a power to do.

The problem is not avoided if we include further powers in the essential nature of the atom. Thus we might take the atomic nature to combine a power of resistance with a power of attraction, so that each atom is constituted by a mobile sphere of impenetrability surrounded by a more extensive (perhaps infinitely extended) field of gravitational potential (the field being structured, in accordance with the inverse-square-law, around the centre of the sphere). We could then try to specify the content of the power of resistance in terms of the behavior of gravitational fields or specify the content of the power of attraction in terms of the behavior of spheres of impenetrability. But neither specification blocks the regress, since it merely specifies the content of one power in terms of another. The only way of avoiding the regress, it seems, is to construe at least one of the powers as a power to affect the behavior of some ... space occupant ... with an intrinsic nature independent of its causal powers and dispositions. But such occupants are just what PT excludes. (67-69)

My conclusion, therefore, is that the powers-thesis is incoherent. And consequently, I stand by my previous conclusion that, apart from their shape and size, the intrinsic nature of

the fundamental space-occupants (assuming there are occupants at all) cannot be empirically discovered or transparently specified in physical terms. (72)

Now, I'm not sure that the considerations Foster marshals show that the powers-thesis is so much as *incoherent*. But, it does seem clear that they show there to be grave difficulties, perhaps even insuperable, with the thought we can understand certain regions of space, or certain entities occupying the regions, to have just so many Spatiotemporal properties and Propensity properties without their having any Qualities at all.

To take full advantage of them, I'll conjoin Foster's ideas with some complementary considerations. Toward setting out these considerations, I'll quote from "Of the modern philosophy," a marvelous section of Hume's *Treatise*:

The idea of solidity is that of two objects, which being impell'd by the utmost force, cannot penetrate each other; but still maintain a separate and distinct existence. Solidity, therefore, is perfectly incomprehensible alone, and without the conception of some bodies, which are solid, and maintain this separate and distinct existence. Now what idea have we of these bodies? The ideas of colours, sounds, and other secondary qualities are excluded. The idea of motion depends on that of extension, and the idea of extension on that of solidity. 'Tis impossible, therefore, that the idea of solidity can depend on either of them. For that wou'd be to run in a circle, and make one idea depend on another, while at the same time the latter depends on the former. Our modern philosophy, therefore, leaves us no just nor satisfactory idea of solidity; nor consequently of matter.

Add to this, that, properly speaking, solidity or impenetrability is nothing, but an impossibility of annihilation, An impossibility of being annihilated cannot exist, and can never be conceived to exist, by itself; but necessarily requires some object or real existence, to which it may belong. Now the difficulty still remains, how to form an idea of this object or existence, without having recourse to the secondary and sensible qualities.¹⁰

Like Locke before him, we should now understand Hume as assuming the Restriction to hold. And, as these passages then serve to show, in fixing on solidity, or on *what's left of that notion*

¹⁰ David Hume, *A Treatise of Human Nature*, Book I, Part IV, Section IV. My copy of the *Treatise* is the P. H. Nidditch edition, based on L. A. Selby-Bigge's earlier edition, from the Oxford University Press, 1978. In this edition, the quoted words are on pages 228-29.

when the Restriction has been supposed, Locke found nothing to distinguish adequately between Particles of Matter and Bubbles in a material Plenum.

Now, right before the quote just displayed, there are these sentences:

The idea of extension is a compound idea; but as it is not compounded of an infinite number of parts or inferior ideas, it must at last resolve itself into such as are perfectly simple and indivisible. Those simple and indivisible parts, not being ideas of extension, must be non-entities, unless conceiv'd as colour'd or solid. Color is excluded from any real existence. The reality, therefore, of our idea of extension depends upon the reality of that of solidity, nor can the former be just while the latter is chimerical. Let us, then, lend our attention to the examination of the idea of solidity. (*Treatise*, 228)

As Hume's here suggesting, without phenomenal colors available, or any similarly helpful Qualities, we'll lack the resources for an adequate conception of something's being physically solid or impenetrable. As Hume also seems rightly to suggest, the same pertains to any other alleged physical Propensity. (Except that Locke fixed on solidity as his favorite, there's nothing very special about that candidate, as the passages from Foster can be seen to show.)

In light of what's been presented in this section, we may be able to make useful comments concerning the questions that, at the just previous section's end, arose for my attempts to characterize a Particulate World, and also a Plenumate World: Though it may have appeared that each of my attempts to characterize physical reality, one with Particulate wording and one with the Plenumate terms, clearly contrasted with the other, mightn't it be that I actually made just one extremely insubstantial start twice over, first using one mutually connected group of terms and then using another? Indeed, it may now be so plain that those questions have affirmative answers that the whole matter's no longer interesting.

What may still be interesting, I think, is to notice these further points: With those attempts, even my *very talk of particles* may have been badly misleading, as was my *talk of a plenum*. As I'm suggesting, it may be that something's *being a particle* isn't ever a completely NonQualitative matter, and the question of whether there's might not be wholly NonQualitative. With the *Restriction in place*, it may be that we're unable to think of a World as containing any *particles*; when supposing the Restriction to hold while trying to think of a "Particulate World,"

perhaps the most we can do is think, very abstractly indeed, about a physical World where "Quality-purged correlates of true particles" are to play a certain role in the history of the World. And, with the Restriction in place while trying to think of a "Plenumate World," perhaps the most we can do is think, just as abstractly, about a World where a "Quality-purged correlate of a true plenum" play a perfectly parallel role, or maybe even the very same role, in the history of the World. With thoughts so abstract, perhaps there's no significant difference between what we're thinking at the one time and at the other.

7. Extensible Qualities and Intelligible Propensities

With the Restriction in force and no Qualities available, we'll have no adequate conception of physical reality. By contrast, with Qualities having "real existence" in the physical realm, we may have a systematically rich variety of physical conceptions, perhaps far beyond anything imagined by Locke or Hume. Directly, I'll explain.

Whether or not we scientifically educated philosophers now can *believe* that any matter is a certain Qualitative color, say, that it's a certain Absolutely Specific shade of phenomenal red, it certainly seems that we can *conceive* there being matter, even perfectly insensate matter, that's entirely just such a red, and that has no other Absolutely Specific Quality. As I'll say, we're to contemplate matter that is *Red*.

It may also be helpful to have our considered stuff be, through-and-through, *pretty highly phenomenally transparent* (and *somewhat phenomenally translucent*.) As with any Quality our matter may have, it's (degree of) transparency must be Absolutely Specific. So, it's Red Transp-Taso matter that we're to conceive. For easy exposition, we'll call our matter just by its first name, Red.

Though it might not be believable for you and me, it's perfectly conceivable, even to us, that all of a World's matter be Red. In particular, it's conceivable that all of a World's matter be distributed so as to comprise eight Red congruent material spheres, each separated from the

others by Qualityless empty space, and with nothing else in such a region having any Qualities, whilst what's where any sphere is has just the color Quality we're contemplating.

Consonant with such a conception, there may be clear content in *each of several different ideas of impenetrability*. For just one salient way of cutting the conceptual pie, we may have clear content both in (i) the idea of a sphere that's impenetrable to, or by, *all* the matter that's external to it and in (ii) the idea of a sphere that's impenetrable to *some*, but *not all*, the matter external to it. In turn, I'll illustrate both ideas.

(i) We may think of an infinity of Red spheres each of which is absolutely impenetrable to every other, with the matter of these spheres comprising all the matter of the World in which there are the spheres. When two such spheres collide, then each directly recedes from the other, without either making any intrusion into the bounds of the other.

(ii) In addition to all our Red spheres, we may contemplate an infinity of spheres that are each an Absolutely Specific shade of phenomenal blue and a certain Absolutely Specific phenomenal transparency, an infinity of *Blue* spheres. Now, just as each Red sphere is completely impenetrable to all other Red spheres, each Blue sphere is impenetrable to all other Blue spheres. More interestingly, each *Red* sphere will be *perfectly penetrable* by any *Blue* sphere, and *vice versa*; so, without even the least resistance or temporal delay in trajectory, Red spheres and Blue spheres will pass through each other, as will parts of such Qualitatively different spheres. To conceive such a "perfect passing" most vividly, we may think of a region where a Blue and a Red sphere overlap as suffused with a certain Absolutely Specific transparent purple, as being *Purple* regions.

As this discussion of impenetrability suggests, any intelligible conception of physical Propensities, and any adequate conception of physical entities, has a central place for Extensible Qualities. At the same time, there's an abundance of such good conceptions that do that.

It's not surprising, then, to observe that, just as thought of Extensible Qualities allows us to have intelligible ideas of physical objects, variously distributed through space-time and disposed

toward various possible interactions, so it allows us to make intelligible specifications of Particulate Worlds, and clearly contrasting characterizations of Plenumate Worlds.

With attempts at Worldly characterization, we'll now have there be instanced some Extensible Quality *wherever there is matter*, from the minutest particle to a material expanse infinitely extensive in all directions. And, it's *only where* there's matter, or only where there's physical reality, that there'll be Extensible Quality instantiated.

In a Particulate World, there'll be Extensible Quality where, and only where, there are Particles, these being relatively small bounded regions of materially filled space, or spacetime. Each suffused with Extensible Quality, each particle is surrounded by a region that, as it's completely devoid of Quality, will also lack any real physical Propensity.

In a Perfectly Plenumate Physical World, Extensible Quality is instanced everywhere, and always, in the whole space (or spacetime) of the World. And, this Qualified space will be equally pervaded with physical Propensities; so, then, the World is filled with matter.

In a Plenumate World with Bubbles, finally, such well-Qualified materially filled space won't exhaust the space of the World. Rather, with each separated from the others by well-Qualified matter, there'll be many regions without Quality, and without anything of physical reality.

8. Intelligible Physical Reality and a Principle of Contingency

In terms of our three kinds of basic property, what's required for there to be a humanly intelligible mind-independent *physical* reality, whether or not it's the World's only realm of reality? Without much detail, I'll try to give the question a serviceable answer.

First, some words about some necessary relations: For a World to feature *physical* reality, it *must* include at least one entity such that (1) it has *some* Spatiotemporal Properties - even if it may be, in a quite extreme case, only the property of being, in all directions, infinitely extensive, and (2) it has *some* Extensible Qualities - even if it may be, in a quite extreme case, only the property of being, everywhere and always, the very same Quality, and also (3) it has *some* Propensities - even if it may be, in a quite extreme case, only the Propensity to exemplify, in

each place at each time, exactly the same Quality it exemplifies right there at the just previous time. The necessity just stressed is the same as with this more familiar proposition: As does any Euclidean geometrical closed solid, a physical entity precisely bounded by such a figure *must* be such that (1) it has *some* shape and also (2) it has *some* size.

As far as its being required of a physical entity that it instantiate some Extensible Quality, we need only recall the discussion of the previous section. As far as its being required that it instantiate some Spatiotemporal Property, we need only note that, for any thing to exemplify any Extensible Quality, there must be some space (or spacetime) that's occupied by that thing and suffused with that Quality. And, as far as its being required that our physical entity instantiate some Propensity, we've already observed the point to hold even in the extreme case of a physically homogeneous reality.

Second, some complementary words about some contingent relations: Even with regards to something that's a *physical* entity, there is *no necessary connection* between (1) *which* Spatiotemporal Properties the thing has, and (2) *which* Qualities the thing has, and (3) *which* Propensities are those of that physical thing. The *lack* of necessity just stressed, and the *contingency* just indicated, is the same as with this proposition: As is true of the Euclidean closed solid figures that precisely bound them, physical entities precisely bounded by such figures *may* be a certain given *shape* even while being *any* one of *numerous distinct sizes* and, equally, they *may* a certain given *size* even while being *any* one of *numerous distinct shapes*. As seems fitting, I'll call the proposition this paragraph aims to express, the *Principle of Contingency (of Relations among the Basic Properties.)*

For an easy appreciation of this Principle, recall the most recent remarks on characterizing Particulate and Plenumate Worlds. Perfectly in line with them all, for each of numerous Particulate Worlds, for example, there may be specified distinct exemplifications of Extensible Qualities. Even with a World specified as being "fully monochromatic" in Extensible Quality, there are numerous Particulate Worlds to countenance: Some are some Worlds where all the

Particles are Red; others have all Blue Particles, and so on. Equally, just as there are Plenumate Worlds where the Plenum is Red, there are others with a Blue Plenum, and so on.

For ease of exposition, we'll focus on Particulate Worlds, and we'll narrow the focus to Worlds whose Particles are like the Newtonian entities familiar from the quote from Foster. In these Worlds, each of enormously many Particles has the same "mass," the same "amount of matter," and each will attract the others with a force that varies inversely with the square of the distance between the centers of the interacting Particles. In some of these monochromatic Newtonian Worlds, all the Particles are Red; in others, all are Blue Particles, and so on. While that's old hat, we newly notice this: In *Tutti Frutti* Particulate Worlds, many Particles are Red and many others Blue, with yet many others being Yellow, and also Green, and Brown, and Grey, and Silvery, and Goldenish, and so on. (Along with such Qualitative variety, in many Tutti Frutti Worlds there's also much Qualitative stability; there, any Particle that's Red will always be Red, and it will never have any other Quality, not Blue, not Yellow, and so on.)

Our supposition of Tutti Frutti Worlds is as perfectly intelligible as its vividly imaginable. So, as I'll suggest, our Principle of Contingency may be both perfectly intelligible and entirely unobjectionable.

9. Qualities as a Factor in the Development of Physical Reality: A Problem

As it often appears, the Qualities of physical things won't be much of a factor in determining the development of any physical reality. The problematic appearance is most acute with physically well-behaved Worlds that, while otherwise heterogeneous, lack Qualitative variation, as with many monochromatic Worlds. What are we to make of this appearance? This question poses the *Problem of the Roles for Qualities (in Physical Reality)*.

Without thinking long and hard about the possible relations between physical entities and Qualities, there's little likelihood of encountering this Problem. So, as I expect, most contemporary philosophers will find this to be their first encounter with it. But, many may quickly come to appreciate the puzzle quite well.

To that purpose, we'll focus on the comparison between a monochromatic Newtonian World and, on the other hand, a Tutti Frutti Newtonian World. Except that the first has no Qualitative variety and the second has a great deal, the two Worlds may be exceedingly similar. So, the behavior of the Tutti Frutti World's Particles may precisely parallel the behavior of the Particles in the monochromatic World. And, then, all its Qualitative variety will make no difference to the physical development of the Tutti Frutti World. But, then, are there *any* Worlds where Qualitative variety means much more than that for the development of the World's physical reality? All too often, it seems there are none. So, our Problem often appears acute.

To appreciate this Problem properly, however, it's also important that we not overestimate the apparent predicament: Our Problem is *not* to show how it might be true that, in *every* World with physical reality, all the Qualities of physical things are very significant factors in the physical development of the World. Nor is it to show, even, how it might be that, in every such World, *at least some* such Qualities are such significant factors. Indeed, it follows from the Principle of Contingency (of Relations among the Basic Properties) that there's no more chance of doing such a thing than of drawing a perfectly round square. Rather than any of that, our Problem asks us to show how it might be that, in *some* Worlds with physical reality, some Qualities of physical things are quite significant factors in the development of that reality.

10. The Problem of the Roles for Qualities in Physical Reality: A Solution

At least since Galileo, physics has made great progress by ignoring, it appears, thoughts as to Qualities. Because we're so impressed by that, when we contemplate physical Propensities such thoughts are excluded from our consideration. For progress with the Problem of the Roles for Qualities, we must rectify this intellectually restrictive situation.

To that end, I'll first characterize a World whose salient Propensities we find it easy to take seriously. Using this *Size-Propensity* World as a model for further characterization, I'll then characterize various *Quality-Propensity* Worlds, whose quite different Propensities we can also

take seriously. When we fully acknowledge these Quality-directed Propensities, perhaps we'll have found a solution to our Problem.

First, we'll contemplate a monochromatic Particulate World: While all the World's Particles have the very same Extensible Quality, perhaps *Grey*, these spherical Particles come in ten different Sizes, with many Particles of each Size. As regards both its volume and its "amount of matter," each of the smallest Particles is one tenth as great as each of the largest Particles; each of the next smallest is two tenths as great as a largest Particle, and so on. Now, each Particle has the Propensity to attract each of the others, and to be attracted by each of the others, with a force that varies directly with its Size (and, say, inversely with the square of the distance between its center and the centers of the each of the other Particles.) It's easy enough to take seriously the thought that a World might work in that way.

Next, we'll contemplate a *multichromatic* Particulate World: While all this World's Particles have the very same Size, perhaps the Size of the smallest Particles in the foregoing monochromatic World, these spherical Particles come in ten different "Achromatic Colors," with many Particles of each such Color. The lightest Particles, each of them Snow White, each has one tenth "the amount of matter" as the darkest, each of which is Jet Black; each of the next lightest Particles, each of them Very Light Grey, is two-tenths as "massive" as the darkest, and so on. Here, each Particle has the Propensity to attract each of the others, and to be attracted by each of the others, with a force that varies directly with its *Qualitative Darkness* (and, say,

inversely with the square of the distance.) Though there might be *no good reason for it*, as I'll suggest, it may be quite hard to take seriously the thought that a World might work in *this* way.

To make progress on our Problem, we must overcome this difficulty. We must take seriously not only the thought that physical entities have Qualities, but also the thought that, at least in some Worlds, such entities have Propensities *with respect to Qualities*. In other words, we must adopt a *more inclusive mode of thinking* than the one that, apparently, proved so successful for Galileo and so many successors. For adopting such more inclusive thinking, what's most helpful, I imagine, is more experience with such thinking.

Accordingly, we may do well to contemplate a different contrasting pair of Particulate Worlds, again one a Size-Propensity World and the other a Quality-Propensity World. In both of these Worlds, there are four sorts of spherical Particles: Each exactly the same as the other in Quality, there are Large Red Particles and Small Red Particles, with former being ten times the Size of the latter. And, each of them having a Quality very different from that of any Red Particle, there are Large Blue Particles and Small Blue Particles, the former being exactly the same size as the Large Red Particles and the latter the same as the Small Red Particles.

Now, in the first of our two Worlds, each Particle will have a Propensity to attract any Particle that's different from it in Size, and a Propensity to repel any Particle that's the same Size. In this World, the Large Red Particles and the Large Blue Particles will repel each other, as will the Small Red and the Small Blue Particles. And, the Large Particles, both Red and Blue, will attract, and will be attracted by, the Small Particles, Red and Blue. As I'm envisioning this World, when Particles attract, or repel, other Particles, it's *because* the former have Propensities *with respect to the very Size* the latter possess.

In the second World, no Particle will have any of those Propensities. Rather, each will have a Propensity to attract any Particle that's different from it in *Quality*, and a Propensity to repel any Particle that's the same Quality. In this World, the Red Particles, Large and Small, will attract, and will be attracted by, the Blue Particles, Large and Small. Far from repelling each other, here the Large Red Particles and the Large Blue Particles will *attract* each other. As I'm envisioning

this other World, when Particles attract, or repel, other Particles, it's *because* the former have Propensities *with respect to the very Quality* the latter possess.

Toward gaining comfort with the good thought that, in addition to their having Qualities, many physical entities have Propensities *with respect to Qualities*, I've considered a couple of relevantly contrasting pairs of Particulate Worlds. While the job is a tad more complex, we can do as well with, say, apt pairs of Plenumate Worlds. But, even without actually encountering such a variety of illustrative examples, we see how the Qualities of physical entities can be a very significant factor in the development of physical reality.

11. Concluding and Continuing Questions

In comparison with most recent papers in philosophy, this one has been quite ambitious. But, it is not nearly so ambitious as might appear. So, it might sometimes seem that I have attempted an argument, very largely a priori, to the effect that, in this actual world, certain sorts of properties are basic properties, to wit, Spatiotemporals, Propensities, and Qualities. But, of course, it's futile for anyone to argue, in such an a priori fashion, to any such substantial effect. And, of course, I haven't really attempted anything like that much.

Much more modestly, I've argued only for conditional propositions. Conspicuous among them is this: If the scientific metaphysic provides us with a tolerably accurate understanding of this world, then, as basic properties instanced in the actual world, there are Spatiotemporal Properties, and Propensities, and also Qualities. As we should bear in mind, it *might* be that this dominant worldview provides us with no such thing.

When the limits of the present essay are appreciated, we see large questions for future inquiry. Salient among them is this: If the scientific metaphysic should be inadequate, then what might we best suppose are the basic properties of concrete reality? As a first pass at this fearful question, I hazard the conjecture that we should still countenance Qualities and Propensities, and perhaps Temporal Properties but no Spatial Properties.

In the present climate, I may be a greater friend of qualities than any other admittedly ambitious metaphysician. Yet, I have doubts about that. Now, especially as this essay is dedicated to Jerome Shaffer, for a most salient example of work that fuels these doubts it's especially fitting to consider work from a most salient student of Professor Shaffer's. So, I ask: What does David Lewis denote with "qualities" in this schematic metaphysical passage?

Many of the papers, here and in Volume I, seem to me in hindsight to fall into place within a prolonged campaign on behalf of the thesis I call "Humean supervenience." ...

Humean supervenience is named in honor of the greater denier of necessary connections. It is the doctrine that all there is to the world is a vast mosaic of local matters of particular fact, just one little thing and then another. (But it is no part of the thesis that these local matters are mental.) We have geometry: a system of external relations of spatio-temporal distance between points. Maybe points in spacetime itself, maybe point-sized bits of matter or aether or fields, maybe both. And at those points we have local qualities: perfectly natural intrinsic properties which need nothing bigger than a point at which to be instantiated. For short: we have an arrangement of qualities. And that is all. There is no difference without difference in the arrangement of qualities. All else supervenes on that.¹¹

Though Lewis clearly uses "qualities" for *some* metaphysically basic properties, it's not clear what these properties are. Are his qualities much like our Qualities?

Following Russell, who followed Hume, in characterizing the Qualities I wanted there to be *some* connection, however indirect and tenuous, between the properties targeted and what we might experience, if only with the experience enjoyed in imaginative understanding. Without *any* connection to *any* such aid to intelligibility, what are we humans to understand by *anyone's* metaphysical reference to qualities? So it is that, in trying to say *something intelligible about what are* Qualities, I referred us to phenomenal qualities. Anyway, as Lewis's qualities are absolutely basic in his metaphysics, it should be asked: In humanly intelligible terms, what's there to say as to *what are* these items on whose arrangement, perhaps, all else supervenes?

This paper serves also to raise questions about the work of other students of Shaffer's, including the work in this very paper itself: When I said that, if the Extensible Qualities don't

¹¹ David Lewis, "Introduction," *Philosophical Papers*, Volume II, Oxford University Press, 1986, *ix*.

include phenomenal colors, then they should be strongly and deeply analogous to such colors, what sort of analogy could I sensibly have had in mind? More specifically, *in what respects* are such Extensible Qualities to be so analogous to phenomenal colors?

The previous section's discussion promotes the appearance that, for an intelligible conception of the actual world as comprising a heterogeneous physical reality, we need only a very few Qualities, and these may bear very much the same relations to each other as obtain among a *very few achromatic* phenomenal colors, perhaps much as obtain between just a certain Light Grey, say, and a certain Dark Grey. So, perhaps we can do a fair amount to sharpen our questions, and even to place limits on the range of sensible answers: What is it about the relations among, or even between, a few colors that, at least to a quite significant degree, must find a parallel in relations among Extensible Qualities, if thinking in terms of these Qualities will do much toward our having an adequate conception of physical reality?

As I've just observed, there's been the appearance that an adequate conception of what seems most of our world requires us to conceive only a very few Qualities as basic properties, perhaps just two Extensible Qualities. But, that appearance might be illusory. To do justice to even just the Qualities apparently available in, or through, our immediate experience, perhaps we must regard as basic all the known phenomenal qualities, both such as seem Extensible and such as seem NonExtensible. Now, insofar as it may come to seem that the truth lies in such a more expansive vein, then, however restricted the academically respectable options of the time, serious philosophers will have to confront such extensive considerations as this final question: Might it possibly be that, rather than with the scientific metaphysic, only with a more mentalistic worldview, maybe one where neither the physical nor the mental is most basic, will we have anything like an adequate conception of what's actually concrete reality?

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