Before, Above, Beneath, Below: Metaphysics and Science in Descartes

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[All references to Descartes are to *The Philosophical Writings of Descartes*. 2 vols. Ed. and trans. John Cottingham, Robert Stoothoff, and Dugald Murdoch. Cambridge: Cambridge University Press, 1985.]

Where modern metaphysics is concerned, Descartes remains a name to conjure with. Current defenders of human intuition, critics of the identity theory of mind and body, mysterians, and proponents of the will as a causal agent capable of initiating actions, can all trace their ancestry to Descartes, as can philosophers who hope to prove that they are not brains in a vat, or deceived by perfect simulacra and facades.

In *The Evolution of Modern Metaphysics*, Adrian Moore urges us to look beyond this legacy and to consider Cartesian philosophy as metaphysics and epistemology ‘in the service of science,’ and as consequential for philosophical anthropology and so practical philosophy as well. Unlike Wittgenstein, who, Moore says, maintained that the role of philosophy was to remove puzzlement and clarify the ordinary usage of terms, Descartes thought the purpose of philosophy was to serve as the foundation of a science, one indeed that would render human beings ‘lords and masters of nature’ (VII: 62; C I:142-3 ). Unlike Quine, who denied that there could be a sharp dividing line between knowledge derived from experience and knowledge secured *a priori*, and that all is revisable in the face of the tribunal of experience, Descartes considered metaphysics to be *a priori* and to be absolutely certain, rather than provisionally acceptable or even ‘morally certain.’

It might seem remarkable that we can still discuss and argue about what Descartes was really up to. He presents, though, a special problem for the interpreter and commentator. On one hand, the mode of presentation of his most familiar work, the *Meditations*, the first person narrative, allowed the author to present a singular, continuous line of argument of a degree of elegance and coherence—though not deductive impeccability--that has never been replicated. On the other hand, this choice of literary form allowed him to employ an alter-ego with overlapping, but somewhat different aims and interests from René Descartes, the historical person.

 Moore’s chapter on Descartes in the context of the book as a whole prompts reflection on the notion of progress in metaphysics and its relationship to the empirical sciences, and in the first part of this essay I’ll try to explain how I believe Descartes understood relations between science and metaphysics. In the second half, I’ll explore the two alleged gaps, one having to do with *representation* and the other with *embodiment* that Moore identifies in Cartesianism.

I.

In his *Discourse* *on Method* Part V, Descartes refers to ‘the whole chain of other truths that I deduced from these first ones’ (C I:31 AT VI: 40). ‘These first ones’ were the existence of God, of an incorporeal soul, and the truth of clearly and distinctly perceived propositions. Some other first truths discovered included that fact that there is some ‘foundation of truth’ for all that we experience and imagine, even if not all experience is veridical and even if most of what we imagine will never happen. The ‘whole chain of other truths,’ as we know from Descartes’s biography, were the specifically Cartesian theories of light, heat, colour, the vortices, the laws of nature, and the animal machine and its circulatory and nervous system that he had already written about a decade before the *Discourse* (1637) and the *Meditations* (1640) in his *World* and *Treatise of Man* (c. 1630) but suppressed. Some of his physical and bio-medical theories would appear in his *Principles of Philosophy* (1644), others only after his death; and others still were lost or destroyed in manuscript.

The *Meditations* suggests that metaphysics came first. The two-substance theory was supposed to support Descartes’s corpuscularian-mechanical treatment of physics, cosmology, and life, while his theology was supposed to support his trust in his own reasoning abilities and his confidence in the invariability of the laws of nature. In fact these foundations were laid after the building had already gone up.

 This retrofitting of foundations would not be considered poor intellectual engineering in mathematics or logic; the calculus was used to good effect in celestial mechanics before Cauchy gave it foundations; many sums were done with arithmetic before Peano gave it foundations; and every human being made use of elementary logic before it was understood to be a part of algebra or the theory of sets. But the Cartesian sequence raises the question whether empirical science really needs metaphysical foundations and whether revisions to empirical science demand revisions to its foundations.

The claim that metaphysics is foundational for science, Moore impresses on us, is very far from the way we think in the post-Wittgensteinian and post Quinean world. Metaphysics and science remain to some extent entangled. Some branches of analytic metaphysics contain expert treatments of space, time, and causality, but these are of little interest to the practicing theoretical physicist; they form a notoriously self-enclosed discourse. It is only in the popular science literature that genuine attempts are made to connect an experimental literature with philosophical ‘ideas.’ As Moore’s book shows, the first and last practicing philosopher who claimed to be deducing, even in the loose Cartesian sense, science from metaphysical foundations, would seem to be Descartes himself. Although our current theories of light, colour, and the animal machine are very different from Descartes’s, there has been no further meditational exercise that either pretended to present new *a priori* metaphysical foundations for contemporary science or that has retrofitted them.

There are accordingly several ways of understanding why the practice of scientific enquiry no longer seems to need or even to possess metaphysical foundations. One might argue that it needs them and has them and that they have simply become invisible through long familiarity. On this account, the foundations provided in the 17th century by Descartes and his contemporaries (Bacon, Galileo, Gassendi, Boyle, Newton) to launch empirical science have proven so serviceable that, except in the physics of the very small and the very large, and in some regions of biology, where technology does not reach or barely reaches, we continue to use them. We continue to assume, along with Descartes, that subvisible material microentities devoid of intelligence and intention and constrained in how they can move and react are responsible for all the events and processes discerned by the naked eye, indeed all events and processes that can be visualised or imaged using optical and electromagnetic technologies. We assume along with him that and that causal, naked eye observation of nature does not take us very far in the absence of instruments, dissection, and magnification, and that hypotheses compete with other hypotheses rather than being matched or unmatched directly to Reality.

This view of how science works, except in the regions of the too-small and the too-large to visualise or image, now seems to us so obvious that we forget that it had to be fought for. Philosophers had to subdue the view that experimentation was artificial and therefore could not reveal ‘nature’; that optical technologies were useless or even distorting, and that the supposition that the material world was composed of aggregates of particles devoid of colour, odour, and taste was incoherent. They had to set aside the Aristotelian view that mathematics describes ideal objects and therefore cannot be applied to the world of experience. At the same time, the epistemology of ‘logic’ and ‘demonstration’ had to give way to an epistemology of hypotheses, likelihoods, and model-building.

Another answer to the question why contemporary science has and needs no new Descartes is that the 17th century context was different both from the ancient context and from the contemporary context which resemble one another in some respects more than they do early modernity. The motive of all-embracing general curiosity—the desire to ‘make sense of things generally’-- might well be ascribed to Aristotle, to his Ionian predecessors, and to Epicurus and to Lucretius, belonging as they did to a prescientific, pagan world, divided into schools or sects of general philosophy. The desire to ‘make sense of things generally’ may also characterise the contemporary practitioner of metaphysics and epistemology, because he or she belongs to a world in which theology is optional and science is, as just observed, a separate discipline. Metaphysicians can contemplate, that is to say mentally manipulate and rationally rearrange abstract ideas drawn from the tradition to their heart’s content without being in the service of any other endeavour.

The seventeenth century situation was very different in two respects. The retrofitted ‘foundations’ were selected by Descartes because they fit to his programme of understanding and dominating nature. Christian postlapsarian epistemology which represented human beings as fatally flawed, intellectually as well as morally, was unsuitable, as was scholastic-Aristotelian philosophy with its elements, forms, and occult qualities, and its futile search for demonstrative knowledge. Cartesian epistemology, as presented in the *Meditations*, slyly portrays empirical enquiry into the structure of the human body and the mechanisms behind perception and sensation as the continuation of reasoning processes that earlier led to the excellent conclusions of the existence of God and the incorporeality (hence putative immortality) of the soul. Physiological investigation was thereby rescued from the suspicion that it reflected idle curiosity, or punishable hubris, or devilish involvement with secrets God intended to leave hidden, or that it was simply disgusting and taboo in its hands on involvement with dead bodies and their fluids. In this regard, Cartesian metaphysics is not the work of an underlabourer setting foundations; it is rather an attempt to show how the investigation of material nature is bound up with the higher knowledge of God and the soul, a triumph Descartes achieves only in *Meditation VI*. The general philosophy of nature that Descartes and his contemporaries were reviving was a version of pagan materialism. Whatever the individual and likely fluctuating pattern of doubt, faith and intellectual conviction in a given early modern philosopher at a given moment might be, the treatises presented to University and to other clerical and learned audiences had to be fitted into a Christian frame. Aristotle could be sacrificed (and even condemned as a pagan philosopher), but monotheism with its command-issuing creator and the Christian revelation and its promise of immortality and reward and punishment could only be nudged.

From Descartes to Kant, the canonical philosophers were deeply concerned with figuring out how not so much how to ’make sense’ of things in general as how to make sense of religion and morality, given the sense that experimental science was making, or promising to make, or at least trying to make, of things in general. The new science needed foundations in this respect. It needed to find a circumscribed place within a larger metaphysical framework in which the power, benevolence and providential care of God, the freedom of man, his privileged status amongst the animals, and the immortality of his soul could be upheld. For science to be tolerated and even supported, as Descartes pleaded for it to be in *Discourse* VI, people needed to be persuaded that science is not undermining of their hopes and their habits of moral judgement.

Strictly speaking, then, 17th century *science* did not need metaphysical and epistemological foundations for enquiry to proceed. The microscopes and air-pumps could have been put to use, the distillations, chemical reactions and pyrotechnics carried on, and the machines built, without a thought being given to metaphysical foundations. When Descartes reproached Galileo for having ‘built without foundations’ (AT II: 380), it was the *fate* of Galileo, that Descartes took such pains not to have to share, that concerned him as much as the security of Galileo’s findings. Descartes’s claim that an atheist can never be secure in his mathematical beliefs (AT VII :141) ought to raise a few commentators’ eyebrows. Descartes did not, I think, consider his own researches doubtful before he hit on the arguments for the truth of clear and distinct ideas, though he assuredly thought that the ‘science’ of many other people was not based on clear and distinct ideas.

The pure metaphysician of today has no need to construct her ontology or her epistemology with such exculpatory aims in mind. For personal reasons or group-identification she may wish to construct her general account of things and how they are to be known in such a fashion that belief in the existence of a God or Providence is an element of the scheme or at least not excluded by it. She does not, however, need to construct an ontology and epistemology so as to be able to carry out scientific research with a clear conscience and without worrying about how it will appear to the theologians. Indeed, the institutional power of contemporary physics, chemistry and biology – reinforced by the fact that we have become for better or worse, masters and possessors of nature—is such many of its practitioners see no need to fit their activities into any more exalted framework, including a moral framework. Instead utility—more lives saved, better medicines, a sharper image, less expense-- is constantly and tiredly invoked whenever questions of worthwhileness suggest themselves.

To summarize, my claims in this section are: (1) 17th century metaphysics and epistemology were not ‘pure enquiry,’ though Descartes presented his investigation in the *Meditations* as such, referring only to his desire to establish something in the field of knowledge (‘*in scientiis*’) ‘that [was] stable and likely to last.’ Metaphysics and epistemology were tightly bound to personal, political, and utilitarian aims, and reflected moral and theological concerns. (2) Descartes could have chosen to carry out his enquiries *without* providing metaphysical foundations for his science; Newton would later avoid this task as far as he could, ending the *Principia* with exalted subjects but conspicuously not beginning with them. (3) Scientific practice in the context of 17th century institutions and concerns perhaps would not or even could not have gone forward if its practitioners—not only Descartes but also Gassendi and Boyle-- had not provided metaphysical foundations to explain and justify experimental and observational science to themselves and to the world. (4) Scientific practice in the context of 21st century institutions and concerns no longer needs metaphysical foundations of the sort that were publically required in Descartes’s time, involving a general theory of God, the soul, and the world. (5) Descartes bequeathed to scientific posterity certain fundamental assumptions about the material world and the human mind that are still in use.

The historical person René Descartes puzzled his friends by writing the *Meditations*. It was deeply out of character for the natural philosopher they thought they knew. Why would an iconoclast, so famously critical of scholastic philosophy and so deeply hostile to the Aquinian vision of the world as created and designed primarily for man and secondarily for the other creatures, avail himself of scholastic concepts and scholastic principles in composing a treatise? Why would he insert the unoriginal ‘ontological’ argument for the existence of God into Meditation V? Why would a philosopher fascinated by the somatic basis of sensation, emotion, and memory and determined to explain how the brains of animals could produce them go to such lengths to defend the immortality and incorporeality of the human soul? These are questions we can profitably ask about Descartes, but not about the *Meditator*, who presents himself as simply a person with some leisure time, frustrated by the plethora of books, opinions and disputations around him, and uncertain what to believe.

 There is, however, overlap. René Descartes the person was determined to show that that material objects are not unfathomably mysterious; that their invisible parts possess only extension, figure, and motion; that there are no mental and no active powers in material substance. He was also determined to show that human beings possess good minds, so long as they proceed along the paths of inference in a steady and controlled fashion, and good bodies that, despite their liabilities to illness, preserve the lives of individuals. Life, in this world, is good and ‘God,’ if not precisely identical with Nature, has made minds and bodies good as well. It is up to human beings to investigate the causes of disease, suffering, aberrant appetites, and death, which are to be regarded as mechanical defects or breakdowns, signifying nothing beyond themselves.

II.

I turn now to two difficult stellae in the text of Descartes’s *Meditations* that Moore discusses in an equally interesting fashion. The first is the problem of transition from the inability to doubt that p, a psychological state , to the truth of p (a proposition) or ‘p’ (a sentence). Was Descartes really authorised to infer that whatever he could perceive clearly and distinctly, and was on that account unable to doubt, was true?

I think he was authorised, even without bringing in the benevolence of God and thereby introducing the problem of the ‘Cartesian circle,’ and that his way of making the transition is philosophically underappreciated.

Note that the problem of the transition from subjective awareness or ‘representation’ to objective truth, when fully explicated, is simply the most generalised possible version of the veil-of- ideas paradox for visual perception. The solution to one may therefore be applied to the other. The paradox of perception goes like this: As persuaded as I am that I perceive a tree, or anything else whatsoever, I am only reporting on my subjective awareness; reality might be altogether different from my current presentation to consciousness, and I am accordingly prevented from ever *knowing* that I perceive a tree. But if reality is imperceptible, there is nothing it would be like really to perceive a tree and to know that I am doing so. Thus I am not blocked or held back from some possible epistemic achievement. So my knowledge condition is perfect just as it is and is always perfect just as it is.

This argument can be spelled out more elaborately in Cartesian terms as follows:

1. External things in the world are the *cause* of our sensory experiences and psychological states of which we are immediately aware are the *effects*. Since we are aware of the effects, we aren’t aware of the causes. Therefore, all our sensory perceptions are false and give us no knowledge.

(2) We always know that of which we are consciously aware, which is all there is to be known through perception. Therefore all our perceptions are known incorrigibly and are true .

Some commentators think that Descartes accepts both these arguments, that he holds an error theory and a theory of incorrigibility too. But this cannot be right. Descartes subscribes to the commonsense view that perception usually, but not always, delivers knowledge of what is the case. For he says at the end of Meditation VI that ‘in matters regarding the well-being of the body, all my senses report the truth much more frequently than not’ (AT VII:89). Ordinary perception does not, however, give us all the knowledge of the world we need in order to be able to explain how all the other phenomena of nature, including perception itself, occur.

A parallel argument for why beliefs are either *never* or *always* veridical can be mounted as follows: Beliefs are the effects of what happens at the periphery of the body, processed or massaged by our internal filters, molds, modellers, and enhancers. We don’t apprehend reality ‘directly.’ But then if there is no such condition as the condition of apprehending reality directly, then we simply apprehend individual sensory- fantasy worlds in which certain things are the case and other are not that are constituted by our constantly changing belief-sets.

To get out of the nothing-or-all-dilemma for perception, we first distinguish between the theoretical account of the world that has an explanatory power that the perceptual account of world does not, and the perceptual account of world relative to some perceiver or implied group of perceivers. Leaving aside theoretical truth or ‘truth,’ veridical visual experience, *seeing things as they really are,* is a matter of having a compelling, but at the same time entirely ordinary visual experience that has not been affected by any of the known disrupters of vision such as bad lighting, optical illusions, simulacra, tired, sick or defective eyes, psychoactive drugs and so on, and not being affected by any as-yet-unknown factors *of this general sort*.

Descartes effectively transfers this solution to thinking in general, to what he thinks of as ‘intellectual perception.’ Knowing a true proposition is a matter of having a compelling, but at the same time entirely ordinary experience of thinking ‘That must be right… It must be so’ and *not* being affected by any of the known disrupters of judgement, nor by any unknown disrupters *of that general sort*. For the ‘eye of the mind,’ bodily and environmental disrupters could include being tired, sick or insane, or drunk, or being bullied or hypnotised into subjective conviction, or inferring on the basis of too little evidence, or, in modern terms, being a victim of one of the cognitive illusions that psychologists have recently been bringing to light. The most common disrupter of the process of knowing in general is, for Descartes, being overly eager to assent to an intellectual presentation. The best technique for satisfying oneself that this disrupter is not active is to stop, or slow down and to interrogate oneself as to whether the data are sufficient to warrant the belief and whether the belief is ‘clear and distinct.’

 The weakness of Descartes’s account is that it can account for the verdicality of everyday perception and for the truth of commonsense beliefs, but it does not account for the truth of theoretical accounts of nature. Take, for example, his vortex theory of planetary motion, or his explanation of the generation of salt crystals or the magnet. It is not the clarity and distinctness of his beliefs concerning these matters—or of mine that water is H2O-- that can ensure their truth or ‘truth,’ even the absence of known and unknown disrupters such as being tired or drunk, affecting Descartes or me when we assent to the corresponding proposition.

 The problem of theoretical truth was indeed one with which Descartes struggled with in the last sections of the *Principles of Philosophy*, veering between the claim that all his scientific statements were absolutely true and the admission that they accounted coherently for the phenomena and had no serious competitors (AT IX-2 327-329). Empiricists like Van Fraassen may be right to dispute the view that we *believe* propositions of science and that they can be true or known to be such, as opposed to being accepted by a community of investigators as empirically adequate. Scientific ‘knowing’ where imperceptible reality is concerned is a matter of having decided for a theory in a broad, multi-participant, time consuming context of scientific enquiry, which Descartes’s individualistic approach to knowledge cannot accommodate.

 Summing up, Descartes can make the transition from indubitability to truth in ordinary contexts of perception and belief, but not in contexts of theoretical enquiry. But in theoretical enquiry the ‘indubitability’ of a presentation to consciousness is not at issue in the first place. In such contexts, ‘truth’ and ‘knowledge’ are to be understood differently than in the context of ordinary life and commonsense knowledge.

III. Embodiment

The second problem that Moore finds in Cartesian metaphysics does not concern the gap between perception or belief and reality, but the gap between the self and its world. The problem as he sees it is that “The self, in Descartes’s vision, is autonomous. It is to be conceived independently of its environment , and it directs itself independently of its environment, despite the elaborate story Descartes tells (e.g. *Sixth Meditation*)’ ( p. 41). Moore is not concerned with the not after all very interesting problem of how the mental and corporeal, having no properties in common, and interact, but with what he takes to be a kind of morally and emotionally limiting view. The Cartesian Self, he asserts, ‘directs itself independently of its environment,’ while the environment ‘..is to be conceived independently of the self, indeed independently of all intentionality or purpose.’ The world is thereby ‘disenchanted’ (41-2).

 In some respects, I understand and concur with the claim that Descartes creates a gap between self and world. This gap is evident whether one considers Descartes the historical person or the Meditator. Descartes’s autobiographical narratives always stress his apartness. He presents himself in the *Discourse* as alienated and disenchanted by his humanistic and philosophical education and also as ‘not inferior’ to his fellows –implying he was rather a standout-- in his old school. (AT VI: 4-5 ) He preferred the solitary pursuit of mathematics to the engagement with other minds required by literature and poetry. His letters emphasise his desires to get away from his friends and relatives and to avoid engaging in controversies, and he asserts in the *Discourse* that constitutions, religions, and cities are all better when produced by one person, implying that the same is true of the sciences (VI: 12-3). His account of his adoption of ‘provisional morality’ suggests that he decided to copy conventional behaviour without much intuitive feeling for decorum or respect for the moral law. (VI:23-4) . His private marriage, his episodes of seclusion, and other behaviour reinforces the impression of a strongly independent person who, despite his disclaimer, does present himself as a model. The gap between self and world enacted in the historical Descartes’s choices seems to be mirrored in both the starting point of the *Meditations* as the Meditator finds himself at long last ‘quite alone’ and in the conclusion that his mind and body –and so his mind and the world of which the body is simply another part—are really distinct.

 But the disenchanted ‘world’ that perturbed Max Weber and has perturbed other commentators besides Moore is only the theoretical account of the world; the world of experience retains its colours, and tastes, and all its sweetness and enchantment, thanks to our nervous systems. And in another respect, the claim that Descartes set us going down the wrong path does not do justice to what he argued for, how he was subsequently read, and how his texts were used, and by whom, for what purposes of their own, and to what effect:

Descartes sees the person as a psycho-somatic unity. Its sensory and emotional systems are beautifully, though not infallibly adjusted, to the conditions of its biological and social life. The animal machine is set up to live and thrive, and if what it sees, feels, and experiences is less optimal than could be imagined, this is only because of the constraints posed by the size of the machine and its components, the upper bound of their complexity and the tendency of material things to wear out and fall apart. God (or Nature) could have matched conditions of the body to experiences differently, but ‘there is nothing else which would have been so conducive to the continued well-being of the body’ (VII:88).

 Descartes’s treatment of the emotions was as innovative as his account of visual experience. He makes two critical points in connection with the emotions. They are the source of all good and evil in this life. The most emotional people are those most capable of ‘enjoying the sweetest pleasures of life.’ (XI: 488). The ancients were naïve in supposing that the mind could simply squelch emotions as well as mistaken in thinking it ought to. According to Descartes, we have no direct volitional control over heartbeat, circulation and respiration which are the physical correlates of an emotion (Today we would add the release and uptake of hormones and neurotransmitters). For a Cartesian, this feature of the emotions is consistent with their function in the animal and/or with building constraints which lead occasionally to undesired results. We do however possess some self-calming capacities when their excesses call for a remedy. As Descartes recognises, these require abstraction from the situation, and the use of the imagination to envision future consequences (AT XI:486 ).

 The psychosomatic, organism-centered theme in Cartesianism can be followed through his successors Spinoza, Malebranche and Leibniz, for whom experience is mediated by the body, indeed by the particular sort of organic animal body one happens to have. However, this corporeal focus is not common in the way we teach and write about ‘The Rationalists.’ This raises the question Why did the pedagogical tradition in philosophy (though not in the life sciences) ignore the body-centrism of the Rationalists and instead select from the Cartesian corpus and indeed from the other *corpora* their ‘idealistic’ portions to emphasise and reflect upon?

One reason is surely that the Cartesian starting point in the *Meditations*, the realisation that all my experiences, including my experiences of interacting with an external, semi-resistant, material world and employing my will upon it, could be exactly as they are in the absence of such a world has a powerful appeal to intuition; everyone likes to think about this. But another reason is surely that the assertion of an incorporeal human soul, or in Spinoza’s case, of a universal mind that is identical with the universe, into which we all somehow ‘fit’ underwrites theology and morality. As the sciences and the theory of science began to detach from these departments of theory and practice, metaphysics retained them, and Kant’s ‘critical’ metaphysics recouped them as *its* special province. The history of science has one story to tell about the fate of Cartesianism, the history of philosophy, thanks to Kant, has another in which the ‘bad’ uncritical idealism of the Cartesian-Leibnizian-Malebranchian type was transformed into ‘good’ critical idealism, preserving the autonomy of philosophy in the face of the empirical sciences. Kant is as much to blame for the separation of self from world as his Rationalist predecessors. In fact he is more to blame, insofar as he repudiates the psychosomatic conception of the human being; synthetic *a priori* knowledge does not deal with such contingencies as our having species-specific bodies. I think Adrian Moore would agree with me here; I hope so.

 Cartesianism had its maximum impact in philosophy, then, not as the science of the living and non-living corporeal worlds, but as the fount and origin of the resistance to that world. Descartes himself was a reductionist. He reduced the visible world to particles in motion, and experience to states of the brain and sensory organs plus awareness. No one before Descartes did the latter; earlier corpuscularians favoured ‘soul atoms’ and form-bearing species or coloured films But the profundity of his writing is such that he can be read as asserting the opposite—that theoretical science can never explain awareness, and that human experiences and the experience of linguistic meaningfulness, to which perception is in fact analogous, can never be reduced to a physical or computational process.

IV.

 What bearing does the case of Descartes have on relations between science and metaphysics in the contemporary world? I conclude that both sides of Cartesianism are still represented and need to be. In the experimental and observational sciences, human beings are treated as part of the natural world and subject to all manner of causal influences within it. Will is either desire or preference, or the activation that follows the event of a decision, and even consciousness, we believe, may eventually yield to the study of how systems are able to represent themselves and to model their engagement with the world outside the living organism. These modes of enquiry are Cartesian in the sense of referring to subvisible microprocesses and hypothetical yet intuitive models, and they are also Cartesian in seeing a combination of philosophical analysis and controlled observation, experiment and systematisation as the corrective to the superficial perspectives and folk theories of the ordinary observer with his cultural formation and multiple prejudices.

 The aim of ‘making sense of things generally’ was not, I argued, an aim that could survive the scientific revolution and the splintering of natural philosophy not only into the separate disciplines of science and philosophy, but into a multitude of even more specialised subcategories of enquiry. But metaphysics—as Moore’s book shows us—has somehow, miraculously, survived. Its critics complain that it is a case of the walking dead. Metaphysics, they say, pretends to be a rigorous, demonstrative discipline. But it has neither the rigor, insofar as it deals with vague concepts originating in the vernacular and generates antinomies and *aporia*, nor the potential for application that mathematics enjoys. At the same time, as an *a priori* discipline, supposedly concerned with how things must be not how they happen to be, metaphysics cuts itself off from the data upon which empirical science feeds. Misguided and enfeebled, how can metaphysicians make progress rather than simply presenting, to invoke Bacon in the *New Organon* (XLIV) ‘so many stage plays, representing worlds of their own creation after an unreal and scenic fashion?’

 Descartes did not really intend to set the direction of early modern metaphysics with his new conceptions of physical and mental substance, and ‘ideas,’ or the possibility of radical deception. He inadvertently founded a rich tradition of ‘mental philosophy’ that flourished through the time of Berkeley. But he also gave us the set of assumptions about scientific explanation that we still use for that portion of the universe that is visible or visualisable. It is an open question whether there could be a new metaphysics that would both found a corresponding tradition and give us the metaphysical and epiostemological framework we would need to understand the rest of the physical universe, the unvisualisable part of it, that particle physics and cosmology are now concerned with. Along with Adrian Moore, I am doubtful that even though philosophical curiosity and competence are inextinguishable, Descartes’s achievement in this regard could ever be replicated.