THE ELEVENTH ANNUAL ROMANELL LECTURE ON PHILOSOPHICAL NATURALISM

A NATURALIST PROGRAM: EPISTEMOLOGY AND ONTOLOGY

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Naturalism, I suppose, is generally thought of by philosophers as an *epistemic* program. It is the idea that the most reliable of our beliefs are got by experience, by observation and, if our naturalism is scientifically based, especially by those particularly sophisticated forms of observation that are called experiments.

My interest has always been in ontology, in what there is, rather than in epistemology. I first became fully aware of this bias when, quite a time ago, I worked on an epistemological book *Belief, Truth and Knowledge*. What really interested me, I came to realize, was what knowledge *is*, what truth *is*, what belief *is*. My interest in questions about what things, if anything, we really know, and what things we ought to believe, was secondary. My earlier work on perception, I further realized, had the same ontological bias.

For this reason, when I think about Naturalism I find myself most interested in an ontological thesis, a thesis that is an obvious enough companion of epistemic naturalism, but which seems not to be its necessary or even its invariable companion. This is the thesis, a thesis that I uphold, that the world, the totality of being, all there is, is the spatiotemporal system.

1. EPISTEMICS

Nevertheless, I suppose that one ought to start a lecture on Naturalism with some epistemology, with some normative epistemology. I submit the following proposals for our proper *epistemic base*. I am particularly concerned with delineating the areas where we can fairly claim to have *knowledge*.

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The first area that I call attention to I call Moorean knowledge, in homage, of course, to G. E. Moore's defence of what he called 'commonsense'. The latter term is not entirely happy, because some of the things that have been accounted commonsense have turned out to be erroneous, and present-day commonsense may contain its quota of errors. But it seems to me that there is an inner core of our beliefs which we cannot deny to be cases of knowledge without falling into irrationality in some very strong sense.

Some of this knowledge extends to no more than one individual. Persons who at a certain time are not observed by any other person or animal will very likely have a great deal of knowledge about their own physical and mental state at that time, knowledge that nobody else has. Consider the things that they will believe about the current state of their body and limbs, about their current state of mind, and about their current environment. Many of these beliefs will be knowledge, and a substantial subset of these will be knowledge of a Moorean type. Notice that I have not put current *mental* state in any special epistemic position. That I am sitting now is as much Moorean knowledge (for me) as that I am now thinking that I am sitting now. No doubt it is a metaphysical possibility that I only think that I am sitting now, but equally, I would argue, it is a metaphysical possibility that I only think that I am now thinking that I am sitting now.

A great deal of Moorean knowledge, however, is not confined to an individual or to the here and now. Very importantly, much Moorean knowledge is mutual knowledge, mutual among a narrower or wider circle. It is, for instance, Moorean and mutual knowledge among gatherings of contemporary philosophers at conferences that airplanes exist, that they did not exist before this present century, and that during this century they have mightily increased in safety, range, speed, and carrying capacity. A mark of mutual Moorean knowledge, incidentally, is that it is characteristically a bit embarrassing, a bit ridiculous, to call attention to instances of it. It is also characteristically somewhat vague and imprecise. Indeed, its certainty is to a degree bound up with this vagueness and imprecision. The certainty is purchased at the cost of the imprecision. Consider our knowledge that the sun rises at the end of each night. The word 'rising' suggests a bad theory, a theory which mankind long embraced. But it has since time immemorial been Moorean knowledge among human beings that this phenomenon we call 'the sun rising' is of regular occurrence.

Why should we accept that what I am calling Moorean knowledge really is *knowledge*? Perhaps the first and most important point is that we do accept that it is knowledge! "Nature, by an absolute and uncontrollable necessity has determined us to judge as well as to breathe and

feel," wrote Hume.[1] But I think that we can do a little better than this in the way of argument, and that Moore himself gave us the argument. Given that we are, in any case, going to accept that Moorean beliefs are knowledge, we can point out to sceptics (normally *pretending* sceptics) that if we are going to give them any countenance, then they must offer us *reasons* for thinking that these beliefs are not, or may not be, knowledge. But then, as Moore pointed out, it will be indefinitely more likely, *a priori* as it were, that there is some flaw in the sceptic's argument rather than it being reasonable to accept the sceptical conclusion.

It is a very fundamental part of the Moorean corpus that there is motion. Things move. Perhaps we have still not, after two and a half thousand years, got to the full bottom of Zeno's brilliant arguments against the existence of motion. What motion is in its deep essence may be a mystery, and fully answering Zeno may be one part of the resolving of that mystery. (Though I myself would look to science for major illumination.) But certainly Zeno should not persuade us that things do not move. Neither should anybody else.

Our Moorean knowledge is our true and proper epistemic base. Without it, we have nothing. With it, we may be able, indeed have been able, to advance beyond it to much further knowledge that is not Moorean.

What further knowledge have we got? My contention is, and this I take to be an important plank of Naturalism, that the only further knowledge that we have, or at least the only further knowledge that we have good grounds for thinking that we have, is to be found in the sciences. I use the term 'the sciences' here in an inclusive way. I include mathematics and logic as well as the natural sciences, and include under the latter phrase the historical and geographical studies, with history and geography taken as widely as they are taken in astronomy and cosmology. Philosophy, I think, and this is a point that I will return to later, contains no *knowledge* at all, or at least a vanishingly small amount. The same, I maintain, holds for religion, or rather the religions, an important though negative contention that, I suppose, any Naturalist is committed to.

When considering the sciences as a source of knowledge it is very important to distinguish between the better established and the more speculative parts of the various enterprises of science. One of the sceptical themes that we often encounter in contemporary culture is a line of argument that starts from the overthrow of the Newtonian paradigm by Einstein who replaced it with special relativity and then with general relativity. But, it is then pointed out, general relativity does not have the authority the Newtonian principles had in their day—some

cosmologists and physicists have looked for alternative frameworks—and even special relativity may stand in need of some modification. Given this perspective, it is then suggested, how can we credit physicists and cosmologists with really *knowing* anything? Rational belief, perhaps, more rational than any previous speculation even, but knowledge is putting the matter too high.

Such an argument strikes me as quite ill-conceived. People who put up this sort of argument are looking at the wrong cases. The fundamental principles of physics and cosmology are not at present the right areas to look to for knowledge. (Perhaps they will never be the right areas. Who knows?) These areas, in the present at least, are at the frontiers of science. They are, so to speak, in the Wild West, where the action is. The place to look for knowledge is in the settled and civilized territory far behind the line of the frontier. Innumerable examples can be given, especially by people who, unlike myself, actually have a good grip on some particular science. I will take an example familiar even to us philosophers. The stuff water is made up of molecules, and these molecules are made up of just three atoms, two atoms of hydrogen and one of oxygen. I assert, against some philosophers and crazies—ratbags as we say in Australia—that this is *known*. Quibbles can be made, but no serious epistemic assault can be made on this piece of knowledge. Even if we do not clearly know what molecules and atoms are (though I think in fact we have a good deal of knowledge about them), we know that water is made up of molecules having these atomic constituents. And one of the great and wonderful facts of the last four hundred years or so is that knowledge of this sort is steadily, indeed exponentially, increasing.

I included mathematics and logic among the sciences. There knowledge is quite certainly increasing. New theorems are proved every day, even if not all of these theorems are of the same importance and interest as Fermat's Last theorem, whose proof was the most recent public advance in mathematics. But unlike a number of philosophers who would, I suppose, count themselves naturalists of some sort—Quine is one example—I maintain that mathematics and logic are *a priori* sciences, rational sciences, sciences that deal in *proof*, with the propositions proved being necessary truths. This marks off these disciplines from the natural sciences.

There is, of course, a great deal of mathematics, and a certain amount of logic, involved in the natural sciences. To idealize a bit: starting from certain sets of propositions, some of which will be hypotheses having various degrees of credibility, then deductions are made from one or more of these propositions. Assuming that the deductions

are known to be correct—and such knowledge is often, if not always, achievable, even though there can be no absolute guarantee of correctness—then from the standpoint of mathematics and logic there is nothing more to be done. The resulting necessary truth, one generally at least having an 'if . . . then' structure, is known to be true. But this cannot settle any issue of natural science. However much deduction be involved, to settle questions in the natural sciences, recourse must be made to observation. In many difficult cases, extensive observations still fail to settle the issues. But though observation is not always sufficient, it is always necessary.

This appears to me to set up an unbridgeable gulf between the rational and the empirical sciences. Avoiding the difficult problem of just what is the status of the primitive premisses in the deductive sciences, the *a priori* nature of the procedures of these disciplines, and the settling of issues by proof, makes them quite different from the natural sciences. And where there is proof, there will generally be knowledge, and so knowledge is far easier to come by in this area than in the natural sciences.

This does not make things easier for me as a naturalist. A close relative of Kant's famous question returns to haunt me: how are the rational sciences possible? How can there be this huge, continually increasing, body of *a priori* knowledge? Have we, as many mathematicians and logicians have believed, access by a faculty of reason to a supersensory realm of mathematical and logical entities? To accept this would be for me an abandonment of my naturalism. Far worse, even if there were such a realm, I do not see how it can plausibly be thought that such entities could act causally on our sublunary minds. And if they do not so act, how can we give any decent psychological explanation of how we come to acquire such knowledge, or, alternatively, how it comes that we innately possess such knowledge, buried deep in the structure of our minds?

The difficulty is great. The solution, I think, must be far-reaching. But leave that aside for the present.

Here, at any rate, is what I think is our proper epistemic base. First there is our Moorean knowledge. This is really the epistemic base of our epistemic base. It is the epistemic background of our lives, without which no further knowledge could be supported or even, I think, acquired.

To this Moorean base we have been able to add much. Starting about two and a half thousand years ago, for a long while in a start-and-stop sort of way and even falling back at times, but now in a steadily accelerating curve—no guarantee that the present slope of the curve will continue, of course—we have made amazing progress in the natural

and the rational sciences. In the rational sciences we even have proof. The latter does not guarantee knowledge—the apparent finding of a proof is not *foolproof*—but after proper checking by mathematicians or logicians, knowledge is pretty well assured. The same certainty is not to be found in the natural sciences and much remains speculative and controversial. However, the natural sciences as they advance are found to be increasingly able to throw their empirical findings into mathematical form. I don't think that anybody knows why this is so. Eugene Wigner spoke of "the unreasonable effectiveness of mathematics."[2] Perhaps it is just a brute fact about the world that it has a structure that lends itself to mathematization. But natural science has been able to get a free ride, as it seems, from our great and continually increasing mathematical knowledge.

But, I say, this is all that we have in the way of knowledge. This gives us, to use the subtitle of one of Bertrand Russell's last works, "the scope and limits of human knowledge."

We can draw important epistemic morals from this. One moral that I draw is that in the fields of philosophy and religion there is no *knowledge*. We can only know what our beliefs are. For consider: In these fields there is no consensus of opinion about what is true. People who are intellectually competent to discuss these matters, who have genuinely studied the considerations for and against some view—the existence of God or the existence of universals—who know the arguments, who have read and understood the books and the articles—find themselves in complete disagreement. Surely we should not claim knowledge in these matters. We all have our hopes. Perhaps some of us do have knowledge about these difficult matters. But how can we have any rational assurance that we do have knowledge? It is prudent, and suitable to our nature, to claim no more than belief.

This should lead us, I suggest, to a moderate and mitigated scepticism in these fields. We should not claim to know. And this, I would like to point out, applies just as much to those of us who are naturalists as it does to antinaturalists. There was a tendency among naturalists—think of the old crusading 'rationalists'—to believe that all the dogmatism is on the other side, on the side of the believers, believers in the Christian God, for instance. The tendency may be still there. But we naturalists should remember that people who are just as bright as us, in some instances brighter, have studied the same material, considered the same arguments, and have come to the opposite conclusion to us. This should give us epistemic pause. The pause ought to be symmetrical.

I am not, of course, calling for suspension of belief in cases where we cannot rationally claim knowledge. That would be psychologically

impossible, and even if it was possible it would, I suppose, have the effect of stifling epistemic advance because beliefs (and inclinations to believe) supply us with the hypotheses, the ideas, which are required to make such progress. Whatever we may think of Karl Popper's philosophy of science—and I believe with my late friend David Stove that Popper's views on induction lead to an anti-Moorean scepticism—we can agree that the free play of theories, conjectures as Popper has it, plays an essential role in the advance of knowledge. Conjectures have their place even in the *a priori* disciplines. And, incidentally, where would we philosophers be without Goldbach's unproved conjecture that every even number is the sum of two primes?

I suppose that, in matters of importance, we should try to make those of our beliefs that fall short of knowledge as rational as we can. To that end we should be prepared to consider both evidence for, and evidence against, these beliefs when occasion presents itself. That is a path of intellectual virtue. But there can be no question, as Peter van Inwagen has recently pointed out, of the policy advocated by W. K. Clifford that the strength of our beliefs should be proportioned to the evidence that we have for them.[3] That is an epistemic fantasy. There is certainly no way in practice to carry out this puritan proposal for all of our beliefs. Even to try to apply it in the case of one individual belief would face both a regress—the evidence will be something one believes—and a deep difficulty as to whether there is an available notion (objective and at least to a degree quantifiable) of how evidence that does not entail supports a conclusion.

That, then, is a brief sketch of my normative epistemology. One further philosophical moral that I draw from it is a deep suspicion of *eliminativisms*, in particular eliminativism about the mental. This eliminativism, at least, attempts to reject part of the Moorean corpus. We all know, except perhaps very young children and the deeply autistic, that all of us have pains, thoughts, beliefs, purposes and so on. You can ask how it is that we have such knowledge. That is a legitimate psychological and perhaps a philosophical question. But you must begin by accepting the fact and our knowledge of the fact. Perhaps a minimal eliminativism about the mental can be given some countenance. Go back to the case of the sun rising. Suppose somebody denies that the sun rose today. They could, I suppose redeem themselves by pointing out that 'rose' is an inappropriate word in this astronomical context. It isn't like rising from one's bed or chair. The truth is that the earth continued its slow spinning, revealing the sun to view. We could accept that as a piece of pedantry. It might even be useful for children or others who did not know the facts. Now if the true theory of mind is materialist, as I believe, then one might suggest that mental talk is to

some degree infected with antimaterialism, somewhat as talk of the sun's rising is infected with antiheliocentrism. Perhaps, but I do not see the point of reacting to this suggestion by changing, or trying to change, the way we talk. I suggest that in the mental case we do best to pour our new wine into the old bottles. We should stay with Hume who, in the course of developing his (very implausible) image theory of belief, remarks of the phenomenon he is discussing "its true and proper name is belief."[4] Here he comes back to a Moorean wisdom.

2. ONTOLOGY

So much for my normative epistemology. It would obviously be compatible with antinaturalism, but it is also compatible with naturalism. And it seems to me to lean, though no more than lean, in the naturalist direction. Now I shall argue, as a philosopher, for an ontology that I think could reasonably be called Naturalist. I suggest, as a plausible hypothesis, that reality, the whole of being, is constituted by the spacetime world. This is my ontological naturalism. For the rest of this paper, I will try to develop more exactly what it is that I wish to defend, and argue for it as best as I can in brief space.

The first point I make, a point where misunderstanding is likely enough, is that this thesis of ontological naturalism is not to be identified with the thesis of physicalism. Physicalism gives ontological supremacy to physics, not indeed to current physics, but to physics if and when it is completed. The properties, relations and laws of such a physics are the properties, relations and laws which, together with boundary conditions, determine the whole working of the spatiotemporal system. I give my allegiance to physicalism, but it is a more speculative doctrine than naturalism. Michael Devitt, also a physicalist, has spoken of "the physicalist dream." One can certainly be a naturalist without being a physicalist, as for instance 'emergentists' are. It seems further that one can be a physicalist without being an ontological naturalist as I have defined naturalism. Again, one might be a theist, believing in a transcendent deity, yet be a physicalist about the spacetime world. My interest here is with ontological naturalism alone. I am not here arguing for physicalism.

Leaving this negative point aside, I point out that I intend my thesis to range over all space *and all time*. The latter is the controversial point. My existential quantifier ranges over past, present and future. I am thus opposed to the doctrine of Presentism, that only the present exists, a view strongly upheld among many of the metaphysicians in the great philosophy department of the University of Notre Dame. I also reject what I find the more attractive doctrine upheld by C. D. Broad

and in our day by Michael Tooley, that the past exists, but the future does not, with the present the growing edge of being. (Should we call it Pastism?) My main—though by no means my only—argument here is the truthmaker argument. I maintain that truths must have truthmakers. Truthmakers are not truth conditions, but are whatever it is in reality in virtue of which a truth is true. Truthmaker theory, now a small but growing industry among Australian philosophers and others, is a revival of the correspondence theory, but without the crippling assumption that truths and truthmakers must stand in a one-one correspondence. (Compare the idea that predicates and the scientifically natural properties and relations do not stand in a one-one correspondence.)

Surely we can sometimes speak the truth about the past and about the future. (I am not talking about knowledge.) That seems Moorean. By Truthmaker, these truths must have truthmakers. The natural and obvious truthmaker, to say the least, is the really existent past and future This argument has recently been developed at length against Presentism by Simon Keller, an Australian graduate student at Princeton, in an as-yet-unpublished paper (no influence from me). Correspondence theories of truth have been on the philosophical defensive in recent years, yielding ground to minimalist theories which better fit the temper of an age at once oversceptical and overcredulous. But a naturalist must surely defend the objectivity of truth, and upholding a correspondence theory is a natural way to defend such objectivity.

Scientific investigation may reveal, or make plausible, that spacetime has a stranger 'shape' than the simple old four-dimensional picture. Consider the speculative idea developed, as I understand it, in order to deal with some of the metaphysical difficulties in quantum theory, that the world is continually splitting and then proceeding into the future on a series of parallel tracks that are completely causally cut off from each other. This would be no more than a strange shape to spacetime. Again, string theory contemplates further dimensions to spacetime, seven to be precise, existing in a closely rolled-up form.

The moral of all of this is that, while the naturalist may assert that the spacetime world exists, we should be extremely open to the idea that we have only just begun to penetrate to the deeper nature of this world. Wilfrid Sellars gave us the wonderful idea of the contrast between the manifest image of the world, roughly, the picture of the world available to commonsense inquiries, the sort of picture, say, that could have been formulated by an intelligent yet sceptical hunter-gatherer; and, on the other hand, the strange scientific image of the world that physics and cosmology begins to articulate for us. Naturalist philosophy, I suppose, should be a philosophy of the scientific image. In terms of this distinction, we should be open, if science leads us in that direction,

to a transition from the manifest image of spacetime—the Newtonian image perhaps?—to something that, at the phenomenological level, is utterly unfamiliar.

But, as a Naturalist, I do wish to assert that the spacetime realm exists. This seems not to be a Moorean truth, at least in harmony with the epistemics that I argued for earlier in this lecture. For it is a doctrine that, though widely accepted, is not quite uncontroversial among the learned. There are, for instance, at least two able and informed contemporary analytic philosophers who reject the notion of a physical world existing independently of our minds in favour of a Berkeleian Idealism, complete with a Christian God. They have written books of philosophy—good books—in defence of these views. These are John Foster of Brasenose College in Oxford and his friend Howard Robinson, who teaches at Liverpool University. I call them collectively the Oxford Idealists. Given the epistemic principles I have argued for, it seems we should say that the view that the spacetime world exists is a view that we should not account as part of our *knowledge*. (Or could we say instead that these philosophers simply have an unorthodox view of the *nature* of the spacetime realm? There are precedents in Berkeley's thought for taking this line.)

But, of course, the important part of my ontological naturalism is not its positive but its negative contention. So, allowing me the spacetime world, let me spend the remainder of this talk in philosophical defence of the idea that over and above the spacetime world, there is nothing further that exists.

There are two completely different streams of attack, one launched by philosophers and one launched by the religious. As you will see shortly, I am, though rejecting both attacks, in some ways more in sympathy with the religious thinkers than the philosophers. Taking the philosophers first, we find them postulating all sorts of entities that are 'distinct existences' from the spatiotemporal world. Philosophers know the list: there are Platonic Ideas or Forms, there are universals, there are mathematical and logical objects, there are other possible worlds realistically construed, there are, in this century anyway, classes.

I find a great difficulty in all of these postulations, and that is that all of these entities lack causal power in the spacetime world. They are, to adapt jargon from the philosophy of mind, epiphenomenal. Following Plato's Eleatic Stranger in the *Sophist*, I advocate a labour theory of entities. What we postulate should always, in some way or other, make a causal contribution to the workaday world of spacetime. I think that this always holds for the theoretical entities postulated in natural science. Curved space, for instance, in the theory of General Relativity,

makes its causal contribution. So does every fundamental particle in quantum theory. And so also, be it noted, does the transcendent deity of Christianity, indeed, the deity of all of the peoples of the Book. God is causally powerful if anything is. (The thing is carried to an unfortunate excess in the philosophical theory of Occasionalism, where all causal power is supposedly reserved to God. Trust philosophers to overdo a good thing.)

Naturalist policy, I suggest, should be, in every case where these philosophical postulations seem of value, to attempt to 'bring them down to spacetime'. For instance, I myself accept that there are universals, although I think it is up to science rather than philosophy to tell us what universals there are. But I would see the claim that there are universals as no more than the claim that different things, different natural things, can have the very same properties and relations, with 'same' used in a perfectly strict sense. A special realm of universals is not required. The general idea I follow is to enrich the structure of the spacetime world somewhat beyond the rather impoverished set of ontological categories that many empiricists and naturalists hope to get by with. A further thing that is needed, I think, is genuinely singular causation in the world as opposed to mere regularities. But I cannot argue for these theses here.

But mathematics, including set theory, remains a difficulty. For me the infinite numbers, discovered by the genius of Georg Cantor, bring out the difficulty sharply. These numbers exist, it would seem: the number of the natural numbers, the greater infinite number of the continuum, and so on without end. Can we bring them down to spacetime? Perhaps spacetime in its largest or in its most minute extent, does actually exhibit classes having some or all of these numbers of members. But we don't know that it does. Perhaps what there is, the spacetime world, though unimaginably huge, is nevertheless finite in nature.

My response to this great difficulty is to adopt a radically deflationary attitude to what the word 'existence' means inside mathematics (and logic). When Cantor, reasoning *a priori*, mathematically, proves to us by the beautiful diagonal argument that there is an infinity of infinite numbers, what has he shown? Only, I suggest, that these mathematical structures involve no contradiction. They might exist, they are possible. What mathematical structures are actually to be found in reality is for the natural sciences, if they can, to decide. It is my hope that this line of thought can deal with the problem set by the existence of the *a priori* rational sciences.

What then of the religious case for thinking that there is more to the world than a purely physical system? I think that there has to be

argument: mere faiths, as has often been observed, differ so much among themselves that they cancel each other out. For myself, I agree with Paley and, interestingly, John Stuart Mill,[5] that the Argument from Design, the argument from the eye and so forth establish a *prima facie* case for a designer or, more cautiously for some objective teleology in the world. I have for a long time been rather amazed at Hume's apparent blithe confidence to the contrary in his admittedly wonderful *Dialogues on Natural Religion*. But it seems now that Darwinian and neo-Darwinian natural selection can explain teleology in the organic realm, so either Hume's intellectual instincts were sounder than mine, or he was lucky.

But the Argument from Design has, in our time, been resurrected by shifting to the problem of the fundamental constants in nature. It appears that the emergence of life and then mind depends on an incredibly unbelievably sensitive and "lucky' setting of these constants.[6] Without such settings, there would be no stars, so no planets, so no life-bearing objects, so no mind. Is there not some ground here for postulating an objective teleology, a purpose at work in the world? I am disposed to give this phenomenon a little weight. Some philosophers whom I have discussed this with do not. Just the way things happen to be, they say. For myself, though, the argument needs to be addressed. It does seem to give some invitation, not a particularly strong invitation, but a real one, to an 'inference to the best explanation'. Unanswered, it warrants at least some mild agnosticism from naturalists. It shortens a little, perhaps only a little, the long odds against a design to the world.

There is a one naturalist answer, which, if correct, would be a complete answer. Andre Linde, the Russian physicist and cosmologist, has suggested that our 'big bang' is but one occurrence in a more embracing process whereby such explosions spawn explosions indefinitely, giving rise to a series of 'local' spacetimes, of which our spacetime is but one.[7] The fundamental constants might then be thought to be 'set' somewhat differently in the different 'localities'—they would not be really fundamental. Life and mind could only emerge in the enormously rare cases where the constants allow the emergence. No reason then to see any objective teleology in the world. But note that this cosmological hypothesis is quite speculative. I think that, in order to be, like Hamlet, 'indifferent honest', the naturalist ought to keep an eye on this whole argument.

The mind (not mere life) presents another line of argument to the antinaturalist, one that many find appealing. A good many would maintain—many philosophers, many who are religious, some who are both—that the mind cannot easily be explained in naturalist terms. For

instance, some argue that minds are only half in nature because, though temporal, they are not spatial in nature. I have not been able to consider this argument here. It would require much space. But to make my sort of ontological naturalism plausible will, I think, require some sort of wholly-within-spacetime theory of the mind.

As I judge the matter, the balance of the evidence favours a naturalist worldview. But while I believe that in philosophy we should all 'fight for our corner' and argue vigorously for our point of view, we should also practice a moderate and mitigated scepticism[8] and remain conscious of the more or less serious difficulties our own position is sure to face. I have tried to illustrate this in my exposition of the principles which I think a naturalist should uphold.

NOTES

1. *Treatise of Human Nature,* bk.1, pt. IV, sec.1.

2. Eugene Wigner, "The Unreasonable Effectiveness of Mathematics in the Natural Sciences," *Communications in Pure and Applied Sciences*, 13 (1), Feb. 1960. See also R. W. Hamming, "The Unreasonable Effectiveness of Mathematics," *American Mathematical Monthly*, 87 (2), Feb. 1980.

3. Peter van Inwagen, "It is wrong, Everywhere, Always, and for Anyone, to Believe anything upon Insufficient Evidence," in *Faith, Freedom and Rationality*, eds. Jeff Jordan and Daniel Howard. Rowan & Littlefield, 1996, 136–153.

4. *Treatise of Human Nature*, bk. I, pt. III, sec. VII (first published in the *Appendix*).

5. John Stuart Mill, *Three Essays on Religion: Nature, The Utility of Religion and Theism*. London: Longmans, Green, Reader and Dyer, 1874 (posthumously published).

6. John Leslie, *Universes*. London and New York: Routledge, 1989.

7. "The Self-Reproducing Inflationary Universe," *Scientific American*, 271 (5), 1994, 32–39.

8. I take the phrase 'mitigated scepticism' from Hume (*Enquiry Concerning Human Understanding*, sec. XII, pt. III), where he contrasts it favourably with Pyrrhonism, that is, 'excessive' scepticism.