Space for psi: A philosophical perspective

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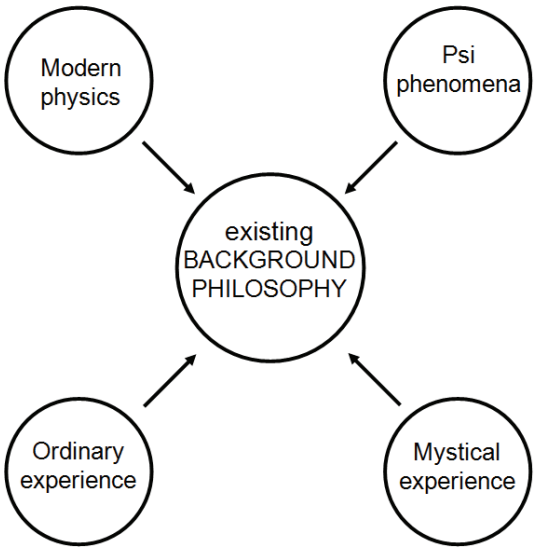
1. Introduction: Four Puzzles

Several kinds of phenomena challenge our commonsense beliefs about space and time, mind and matter, cause and effect. I'll begin by highlighting four of these. In the first place, parapsychology confronts us with the various *psi phenomena*: telepathy, clairvoyance, precognition, psychokinesis. It's hard to believe that we can read one another's minds or know about events that have yet to happen, except through conventional means, or that we can *directly* influence material objects other than our own material brains.



Another area of puzzlement, usually treated separately from psi phenomena but probably related to them, is *mystical experience*. Mystics sometimes report vastly expanded perceptions and cognitions of the world, and feel that they were in direct contact with the universe, intuiting its unity, interrelatedness, and harmony, and even the co-existence of past, present, and future. Again, mind seems to have greater access to the world than is normally considered possible, even to 'past' and 'future' ages.

Of course, the genuineness of both psi phenomena and mystical experiences has been strongly contested over the years and cannot be taken for granted, but there are some mainstream areas of puzzlement that may also incline us to review our basic concepts. One of these areas is modern physics. Einstein's special theory of relativity upsets classical notions of space and time, and what are we to make of the curved spacetime of general relativity or the extra space dimensions in recent attempts to unify physics? Quantum theory is also challenging, with its seemingly nonlocal interconnections and hints of 'backward causation', a type of cause and effect that works from later states to earlier states, from future to past, so to speak.

Psi phenomena, mystical experience, and modern physics are somewhat abstruse areas of concern, but there is also a source of puzzlement that lies closer to home, namely our *everyday experiences*. It is a mystery how material brains can support vivid, conscious life, rich in colours, sounds, flavours, emotions, meanings. However hard you look, you won't find the tang of a lemon, the 'felt quality' of consciousness, in the equations of physics or in the neurophysiology of the brain.

In summary, there are at least four areas of puzzlement that challenge some of our background ideas about the nature of the world. Together these ideas can be called a *background philosophy*, the metaphysical and epistemological ideas that guide our understanding of the world:

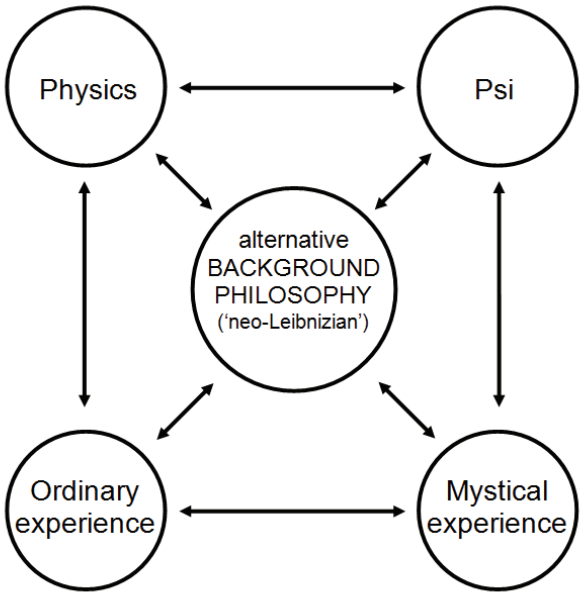
background philosophy: metaphysics and epistemology

nature of reality
change & permanence
space, time & matter
causality
mind–body relation
self & other
perception

In modern western society, the prevalent background philosophy owes a great deal to the so-called *corpuscular* or *mechanical philosophy* that emerged with the new science of motion in the seventeenth century, through the work of Galileo, Descartes, Newton, and others.

In this talk, I'm first going to say a few words about the mechanical philosophy and its legacy, specifically the Newtonian concepts of space and time, and the Cartesian dualism of mind and body. I'm then going to focus on one approach to the mind-body problem that

offers an alternative background philosophy in which our four areas of puzzlement become less puzzling and come together in a common framework. The approach in question is an idealist philosophy that in general form, if not in the details, dates from about the same period as the mechanical philosophy, being indebted to Newton's great rival, Leibniz. It was only in the twentieth century that physics began to catch up with this alternative world-picture.



I'm going to pay most attention to the physics side of things, and I apologise for this in advance, but I think that the evidence of physics will be particularly important for putting the old background philosophy to rest. Physics helps us establish an alternative background philosophy, and it is from this philosophy that genuine psi phenomena will be seen to emerge. I don't follow the more usual route of applying physics directly to psi phenomena to give a physical theory of psi. *Rather I look beneath the physics and the psi for a unifying philosophical framework.*

So, I've introduced the four puzzles. I'm now going to say a few words about the mechanical philosophy and its problematic legacy. Then I'll outline an alternative, idealist framework for modern physics. And finally, I'll comment on how mystical experience and psi phenomena fit into this framework.

2. The mechanical philosophy and its problematic legacy

In ancient Greece, just before the time of Plato, a special understanding of space, time, and matter began to take shape. In response to contemporary debates about the reality of change and permanence, Democritus and other thinkers asserted that the world consists of solid, indestructible atoms and the space or void in which the atoms move. Since everything consists of atoms and void, everything, including perception and mind, has to be understood in terms of contact and touch. The philosophy was subsequently eclipsed by Platonic and Aristotelian philosophies, but about two thousand years later, in the seventeenth century, it had an enormous impact when it joined forces with mathematical investigations of motion, culminating in Newton's mechanics.

The philosophy behind this new physics of motion was open to criticism on several counts, but I'll highlight just two of them. First, it treats space and time as real things, as independent substances, as entities that exist in themselves. Space is taken to be an extended nothingness that is everywhere the same, a stationary arena in which objects are either at rest or in motion. Time is also a sort of background, one against which things happen, flowing along at its own steady pace. If all the matter in the Newtonian universe were to disappear, extended space and flowing time would continue to exist. Leibniz took a very different view, asserting that there is no space and time apart from transforming things. Space and time are nothing but relations, relations of co-existence in the case of space, relations of succession in the case of time. If all matter disappeared in the Leibnizian relational universe, so too would space and time. The tension between the Newtonian *substance view* and the Leibnizian *relational view* remains to this day, and it is now further complicated by the replacement of space and time by spacetime. Is spacetime a real entity in itself, or is it nothing more than the spatiotemporal relations between events?

It is more than likely that the status of space and time will continue to be a mystery unless we sort out another contentious legacy of the seventeenth-century mechanical philosophy and its ancient Greek forerunner. The philosophy paints a very barren picture of the world. The world is said to be characterized by only qualities of extension and motion, the shapes, sizes, arrangements, velocities, and accelerations of bodies, and by a few other physical or chemical characteristics, such as mass, force, and energy. Crucially, the universe of space, time, and matter is said to have none of the so-called *phenomenal qualities*, the colours, sounds, odours, flavours, pleasures and pains, the qualities of consciousness, the *qualia*. And *'conscious mind'* has no place there either, no awareness, intentionality, knowing, meaning, emotion, or volition in the world at large. This exclusion

of phenomenal qualities and conscious mind has some important consequences. With mind excluded, the only conceivable type of causation is mechanical causation, that which proceeds from one moment to the next through the contact of material particles or the action of forces between the particles. And the only permitted means of acquiring knowledge is through mechanical stimulation of the sense organs. Knowledge of the world must come through the senses.

Physics has, of course, changed a great deal since the seventeenth century, but aspects of the old philosophy continue to exert an influence. It is still easy to be shocked by hints of non-standard causal connections, whether in the data of quantum physics or parapsychology. And very importantly, there is still no suggestion in mainstream science that the world of space, time, and matter has any phenomenal qualities in itself or any features of 'mind'. There is still no place for mind in the world at large, and there is still the common assumption that knowledge must ultimately derive from the senses. The possibility of access to the world through extra-sensory channels is generally viewed with great suspicion.

The mind–body problem

The exclusion of phenomenal qualities and conscious mind raises an obvious question. What is the relation between the comparatively barren world of space, time, and matter and our rich mental lives? In the seventeenth century, Descartes gave one influential answer in his *dualist* philosophy. Taking on board the barren picture of the material world, he supposed that matter and mind are almost completely distinct substances. Yes, both transform in time, but whereas matter is pure extension, mind is unextended and incorporeal. The two were supposed to interact at a site in the brains of human beings, but it was not at all clear how two things as different as mindless matter and immaterial mind could interact with each other. Descartes' severe dualism brought the *mind–body problem* into sharp focus, a problem that has attracted a variety of responses over the last three hundred and fifty years. One option is to retain the dualist distinction between minds and the material world but modify the Cartesian picture in some way that hopefully makes the dualism less problematic.

Another option is to reject dualism all together. For instance, *material monists* claim that there is really nothing but the material realm. They either eliminate consciousness from existence or reduce it to matter, identifying conscious mental states with physical brain states. It's difficult to take these materialist positions seriously if one is a conscious

being oneself. The fact of experience, of consciousness, of 'what's it like to taste the lemon', is indubitable.

More promising are those monisms that go in the other direction and question the matter component of mind–matter dualism. Perhaps the seventeenth-century mechanical philosophers were in error when they set up an external world of space, time, and matter devoid of phenomenal qualities and conscious mind. The mechanistic focus on readily quantifiable things, on geometry and motion, was certainly a very productive research strategy, but perhaps the mechanists went too far when they conceived of the world at large in terms of geometry and motion alone. The error of dualism and materialism, then, if indeed they are in error, is to take the material picture of the world too seriously. If, in contrast, we take the world at large to be like our phenomenal experiences in significant ways, there will be a closer connection between the two and perhaps the mind–body problem will evaporate.

There are several ways in which monists can do this, but the most thoroughgoing critique of the material world-picture comes from *idealist monism*.

3. An Idealist Framework for Modern Physics

For metaphysical idealists, mind is fundamental, and the world exists as the contents of mind in some way or other. The mind–body problem is eased because there is no longer a sharp division between two distinct domains. Instead, everything is to be understood in terms of mind. Talk of space, time, and matter is really abstract talk about extensions, transformations, and structures in a field of experience, in the experiences of our own personal minds and, more importantly, in the experience of inclusive, global mind behind our personal minds. Space, time, and matter can still be considered real but not as things independent of mind and its contents.

This is all rather vague, of course, but we can turn to some classic idealist philosophies to find out how the metaphysics can be worked out in detail. We could, for instance, turn to Bishop Berkeley's idealism, but this isn't very friendly towards matter and has a contrived theory of perception (see Note 1). Rather, I have found Leibniz's philosophy of monads to be a useful starting point for understanding matter. I'm not saying that his monadology provides a complete theory of matter. It is after all a seventeenth-century philosophy set in the context of seventeenth-century science. But it does provide a general approach that can usefully engage with contemporary physics.

Leibniz supposed that the world consists of *unitary minds* or *monads*. A basic feature of the monad is its perception, which expresses the universe from a particular spatiotemporal point-of-view, in fact, from a sequence of points-of-view as the monad develops. Each monad is a self-developing whole whose sequence of perceptual states exhibits the development of the entire universe. Monads are therefore identical with one another in so far as they have the same universe as their experiential contents, but they are also different from one another because they express the universe from their own vantage points and with different degrees of 'distinctness' or 'clarity'. For the majority of monads, only the monad's immediate body is represented clearly. Thus, although monadic minds have the entire universe as their perceptual contents, much of the perception is very indistinct.

Now an important aspect of the philosophy of monads is its special take on the atomic theory of matter. For Leibniz, the 'true atoms of nature' are not the material atoms of the mechanical philosophy but the monads themselves. If we were particularly clear-perceiving monads and were able to inspect the composition of extended bodies at the smallest scales in our cosmic perceptions, we would find that the bodies are aggregates of other monads. Or, to put it more accurately, the basic units that go to make up extended bodies in one monad's perceptions are representations of other monads. Matter is the perceptual expression in one monad of groups of other monads. The idealism is therefore of the *panpsychic* type, with the basic constituents of objects having a mind-like nature.

Without empirical support, Leibniz's monadology is all too easily dismissed as extravagantly fanciful metaphysical speculation. But strangely, in the twentieth century, scientific observations began to probe sufficiently deep into the structure of the world to suggest that the Leibnizian picture may have some relevance after all. Monadology, with its multiple, perspectival versions of the same universe, has resonances with the special theory of relativity, which has multiple inertial frames of reference in which the same laws of physics hold (Einstein's *Relativity Postulate*). This is just what one would expect for monads: they all express the *same* universe from their centres of perception, and therefore they all exhibit the *same* physics, including the same physics of electromagnetism, and therefore the same electromagnetic radiation velocity, the invariant velocity of light (Einstein's *Light Postulate*). Furthermore, the theory of monads, a theory of relative versions of the world, has no difficulty accommodating the peculiar effects that follow from the common light velocity, such as the relativity of distance and time interval measurements between the same events for observers in relative motion. This relativity of distance and time doesn't make sense if there is just one absolute state of the spatiotemporal world. But in the monadic picture, there is no single, universe-wide space

and time, no single cosmic state, just the relative, experiential perspectives of monads and their transformations that define their own local times.

Now it's a funny thing that if we try to understand relativistic physics in terms of monads, we are led naturally towards quantum physics. How does this come about? Well, the monadic picture of matter is thoroughly holistic. It's a holistic atomism. Everything is interconnected spatially and temporally since each is a complete whole. The monadic elementary particles are intimately connected with one another and with the whole universe because they are representations of the universe. By embodying the universe, each particle is sensitive to events throughout the cosmos, even to future events if the cosmos is a spatiotemporal whole, the block universe that includes past, present, and future events, as some interpreters of relativity theory have supposed.

In what sense is the universe present to each monadic particle of matter? It is not too clear (to me) how Leibniz understood the representation of monads within one monad. Perhaps they are just represented as dimensionless points. But whatever Leibniz intended, we can take the representations to be true to the experiences they represent, so that they are not mere points but precise copies. Hence, as representations of the universe, the monadic atoms would have internal contents, including the full, extended contents of the universe. In Leibniz's day, it would have been difficult to see how this could be so, but nowadays, with the development of non-Euclidean geometries and general relativity, it's not nearly so difficult.

So let's translate monadology into modern physical terms. For illustrative purposes, let's say that the universe is a four-dimensional spacetime that expands from a Big Bang and eventually contracts to a Big Crunch, giving it a spherical shape. Recent data has favoured a universe that keeps on going with accelerated expansion, and so sphericity is not at present the preferred candidate for overall shape, but it's nonetheless useful for illustrative purposes and can't be entirely ruled out.

With a spherical universe, then, the monad's cosmic perception is the four-dimensional spacetime surface of a five-dimensional hypersphere, or perhaps the hypersphere itself. But what about matter in this spacetime universe? Well, the elementary particles in a monadic universe are simply representations of the universe. Hence, the basic particles on the 4-dimensional surface are themselves 4-dimensional surfaces of 5-dimensional hyperspheres.

There are some observations to make about this setup:

1. The universe no longer consists of two distinct substances, spacetime and matter, since matter itself consists of spacetime. Of course, in the idealist framework, spacetime is not a basic entity either. Nor is it purely relational. It's a feature of the monad's

experiential field, an experiential expanse characterized by some qualities of consciousness, such as colour qualities. Spacetime would be a variegated, luminous expanse.

2. The total dimensionality of the universe has increased because in addition to the four large dimensions of spacetime, there are now the four compact dimensions of the monadic atoms. The dimensionality of the universe has doubled from four to eight, or perhaps from five to nine or ten, depending on exactly how one understands the embedding of the monads. For instance, if we naively add together the five dimensions of the cosmic hypersphere and the five dimensions of their atomic representations we get ten.
3. This picture of spacetime dimensionality departs from most current superstring theories, which have ten or eleven dimensions of which only one is a time dimension, the everyday time dimension. [F-theory has two time dimensions among its twelve dimensions, but it hasn't been clear to theorists what this extra time dimension might be.] The monadological world-picture gives us, at first approximation, two time dimensions. The first of these is the familiar large time dimension of the cosmos, and the second is the embedded time dimension of the monadic particles. The second time dimension isn't a new one: it's just a small-scale representation of the large one.
4. The dimensionality of the universe does not stop here because the monadic atoms are spacetime universes, and as spacetime universes they have their own monadic atoms, and so on *ad infinitum*. As a result, the dimensionality of the universe consists of nested sets of dimensions at ever-decreasing scales, nested sets of four dimensions, three of space and one of time. Or again, if we naively add hypersphere to hypersphere, the overall dimensionality consists of multiples of five.
5. It's possible that the dimensionality is even more elaborate if the nesting of dimensions proceeds not only in a descending fashion to smaller and smaller scales but also in an ascending fashion to larger and larger scales. I won't elaborate on this possibility because I've probably confused you enough already, but it's worth mentioning because it has interesting implications for current physical speculations in which the universe is a surface or membrane floating in higher dimensional space, a *brane* or *braneword* floating in the so-called *bulk*. For one thing, it would mean that the physics of the braneworld in the bulk is exactly the same as the physics of the basic particle in its surroundings. Understand one, you understand the other. (See Note 2.)

What I want to emphasize is that quantum physics emerges naturally from this world-picture. Because the fundamental particles perceptually contain within themselves the

entire universe they are in effect instantaneously and intrinsically sensitive to everything in the universe, without any communications from outside. There's no need for faster-than-light signalling. And because the fundamental particles are spacetime wholes, containing a time dimension, they are sensitive to events in the future, to their own later states and to later events in general. The paths that particles take depend not only on earlier events but on later events too.

Now it's interesting that this kind of thinking – influence of 'future' events on 'past' ones – is to be found in some modern interpretations of quantum physics, and here I'll mention one example, a highly speculative theory put forward not so long ago by the physicist Mark Hadley, a theory that carries forward an idea that Einstein himself worked on. Whereas most physicists try to produce a quantum theory of gravity, the reverse approach is to put the general theory of relativity first and hope that quantum theory will follow. This is done by treating elementary particles as solutions to the equations of general relativity. In other words, elementary particles are localized distortions of space or spacetime, like tiny black holes. But whereas previous theorists tended to treat these particles (*geons*) as bits of warped space, Hadley thinks it makes sense to treat the particles as bits of warped spacetime. Thus, time enters into the composition of the basic particle, and it is from this time component that backward causation, quantum uncertainty, and quantum theory in general are said to follow. In Hadley's theory, the time component consists of a time loop, like a wormhole, which allows the particles to be affected by as yet unknown events in the future. Particle behaviour is therefore not completely determined by past states. There is a contribution from the future.

Although Hadley's approach is not grounded in metaphysics, it does have interesting parallels with the monadological approach I have suggested. Both make general relativity fundamental by treating particles as spacetime structures and hope to derive quantum physics from the presence of past, present, and future in the particles. Hadley's theory is therefore of considerable interest: it describes how in principle quantum effects may follow from particles that are sensitive to the future. The monadological picture, in turn, puts Hadley's theory and its forerunners in metaphysical perspective, providing a framework from which relativistic physics, extra spacetime dimensions, and even quantum physics seem to emerge with great naturalness.

4. Mystical experience and psi phenomena

This is all very speculative, of course, and I've said enough about physics. It's time to move on to our remaining areas of puzzlement, mystical experience and psi phenomena. It's not difficult to appreciate that monadology, with its concept of perceptions that express the entire universe, could be used to shed light on expansive mystical experiences, on episodes of cosmic consciousness. However, Leibniz's monadology, as it stands, has limitations in this respect because it attributes very indistinct perceptions of the cosmos to human beings. In the long-term evolutionary development of species up the chain of being, we can acquire more distinct perceptions of the cosmos, but this doesn't explain why we, in our human bodies, sometimes have expansive mystical perceptions. I don't think we should worry too much about this apparent difficulty. It is possible to modify Leibnizian monadology without too much effort so that even the confused perceptions of human beings can sometimes give way to vastly expanded experiences of the world.

There are some hints of monadic perception in the world's mystical literature, both ancient and modern. One of the most elaborate examples is the cosmic visionary experience portrayed in the Indian Buddhist *Flower Ornament Scripture*, a collection of texts composed a little under two thousand years ago. When advanced practitioners enter certain concentrative states, they experience the world as the omniscient Buddha experiences it, as the Realm of Reality (*dharmadhatu*). In these concentrative states, the smallest particle is found to contain innumerable lands, all the worlds, all the universes. Likewise, the briefest moment of time is found to contain past, present, and future. In fact, all times and all places are observed in every particle. There, advanced meditators witness the formation, evolution, and destruction of all the world systems, past, present, and future. If that were not enough, they also find that the innumerable worlds within the tiny particles are themselves made of the tiny particles.

This sounds very much like the monadically organized universe of the kind I've suggested, with representations of the universe as the basic particles of the system, and therefore with descending sets of dimensions. The vision of the world in a 'speck of dust' or a 'grain of sand' sounds incredible to sense-bound beings who have no experience of deep concentrative states, as the authors of the *Flower Ornament Scripture* appreciated, but we can understand that the 'worlds within worlds' structure of the universe simply follows from a principle of mutual representation: my total experience includes your total experience, and your total experience includes my total experience.

What about paranormal phenomena or more specifically psi phenomena? Again, it's not difficult to see that a monadic universe could be a natural habitat for telepathy, clairvoyance, and precognition. Monadic minds have total perceptions, even if the perceptions are largely unconscious for the majority of monads. H. H. Price, the Oxford philosopher and one-time President of the Society for Psychical Research, remarked that 'Of all the great classical philosophers, I sometimes think that Leibniz is the one whose ideas are most suggestive for the Psychical Researcher' ['Paranormal Cognition and Symbolism']. Price observed that Leibniz gave us the 'strange and exciting idea of latent omniscience': minds know all the empirical facts there are to know, but the greater part of the knowledge is unconscious.

The concept of latent omniscience is a step towards understanding psi phenomena. It's an important step because it makes genuine paranormal cognitions, even cognitions of the future, possible in principle. Knowledge of the world doesn't have to come exclusively through the senses because the world exists as the deeper perceptual contents of minds. There are two sources of knowledge, from the senses and from the deeper level of mind, and the latter source forms the basis of paranormal cognitions.

However, there are several challenges to be met, further steps to be taken. We would have to explain how and why the paranormal cognitions are ordinarily unavailable. As Price put it, this sort of theory makes us ask, 'Why does paranormal cognition occur so seldom?' Why is our omniscience so latent, so infrequently revealed? The 'why' is fairly easy to answer: it has often been pointed out, by Price and many others, that it would be extremely disorientating and disturbing if we were bombarded by paranormal cognitions. An occasional one could be useful, but a persistent leakage or a flood would most likely inhibit our ability to function in everyday circumstances.

The 'how' is more difficult to answer. What obstructs awareness of our mental depths, and what are the changes that sometimes allow access to the depths? By what means are specific cognitions selected from the vast pool of latent omniscience? Paranormal cognitions are specific, focused on particular events, and so there must be some way of extracting specific contents from the pool. Presumably, mediating processes operate between the global level of mind and the more superficial levels. As Price observed, the activity of these processes also shows in the errors and disguises found in paranormal cognitions. The cognitions are not always entirely accurate, and they are sometimes symbolic rather than literal, like dream imagery, and require interpretation. Errors and disguises can be explained if there are mediating processes that select and package material for inclusion in consciousness, for it is during the operation of these processes that errors and disguises can creep in.

What about psychokinesis, or 'mind over matter', a psi phenomenon that seems rather different from telepathy, clairvoyance, and precognition? The latter are paranormal cognitions and so in principle are traceable to the all-inclusive knowledge of a monadic mind. Psychokinesis seems rather different, being a paranormal action rather than a paranormal cognition, the action of mind upon material bodies. If psychokinetic phenomena are genuine, how can they be understood in a monadological framework? Well, 'mind–matter interaction' in the framework is simply 'mind–mind interaction', since matter is nothing other than mind, the representation of minds within a mind. It's possible, then, that psychokinesis is not really distinct from telepathy, clairvoyance, and precognition, having its basis too in the latent omniscience of minds. It's possible that when you have a powerful, conscious or unconscious intent or desire to alter the state of some object, the basic components of the object, the monadic minds, have some sense of your intent, perhaps at only a very unconscious level, and respond to that intent. To put it in parapsychological terms, there is telepathic communication between the mind that wills and the minds in inorganic and organic systems that respond. Psychokinesis works by telepathy and even precognition: material objects have some sense of your intents, even future intents. More generally, psychokinesis can be taken to reflect the mind-guided character of the world.

Thus, in a proper treatment of the subject, we'd have to look closely at the nature of causality in an idealist universe. Here mental causation, with its desires, volitions, purposeful striving, guiding ideas, plans, and goals, is not confined to a few higher organisms but runs through the world. The peculiar mind–matter connections suggested by psychokinetic and synchronistic phenomena are far more plausible in an idealist universe than in a purely material one in which only mechanical causation operates.

5. Conclusion

I began this talk by highlighting four areas of puzzlement that challenge commonsense notions of space and time, mind and matter, cause and effect. One of these areas is our everyday experience. How can we reconcile our rich conscious lives with the barren picture of the world inherited from seventeenth-century mechanical philosophy? My response was to reject the old world-picture and take up a form of idealism that pays proper attention to matter. This turned out to be a productive move. Relativistic and quantum physics seem to emerge naturally from the metaphysics, as indeed do some mystical and paranormal phenomena. The framework has considerable subsumptive power,

bringing together several areas in a common framework. It not only reconciles mind and matter but also brings together relativistic and quantum physics, which is no mean feat. As a bonus, genuine psi and mystical phenomena pop out of the metaphysics as real possibilities. The framework has promise, but of course it may turn out to be just another theory destined for the scrapheap. Still, it is a good theory in that it can probably be tested, for it is open to mathematical modelling and leads to predictions about the dimensionality of the world. It need not remain an intriguing but untested speculation.

Note 1: Comments on Berkeley's idealism

In Bishop Berkeley's idealism, the world consists solely of minds and their ideas. There are the finite minds, such as yours and mine, and there is the divine mind that feeds the finite minds with their perceptual contents. I don't find Berkeley's account of perception attractive because it makes our nervous systems, including sense organs and brains, somewhat redundant in the perceptual process. For Berkeley, the contents, orderliness, and coherence of our perceptions are a product of the will and activity of God. For instance, when we see a tree, God is directly impressing visual impressions of the tree in our finite minds, *as if* we were seeing the tree with our eyes and brains. But in fact the sense organs and nervous systems play no direct role in the proceedings. It's also unclear how Berkeley envisaged the contents of the divine mind. Sometimes, it seems that Berkeley accepts that the tree and the rest of the universe have a real noumenal existence in the mind of God (*mentalistic realism*). At other time, it seems that he does not (*mentalistic reductionism*).

Now, in putting forward a form of idealism that I think is well suited to make sense of our four areas of puzzlement, I make some significant modifications to Berkeley's idealism. First of all, I unequivocally accept that the universe of objects and processes investigated by physical science – including galaxies, stars, planets, rocks, bodies, brains, sense organs, molecules, atoms, sub-atomic particles – really does exist in Big Mind. Dualisms and materialisms, of course, take this universe of objects to be purely material, but this form of idealism takes them to be the contents of mind, the contents of Big Mind, or the 'mind of God' if you want to take a

theological line. So far the picture is not very different from Berkeley's understanding in his more realist moments.

However, unlike Berkeley, I do not want to invoke God's action as the cause of our perceptual experiences of the world. It doesn't really explain anything. So let's say instead that the finite minds or 'Little Minds' are not actually distinct from Big Mind but are part of it, and that a straightforward *representative theory of perception* explains our perceptual experiences. Let's consider the visual perception of a tree again. The noumenal tree, like our bodies, sense organs, brains and the rest of the universe, exists as a content of Big Mind. The phenomenal representations of the noumenal tree arise in our Little Minds in the following way. The surface of the noumenal tree reflects some light radiation. This is picked up by our eyes, resulting in nerve signals sent to the brain. All of this is taking place in Big Mind's field of noumenal experience: the tree, the light radiation, the sense organs, the nervous system, the brain are all noumenal contents of the experiential universe. Finally, through complex processing of signals, a phenomenal experience of the tree is constructed by the noumenal brain. The extended noumenal tree is now represented as an extended tree-shape in phenomenal experience.

The mind–body problem is eased because there are no longer two very different realms of mind and matter. Now there is just one experiential universe that contains two types of experience, noumenal and phenomenal. Phenomenal experience is just a special development of noumenal experience put together by the noumenal brains of organisms.

Note 2: Monadic constraints on the brane-bulk

If there are other universes floating in the bulk, they could simply be monadic representations of our own universe, not completely novel universes with their own laws of physics, as some theorists have suggested. Furthermore, the geometry of the bulk would simply be the geometry of our spacetime universe, because the bulk in which the universe floats is just a very large-scale representation of our universe. It's also the case that the physics that describes the gravitational interaction of our brane-universe with the bulk, a warping of the bulk in the immediate vicinity of the brane, would also apply to the basic particles within our universe. Gravitational

leakage and bulk warping wouldn't just be a feature of the cosmic brane and the bulk in which it floats. It would also be a feature of the basic particles within the brane, since these particles are cosmic branes too, but on a much smaller scale. In a monadological scheme, the physics of the cosmos is also the physics of the fundamental particle. As above, so below.