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8 Cartesian dualism: theology, metaphysics, and science

Throughout his life Descartes firmly believed that the mind, or soul, of man (he made no distinction between the two terms)[1] was essentially nonphysical. In his earliest major work, the *Regulae* (c.1628), he declared that "the power through which we know things in the strict sense is purely spiritual, and is no less distinct from the whole body than blood is distinct from bone, or the hand from the eye" (AT X 415: CSM I 42). In his last work, the *Passions de l'âme* (1649), he observed that the soul, although 'joined' or 'united' to the "whole assemblage of bodily organs" during life, is "of such a nature that it has no relation to extension, or to the dimensions or other properties of the matter of which the body is composed" (AT XI 351: CSM I 339). And between these chronological extremes we have the central claim of the *Meditations* (1641): there is a 'real' (*realis*) distinction between the mind and body; in other words, the mind is a distinct and independent 'thing' (*res*).[2] The thinking thing that is 'me' is "really distinct from the body and can exist without it" (AT VII 78: CSM II 54).

The message appears to be all of a piece. The thesis of the incorporeality of the mind seems, from first to last, a fixed point in Descartes' thinking. Indeed the now widespread adoption of the label 'Cartesian dualism' to refer to the incorporeality thesis has had the effect of making that thesis the very hallmark of Descartes' philosophy. Yet though it is undeniable that Descartes did repeatedly assert the incorporeality thesis, his reasons for subscribing to it were by no means homogeneous. This chapter will look at three quite distinct types of consideration that motivated Descartes 'dualism', namely the theological, the metaphysical and the scientific. It will be argued that there is a certain harmony between the first and second of these

strands, even though the relation between them is certainly not one of mutual entailment. Between the second and third strands, by contrast, it will be suggested that there is a certain kind of tension; for whereas Descartes' metaphysical arguments seem designed to rule out even the possibility that dualism might be false, in what may be called his 'scientific' discussions of the nature of the mind, the tone is far less dogmatic, and the outcome far more sensitive to empirical evidence, than the standard expositions of 'Cartesian dualism' normally allow.

THEOLOGY: FROM FAITH TO REASON

Informal soundings of people's views nowadays regarding the incorporeality thesis suggest a tendency to divide along religious lines: committed theists are more likely to be dualists. One important reason for this may have to do with the doctrine of the afterlife, which seems to many to require that that which survives death, the bearer of personality and consciousness, be some kind of incorporeal soul. Was this assumption part of the seventeenth-century background?

Certainly Descartes himself, in his published work, underlined the connection between religious belief and dualism. The Dedicatory letter to the Theology Faculty of the Sorbonne, which was prefixed to the first edition of the *Meditations*, notes that the faithful are obliged to accept that "the human soul does not die with the body" and suggests that a demonstration of this claim by 'natural reason' would serve the cause of religion and combat atheism (AT VII 3; CSM II 4). Although Descartes had a personal interest in promoting his book by obtaining the approbation of the theologians, it would be wrong to dismiss as a mere specious afterthought his professed religious motivation for writing on mind–body metaphysics. For the same motivation is expressed in private correspondence, as early as 1630, when Descartes had recently begun work on the so-called *Petit Traité* – a short treatise on metaphysics (now lost), which was designed amongst other things to combat those "audacious and impudent persons who would fight against God," by establishing the "existence of our souls when they are separate from the body" (letter to Mersenne, 25 November 1630: AT I 182: CSMK 29).

Clearly, in the seventeenth century, as now, any defender of orthodox Christianity is obliged to defend the doctrine of the immortality

of the soul. What is not so clear, however, is that this doctrine in turn requires the truth of dualism. Despite Descartes' insistence on the links between his own metaphysics and the teachings of the Church, the mainstream of orthodox religious teaching certainly did not specify that the bearer of post-mortem consciousness should be an unextended, nonspatial *res cogitans* of the kind envisaged by Descartes; on the contrary, one influential strand in the Christian tradition saw the afterlife in terms of the existence of some kind of new, 'resurrection' body – not, to be sure, this earthly coil of flesh and blood but for all that something having some kind of materiality.[3] If we scrutinize it carefully, however, Descartes' claim is not that his brand of dualism is necessary for the immortality of the soul, but that it is *sufficient* to establish it: the aim of the *Petit Traité* was to establish 'the independence of our souls from our bodies, from which their immortality follows' (*d'où suit leur immortalité*; letter to Mersenne, loc. cit.).

The logic of this last clause evidently worried Father Mersenne, and he chose to voice his doubts in public some ten years later, when compiling the second set of Objections to the *Meditations*. To establish the incorporeality of the soul, he complained, is not *eo ipso* to establish its immortality; God might, for example, have endowed it with "just so much strength and existence as to ensure that it came to an end with the death of the body" (AT VII 128: CSM II 91). In his reply Descartes now admitted that he could not supply a cast iron proof of the soul's immortality. But he urged that we have "no convincing evidence or precedent" to suggest that the annihilation of a substance like the mind can result from "such a trivial cause" as bodily death, which is simply a matter of a "division or change of shape" in the parts of the body (AT VII 153: CSM II 109).

Underlying these cryptic comments we can glimpse something of the gulf that separates Descartes' metaphysics from the ideas of his scholastic predecessors. In the Aristotelian conception of the soul, which is never far beneath the surface of scholastic doctrine, there is an integral connection between soul and body. Soul is to body as form is to matter; and what this means, in effect, is that a given set of functions (locomotion, digestion, sensation) depends on the relevant parts of the body being 'informed' or organized in a certain fashion. One result of this Aristotelian picture is that there is a kind of continuity between all living things. Plants, animals and man, all

things which are alive or 'ensouled' (*empsychos*), belong on a continuum, where matter is progressively organised in a hierarchy, with each function higher up the chain presupposing those functions which operate on a lower level.[4] In a purely mechanical Cartesian universe, by contrast, there is an important sense in which there is no real difference between 'living' and 'dead' matter. "The matter existing in the entire universe is one and the same," Descartes wrote in the *Principles of Philosophy*, 'and it is always recognised as matter simply in virtue of its being extended (Part II, art. 23: AT VIIIA 52: CSM I 232). It is thus a serious error, on Descartes' view, to suppose that bodily death is somehow caused by the absence of 'soul.' As he explained in the *Passions of the Soul:*

> Death never occurs through the absence of soul, but only because one of the the principal parts of the body decays . . . The difference between the body of a living man and that of a dead man is just like the difference between, on the one hand, a watch or other automaton (i.e. a self-moving machine) when it is wound-up and contains within itself the corporeal principle of the movements for which it is designed, together with everything else required for its operation; and, on the other hand, the same watch or machine when it is broken, and the principle of its movement ceases to be active.
>
> (AT XI 331: CSM I 329)

When this purely mechanical view of biology is combined with Descartes' thesis that the conscious mind is a separate incorporeal substance, the upshot is that bodily death becomes, in a sense, wholly irrelevant to the question of personal immortality. Descartes makes the point quite explicitly in the Synopsis to the *Meditations:*

> The human body, in so far as it differs from other bodies, is simply made up of a certain configuration of limbs and other accidents of this sort; whereas the human mind is not made up of any accidents in this way, but is a pure substance. For even if all the accidents of the mind change, so that it has different objects of the understanding and different desires and sensations, it does not on that account become a different mind; whereas the human body loses its identity merely as a result of a change in the shape of some of its parts. And it follows from this that while the body can very easily perish, the mind is immortal by its very nature. (AT VII 14: CSM II 10)

The argument is still not quite watertight; it needs the additional metaphysical premise that a substance, once created by God, is "by its nature incorruptible and cannot ever cease to exist unless reduced

to nothingness by God's denying his concurrence to it" (ibid.).[5] Yet even when this additional premise is plugged in, the 'unless' clause at the end still leaves the argument a shade short of qualifying as a completely rigorous demonstration. There is, to be sure, a strong presumption that a substance, once created, will continue to exist; but this, Descartes reminds us, must ultimately depend on the efficacious will of God, and we cannot know for certain what he has planned for the soul after death.[6] This caveat – coupled with his enduring reluctance to tread on the toes of the theologians – explains why, when questioned on the soul's immortality, Descartes generally stepped back from any claim to provide a logically compelling proof of the matter.[7]

These qualifications notwithstanding, Descartes could still plausibly claim that his own metaphysical system stood on much firmer ground than scholastic metaphysics when it came to the problem of reconciling natural philosophy with the requirements of the Christian faith. The scholastics were faced with a *prima facie* problem about the immortality of the soul. If the Aristotelian 'hylemorphic' ('materio-formal') account of *psyche* is adhered to, then it is not easy to see how a given psychic function, such as thought, can possibly survive in the absence of a material substrate. Admittedly Aristotle himself had, in one notoriously obscure passage in the *De Anima*, introduced the concept of an 'active intellect' which, being defined in terms of pure activity, was supposed to be capable of some kind of 'separation' from the body; but as the Church's struggle with the heretical followers of Averröes later demonstrated, this strange notion hardly provided unambiguous support for anything like the concept of an individual personal consciousness capable of surviving death.[8] The fact remained that the Aristotelian system, on its most natural and plausible interpretation, no more allowed for souls apart from bodies than (to use Aristotle's own analogies) it allowed for sight apart from the eye, or an axe's function of chopping wood to exist apart from the materials that make up its blade. Faced with this difficulty, many theologians were tempted to assert that personal immortality was a doctrine that could not be defended by human reason, but had to be based on faith alone.[9] Against this background, Descartes – and there is no good reason to doubt his sincerity here – saw his own philosophy as breaking new ground.[10] The theologians could now be offered a metaphysic in which con-

sciousness was a *sui generis* phenomenon, wholly detached from corporeal events of any kind, and therefore inherently immune to the effects of bodily dissolution. In providing, as he thought he could, a philosophical demonstration of the incorporeality of the mind, Descartes thus explicitly saw himself as fulfilling the edict of the Lateran council, that Christian philosophers should use all the powers of human reason to establish the truth of the soul's immortality (AT VII 3: CSM II 4).

There is, however, one further twist to the story. What is 'pure' and incorporeal, in Descartes' account of the mind, is intellection and volition, not sensation or imagination. The latter faculties are not part of our essence as thinking things (AT VII 73: CSM II 51); they are, as Descartes frequently stresses, 'special' modes of consciousness which depend on the soul's union with the body.[11] But what this seems to entail is something which Descartes himself never discusses but which occupied the earnest attention of Cartesian disciples like Louis de la Forge later in the century: after bodily death, when the soul is disunited, its cognition will be devoid of all particularity. When sensible ideas and images fade, the soul will be left to contemplate merely abstract and general ideas such as those of mathematics. And this in turn makes it hard to see how any real personality or individuality could be preserved. Just as the Thomists had earlier wrestled with the problem of what differentiates one angel from another, so the later Cartesians were in trouble explaining how one impersonal, disembodied *res cogitans* could be distinct from another. In the end, the ghost of Averröes, which had plagued the scholastics, returned to haunt the Cartesians.[12]

METAPHYSICS: THE RECURRING FALLACY

We cannot know what proofs of the incorporeality thesis Descartes envisaged in his early 'Little Treatise' on metaphysics. In the *Regulae* of 1628 he merely affirms the incorporeal nature of the power of thought, observing that 'nothing like this power is to be found in bodily things' (AT X 415: CSM I 42); and in his 'Treatise on Man' composed during the years 1629–30 as part of his general exposition of physics, *Le Monde*, he largely confines himself to a physiological account of the mechanisms of the central nervous system, simply

asserting that God unites a rational soul (*une âme raisonable*) to the bodily machine, placing its principal seat (*son siège principal*) in the brain, and endowing it with such a nature that it is adapted to have a whole range of sensations corresponding, one for one, to the different ways in which the brain is stimulated via the nerves (AT XI 143: CSM I 102). It was not until his first published work that he ventured to offer a sketch of how the non-physical nature of the soul might be established. In a letter written to Jean de Silhon in May 1637, on the eve of the publication of the *Discours de la Méthode*, he sums up his approach as follows: "a man who doubts everything material cannot for all that doubt his own existence. From this it follows (*il suit*) that he, that is his soul, is a being or substance which is not at all corporeal (*point du tout corporelle*), but whose nature is solely to think (*sa nature n'est que de penser*), and that this is the first thing, one can know with certainty" (AT I 353: CSMK 55).[13]

The wording here closely matches the famous passage in Part IV of the *Discourse*, where, in what is, or ought to be, regarded as one of the most notorious nonsequiturs in the history of philosophy, Descartes moves from the proposition that he can doubt the existence of his body to the conclusion that he can exist without his body – that he is a being "which does not require any place, or depend on any material thing, in order to exist" (AT VI 33: CSM I 127). Even when writing to Silhon, Descartes admitted that his argument was not as accessible as it might be: to make it fully convincing, he says, he "would have had to explain at length the strongest arguments of the sceptics to show that there is no material thing of whose existence one can be certain" (loc. cit.).

But the difficulty in the argument is, of course, not just that the 'method of doubt' is not made vivid enough to carry the reader along. That defect Descartes was amply to make good later in the dramatic monologue of the First Meditation. What remains is the logical flaw which was immediately fastened on by an astute contemporary critic of the *Discourse:*

> From the fact that the human mind, when directed towards itself, does not perceive itself to be anything other than a thinking thing, how does it follow that its nature or essence consists only in its being a thinking thing, where the word 'only' (*tantum*) excludes everything else that could be said to belong to the nature of the soul? (AT VII 8: CSM II 7)

Quoting this objection in the Synopsis to the *Meditations*, Descartes admits that he needs to justify the move from 'I am not aware of anything belonging to my essence except thought' to 'nothing in fact belongs to my essence except thought'. Yet, almost perversely, he apparently proceeds to repeat the same unsatisfactory move in the Second Meditation: "What is this 'I' that I know?," asks the meditator; "I am in the strict sense only a thing that thinks, that is, I am a mind or intelligence or intellect or reason" (*sum precise tantum res cogitans, id est mens, sive animus, sive intellectus, sive ratio,* AT VII 27: CSM II 18).

When he was asked about this passage some years later, by Gassendi, Descartes insisted that the qualifier 'only' (*tantum*) was supposed to go with 'in the strict sense' (*praecise*), not with 'a thing that thinks' (*res cogitans*). In other words, he did not mean to assert that he was *only* a thinking thing, and nothing else; the claim was the more modest one that he was 'in the strict sense only' a thinking thing (AT IXA 215: CSM II 276).[14] But what does this 'strict sense' come down to? Descartes cannot avoid admitting that, for all the meditator in the Second Meditation knows, the 'thinking thing' he is aware of might well be a corporeal being of some kind; his ability to doubt the existence of corporeal objects is quite compatible with the possibility that what is *doing* the doubting is after all, something essentially embodied.

In his reply to Gassendi, Descartes angrily insisted that he had acknowledged just this possibility in the Second Meditation: "I showed that by the words 'in the strict sense only' I did not mean an entire exclusion or negation, but only an abstraction from material things; for I said that in spite of this we are not sure that there is nothing corporeal in the soul, even though we do not recognise anything corporeal in it" (AT IXA 215: CSM II 276). This seems at least partly disingenuous. Admittedly, Descartes had in the Second Meditation raised the possibility that the material things he had imagined not to exist might be identical with the 'thinking thing' of which he was aware: '*fortassis contingit ut haec ipsa, quae suppono nihil esse . . . in rei veritate non differant ab eo me quem novi*' (AT VII 27: CSM II 18, lines 29–31). But although this possibility is initially left hanging in the air, by the end of the paragraph Descartes seems effectively to have ruled it out: no corporeal object which the

imagination can conceive is relevant to my awareness of myself, and hence 'the mind must be most carefully diverted from such things if it is to perceive its own nature as distinctly as possible' (AT VII 28: CSM II 19). Whatever Descartes later said to Gassendi, it is hard to avoid reading this passage as subtly insinuating that any attempt to identify the mind's nature with something material would be radically misconceived. If, however, we delete this insinuation, then all that Descartes' talk of a 'precise' or 'strict' way of speaking can logically boil down to is the unexciting assertion that the meditator can arrive at *some* kind of conception of himself as an isolated, disembodied doubter.

There seem to be two possible interpretations of what is going on here. On the uncharitable interpretation, Descartes initially just failed to see the flawed nature of the move from "I can doubt I have a body" to "the body is not essential to me," and, having boldly run this flag up the masthead in the *Discourse*, could not quite bring himself to haul it down and jettison it. On the more charitable interpretation, he is quite clear that his subjective awareness of himself as a disembodied doubter is no more than that – a piece of subjective awareness – and that all the work still remains to be done to establish that the conception so arrived at does indeed match the nature of reality. The more charitable version is hard to square with the passages in the Second Meditation already cited, and above all with the texts quoted above from the letter to Silhon and the *Discourse*, where no amount of varnish seems enough to cover the glaring paralogism. But the kinder view is supported by other passages, including one in as early a text as the *Regulae*, where Descartes makes a quite explicit distinction between subjective cognition and essential reality, and readily and frankly admits that "when we consider things in the order that corresponds to our awareness of them" (*in ordine ad cognitionem nostram*), our view of them may be different from what it would be if we were speaking of them "in accordance with how they exist in reality" (*prout re vera existunt*, AT X 418: CSM I 44).[15] So a defender of Descartes has some case for accepting the protestation in the *Synopsis* that, when he excluded body from his essence, Descartes did not mean to make the exclusion "in an order corresponding to the actual truth of the matter" (*in ordine ad ipsam rei veritatem*), but only in an order corresponding to his own perception (*in ordine and meam perceptionem*, AT VII 8: CSM II 7).

But even to interpret Descartes charitably in this respect is of course very far from vindicating his metaphysical arguments for dualism. The gap between subjective cognition and objective reality, once acknowledged, is not easily closed; and though Descartes does at least attempt to close it – most notably in the argument from divinely guaranteed clear and distinct perceptions in the Sixth Meditation – it is familiar ground, and was so even in the seventeenth century, that his argument is highly vulnerable. The most notorious pitfall is Arnauld's circle: The gap between subjective cognition and essential reality is bridged by proving God's existence; yet the proof itself depends on the reliability of just that subjective cognition which needs to be validated. But even *granting* the divinely underwritten reliability of the intellect, there is a second trap (which again Arnauld was the first to highlight): my ability clearly to perceive X apart from Y (e.g. mind apart from body) cannot, since my intellect is limited, rule out the possibility that there is a chain of necessary connections, *unperceived* by me, which would reveal that Y is after all essential to X.[16]

That Descartes' metaphysical manoeuvres fail to provide a plausible defence of the incorporeality thesis is hardly a new complaint. What is interesting is that Descartes' confidence in that thesis was entirely unshaken by the telling criticisms to which his arguments were repeatedly subjected, by Arnauld and many others.[17] It is almost as if he felt that, irrespective of whether his metaphysical demonstrations could be shored up, there were still solid, and quite independent considerations for insisting on the incorporeal nature of the mind. These considerations are hinted at in his earlier work on physiology and articulated with considerable force in the scientific section of the *Discourse*. It is to this quite distinct 'scientific' strand in Cartesian dualism that we must now turn.

DESCARTES' SCIENCE OF THE MIND: THE DISAPPEARING SOUL

In Descartes' early work on the nature of man, what is striking is not the use made of the term 'soul' but the extent to which appeals to the soul are declared to be redundant. A radical mechanistic reductionism pervades the *Traité de l'homme* composed in the early 1630s, and a whole range of human activities are ascribed to the

operations of a self-moving machine which, like a "clock or an artificial fountain or mill" (*horlorge, fontaine artificielle, moulin*), has the power (*la force*) to operate purely in accordance with its own internal principles, depending solely on the disposition of the relevant organs (*la disposition des organes*) (AT XI 120: CSM I 99). Descartes proudly, and provocatively, declares that it is not necessary to posit any "sensitive or vegetative soul" or other principle of life apart from the internal fire of the heart – a fire which has the same nature as the fires to be found elsewhere in inanimate objects: *il ne faut point . . . concevoir en elle aucune autre âme végétative, ni sensitive, ni aucun autre principe de mouvement et de vie que . . . la chaleur du feu qui brûle continuellement dans son coeur, et qui n'est point d'autre nature que tous les feux qui sont dans les corps inanimés* (AT XI 202: CSM I 108).

The list of functions to be explained in this way, without any reference to soul, is highly ambitious. It comprises:

> digestion of food, the beating of the heart and arteries, the nourishment and growth of the limbs, respiration, waking and sleeping, the reception by the external sense organs of light, sounds, smells, tastes, heat and other such qualities, the imprinting of ideas of these qualities in the organ of the 'common' sense and the imagination, the retention or stamping of these ideas in the memory, the internal movements of the appetites and passions, and finally the external movements of all the limbs which aptly follow (*suivrent à propos*) both the actions and objects presented to the senses and also the passions and impressions found in the memory. (ibid.)

The remarkable thing about this list is how far it goes beyond what we might think of as 'pure physiology'. What we declared to be capable of mechanistic explanation are not just functions belonging to the autonomic nervous system such as respiration and heartbeat, but, on the face of it at least, 'psychological' functions like sense perception and memory, internal sensations like fear and hunger, and even, apparently, voluntary actions such as running. When a sheep sees a wolf and runs away, Descartes was later incredulously asked, are we really supposed to believe that this can occur in the absence of any kind of "sensitive soul"? His answer was unequivocal: yes. And he went on to insist that, *in the case of humans too*, a mechanistic explanation was quite sufficient to explain even such waking actions as walking and singing, when they occur 'without

the mind attending to them' (*animo non advertente*, AT VII 230: CSM II 161).[18]

The last qualification is, of course, crucial. Where mental attention is involved, Descartes is clear that we must posit a separate 'rational soul' (*âme raisonable*) which is, by a special act of the creator, 'united' to the complex machinery of the human body (AT XI 143: CSM I 102). But though the soul has not quite vanished, its functions are very severely reduced in comparison with the role played by the *psyche* of the Aristotelians. It does not, for example, even function as the initiator of the physical movements: the traditional 'locomotive soul' drops out of the picture, and all that is left is for the *âme raisonable* to do is act like a fountain keeper (*fontenier*), surveying the flow of the waters (the 'animal spirts' of the body) and diverting them into this or that channel, without affecting the quantity of motion in the system as a whole (AT XI 131: CSM I 101).[19] Descartes' mechanistic reductionism is starkly eliminative: *entia non sunt multiplicanda* – wherever we can possibly dispense with the soul, we should.[20] The Cartesian soul, in short, is rather like the "God of the Gaps" of some present-day physicists – invoked only as a last resort, when the experimenter comes up against a phenomenon that baffles the explanatory powers of the scientist. In Descartes' case, the reason why he saw his science of man as unable ultimately to dispense with the soul is not made clear in the *Treatise on Man*, but emerges with great vividness in the *Discourse* – not in the fourth, metaphysical, section of that work, but in the fifth section, devoted to the physical world and the unfolding of the "laws of nature."

The main scientific argument for dualism, as presented in *Discourse* Part V, hinges on the intellectual capacities of man – not on *la pensée* in the wide sense which Descartes sometimes uses to cover the whole spectrum of consciousness including feeling and sensation,[21] but on the power to form concepts, and to express them in language: *composer un discours pour faire entendre les pensées* (cf. AT VI 57: CSM I 140). The "Chomskian" argument, as we may anachronistically but appropriately term it,[22] starts from the observation that a machine, or a *bête machine*, is essentially a stimulus–response device. You may be able to train a magpie to utter "words," as Descartes later wrote to the Marquess of Newcastle, but each word will be a fixed response to an external stimulus causing a given

change in the nervous system (AT IV 574: CSMK 303).[23] As Descartes put it in the *Discourse:*

> We can certainly conceive of a machine so constructed that it utters words (*paroles* . . . corresponding to . . . a change in its organs (e.g. if you touch it in one spot it asks what you want of it, and if you touch it in another spot it cries out that you are hurting it). But it is not conceivable that such a machine should produce arrangements of words so as to give an appropriately meaningful answer (*pour répondre au sens*) to whatever is said in its presence, as even the dullest of men can do. (AT VI 56: CSM I 140)

In short, the human language-user has the capacity to respond appropriately to an indefinite range of situations, and this capacity seems *toto caelo* different from anything that could be generated by a "look-up tree" or finite table correlating inputs with outputs. What is interesting about this celebrated Cartesian argument as it appears in the *Discourse* is that the insistence on the radical *limitations* of a mere machine immediately follows a paragraph which had invited the reader to reflect on the *power* of mechanical explanations. Descartes has just claimed that the purely mechanized operations of the brain and nervous system can, provided that they are sufficiently complex, explain a whole range of actions which might, to the unprejudiced eye, seem entirely beyond the scope of a mere machine. The purely physical processes of the animal spirits, and the mechanical processing of the *fantasie* or "corporeal imagination," can produce a rich array of behavior which is entirely "appropriate to the objects of its senses and internal passions" (*à propos des objets qui se presentent à ses sens et des passions qui sont en lui*). The skeptic is invited to consider just how complex the responses of ingeniously constructed man-made automata can be: if a physical artifact can exhibit such complexity of response, then why not accept that a purely physical body, 'made by the hand of God' can do even more? "This will not seem at all strange to those who . . . are prepared to regard the body as a machine (*consideront le corps comme une machine*) which, having been made by the hand of God (*ayant été faite des mains de Dieu*), is incomparably better ordered, and contains in itself far more remarkable movements than any machine that could be invented by man" (*est incomparablement mieux ordonée, et a en soi des movements plus admirables, qu'aucune de celles qui peuvent être inventées par les hommes,* AT VI 56: CSM I 139).

But now if this is right, if God has at his disposal minute physical mechanisms of such incomparable complexity, can we really know a priori that he could not construct, out of purely material structures, a thinking, talking machine – a human being? Descartes' answer – and here is the crux – is that we cannot absolutely rule this out. The appeal to the flexibility and scope of human linguistic capacity generates an argument whose conclusion has the status only of an overwhelming probability, not of an absolute certainty:

> Since reason is a universal instrument (*instrument universel*) which can be used in all kinds of situations, whereas [physical] organs need some particular disposition for each particular action, it is *morally impossible* (*moralement impossible*) for a machine to have enough different organs to make it act in all the contingencies of life in the way in which our reason makes us act. (AT VI 57: CSM I 140, emphasis supplied)

"Moral certainty" as Descartes later explained in the 1647 (French) edition of the *Principles of Philosophy*[24] is "certainty which is sufficient to regulate our behaviour, or which measures up to the certainty we have on matters relating to the conduct of life which we never normally doubt, though we know it is possible absolutely speaking that they may be false" (*bien que nous sachions qu'il se peut faire, absolument parlant, qu'elles soient fausses*) (Part IV, art. 205: AT IX 323: CSM I 290). Descartes' position is thus quite clear. His reflections on our uniquely human ability to respond to "all the contingencies of life" led him to believe that the 'universal instrument' of reason could not feasibly be realised in a purely physical set of structures; but the possibility of such a physical realization is one that, good scientist that he is, he is not prepared absolutely to rule out.

The sense in which Descartes' 'scientific' stance on the nature of the mind is open to empirical evidence now begins to emerge. What makes a physical realization of the 'instrument of reason' hard for him to envisage is, at least partly, a matter of *number and size* – of how many structures of the appropriate kind could be packed into a given part of the body. Descartes made no secret of his enthusiasm for anatomical dissection as the key to understanding the minute structures of the nervous system and other bodily organs.[25] But what such investigations established, so he believed, was the essential underlying *simplicity* of those structures. Everything that went on in heart and brain, nerves, muscles and 'animal spirits' manifested, at the

level of observation that was available to him, nothing more than elementary "push and pull" operations – operations not in principle any different from the simple workings of cogs and levers and pumps and whirlpools that could be readily inspected in the ordinary macro world of "medium-sized hardware." Everything happened *selon les règles des méchaniques qui sont les mêmes que celles de la nature* (AT VI 54: CSM I 139).[26] And apparently Descartes could not envisage the brain or nervous system as being capable of accommodating enough mechanisms of the requisite simplicity to generate enough responses of the complexity needed to constitute genuine thought or linguistic behavior. Yet this in turn prompts the in one way absurdly hypothetical but in another way curiously illuminating question: would Descartes have maintained his stance on the incorporeality of the mind had he been alive today? The argument in the *Discourse* hinges on the practical impossibility of a physical mechanism possessing a sufficiently large number of different parts (*assez de divers organes*) to facilitate the indefinite range of human responses to "all the contingencies of life" (AT VI 57). Such an argument, it seems, could hardly survive the modern discovery of the staggering structural richness of the microstructure of cerebral cortex, comprised as we now know, of over ten billion neural connections. Indeed, at a simpler level, it is not even clear that it could survive an appeal to modern chess-playing machines, capable, though composed of nothing more than plastic and metal, of responding coherently and appropriately to an indefinite range of moves, in ways which are often new and surprizing, often capable of outwitting human opponents, and most crucial of all, incapable of being predicted in advance even by their programmers.

The purpose of these appeals to modern science is not pointlessly to berate Descartes for a failure to take account of evidence he could not possibly have dreamt of, but simply to underline the philosophical status of his scientific arguments for dualism. There is, however, a more apposite criticism that can be made against Descartes' arguments, namely that, even on his own terms, and within the limitations of his own scientific methodology, he seems to have been a trifle cavalier about the likely limitations of 'mere matter'. Sometimes he seems content to rest his case on a simple appeal to the difficulty of seeing how mere extended stuff could generate thought. "When I examine the nature of body" he wrote to one critic, "I just

do not find anything in it which savours of thought" (*nihil prorsus in ea reperio quod redoleat cogitationem*, AT VII 227: CSM II 160). In taking this "swift and easy" line with his critics, Descartes seems to verge on inconsistency with his scientific procedure elsewhere; for he certainly would not have accepted any protestations of his scholastic opponents to the effect that when they examined the nature of matter they could find nothing in it which savored of fire, or of gravity, or of life. In all these three latter cases, Descartes' reply would have been brusque: what matters, he would surely have insisted, is not what anyone can easily see straight off as following from the definition of 'extended stuff' but what can ultimately be shown to arise out of complex configurations of that extended stuff, when it is divided into indefinitely small particles of various sizes and shapes, all moving at various speeds and in different directions (cf. *Principles*, Part II, art. 64 and Part IV, art. 187).

Descartes, in short, cannot have it both ways. His general reductionist program insists that apparently mysterious, seemingly *sui generis* phenomena like fire or gravity, or even life itself, can all be explained if we are prepared to go deeply enough into the purely physical mechanisms operating at the micro level. Yet having taken that stance, he is not in a very easy position to insist on the impotence of "mere" extended stuff to generate cognition and speech along similar lines. The point is reinforced when one remembers that many of the standard explanations of Descartes' physics posit (though we have to take their existence on trust) micro events of near inconceivable minuteness. Consider, for example, the 'subtle matter' (matter composed of very tiny fast moving particles) invoked to explain gravity (the subtle matter pushing terrestrial particles toward the center of the earth; cf. *Principles* Part IV, art. 23). When one of Descartes' correspondents ventured to identify this subtle matter with the "particles of dust we see flying in the air," Descartes scornfully retorted that this was a complete misunderstanding: the particles of subtle matter were utterly undetectable by the senses, smaller by a whole order of magnitude even than invisible particles of air, which are in turn far smaller than tiny dust particles (letter to Morin, 12 September 1638: AT II 373: CSMK 123). Yet again, this does not sit happily with the scientific claim that the size of the brain does not allow for enough microstructures to generate the richly varied responses of human behavior.

Despite these occasional overswift manoeuvres, the general thrust of Descartes' scientific work on the human nervous system points unmistakably in the direction of the *homme-machine* envisaged by Julian de la Mettrie in the following century, and beyond that to the "neurophilosophy" of the mind, which attracts wide support in our own day.[27] Once Descartes had taken the vital step of assigning so many of the traditional functions of the 'soul' to the minute physical mechanisms of the nervous system, it was only a matter of time before Western science would go all the way, and make even the residual *âme raisonable* redundant. Although it is too early to say whether the modern research program of neurophilosophy will succeed in all its aims, what can be said is that Descartes himself unequivocally and undogmatically allowed that the question of the limits of physics was sensitive to empirical evidence. Whether or not cognition was beyond the powers of a corporeal machine was a matter for scientific argument. The probabilities in favour of a specially created soul are, on the arguments given in *Discourse* Part V, overwhelmingly strong; but there is no logically watertight guarantee.

CONCLUSION

Of the triad of considerations, theological, metaphysical and scientific, which motivated Descartes' adherence to the thesis of the incorporeality of the mind, it would be difficult or impossible to single out any one as having the primacy in structuring his own personal convictions.[28] If his dying words *"ça mon âme; il faut partir"* are reported accurately[29] he ended his days without wavering in his devout belief that the essential part of him – *ce moi, c'est-à-dire l'âme par laquelle je suis ce que je suis* (AT VI 33) – would continue its existence in a future life, unimpeded by the confining prison house of the body. And though he vacillated on whether to advertize to the world his claim to demonstrate the theological doctrine of personal immortality, he undoubtedly saw his dualism as providing better support for that doctrine than did the Aristotelianism of his predecessors. On the metaphysical front, his attempts to demonstrate the distinctness of soul from body were widely rejected as invalid even in his own day, bedeviled as they were by the central flaw in his method – its failure to find a convincing route outward from the inner prison of subjective cogni-

tion to the reliable knowledge of objective reality. Lastly, when he approached the issue from the outside, from his investigations of animal and human behavior, he was driven by a unificatory and reductionist vision, which led him progressively to banish the soul from science; when it appears, the soul is "tacked on" at the end of the story[30] invoked to account for the phenomena of thought and language that appeared to Descartes, for empirical reasons, radically resistant to mechanistic explanation. Whether that resistance can be overcome by the theoretically more sophisticated and empirically far richer resources of modern neurophysiology remains to be seen. As for Descartes himself, he was no doubt able to take satisfaction from the thought that ultimately the demands of faith, of demonstrative reason and of scientific inquiry all seemed to pull in the same direction – toward the conclusion that the soul of man is entirely and truly distinct from his body: *mon âme est entièrement et véritablement distincte de mon corps.*[31]

NOTES

1 Cf. Synopsis to *Meditations: "l' esprit ou l'âme de l'homme (ce que je ne distingue point)."* (AT IX 10: CSM II 10n., emphasis supplied). This assertion of the interchangeability of the terms "mind" and "soul" in Cartesian metaphysics appears in the 1647 French version of the *Meditations.* The original 1641 Latin text refers simply to the mind (*mens,* AT VII 14). Cf. also the French and Latin versions of the title of Meditation Six.

2 The term "real" (*realis*) is much more precise in Descartes than is suggested by the looser and vaguer connotations of the modern English term "real": "strictly speaking a real distinction exists only between two or more substances" (*Principles* Part I, art. 60: AT VIIIA 28: CSM I 213).

3 This seems to be the predominant picture both in the Jewish and Christian scriptures. Cf. Job 19:25: "though worms destroy this body, yet *in the flesh* shall I see God": and I Corinthians 16:42–4: "So also is the resurrection of the dead. It is sown in corruption; it is raised in incorruption. . . . It is sown a biological body (*soma psychicon*) and it is raised a spiritual body (*soma pneumation*)". The Nicene Creed (A.D. 325) affirms the "resurrection of the body." However, the doctrine of purgatory that arose early in Christian thought apparently does imply an intermediate state in which wholly bodiless souls await the resurrection. Such a soul, however, could not, according to Aquinas, be a "complete substance" (*Summa Theologiae* Ia 75.4 and Ia 118.2. See also Suarez, *Metaphysical*

Disputations Disp. 33, Sect. 1, art. 11: "anima etiamsi sit separata . . . est pars . . . essentialis, habetque incompletam essentiam . . . et ideo semper est substantia incompleta," cited in Gilson, *Index Scolastico-Cartésien*, p. 278. See also Swinburne, *The Evolution of the Soul*, p. 311.

4 Aristotle distinguished five functions – vegetative, sensory, appetitive, locomotive, and intellectual (*De Anima*, II 3); these were in turn incorporated into the Thomist system as the *quinque genera potentiarum animae*; cf. *Summa Theologiae* I 78.1, and Gilson, *Index Scolastico-Cartésien*, pp. 12–15.

5 "Concurrence" is the continuously exercised power of God the preserver, without which (on the orthodox doctrine of creation and preservation that Descartes followed) all things would collapse into nothingness. Cf. AT VII 49: CSM II 33.

6 "I do not take upon myself to try to use the power of human reason to settle any of these matters which depend on the free will of God" (AT VII 153: CSM II 109).

7 The claim in the subtitle of the first (1641) edition of the *Meditations* – "in qua . . . animae immortalitas demonstratur" – was dropped in the second edition of 1642; cf. letter to Mersenne of 24 December 1640: AT III 266: CSMK 163. The most marked retreat from the demonstrability claim occurs in the letter to Elizabeth of 3 November 1645: "je confesse que, par la seule raison naturelle nous pouvons bien faire beaucoup de conjectures . . . et avoir de belles espérances, mais non point aucune assurance" (AT IV 333: CSMK 277). For Descartes' disinclination to encroach on the province of the theologians, see esp. AT V 176, translated in Cottingham, (ed.), *Descartes' Conversation with Burman*, pp. 46 and 115f.

8 For Aristotle's "active intellect," see *De Anima* III 5. Averröes, the great Muslim commentator on Aristotle, took it that after the death of the body, human souls lost any individuality and were merged into a universal spirit. The Lateran council of 1513 condemned the Averröean heresy; cf. AT VII 3: CSM II 4.

9 In the "Coimbran" commentaries on the *De Anima* published by a group of Jesuit writers in 1598, there is a hostile reference to "certain recent philosophers who assert that since the rational soul is the form of the body, its immortality rests on faith alone, because, so they claim, no form of a body can be shown by philosophical principles to have the power to exist outside matter." (*Commentarii in tres libros de Anima Aristolelis* Bk. II, ch. 1, qu. 6, art. 2; cited in Gilson, *Index Scolastico-Cartésien*, p. 142.)

10 In the letter to Plempius for Fromondus of 3 October 1637, Descartes explicitly contrasts his views on the soul with those of the scholastics and suggests that he can avoid many of the theological difficulties that

beset the latter; see esp. AT I 414ff: CSMK 62f. See also the letter to Regius of January 1642 (AT III 503: CSMK 207–8). For the sincerity of Descartes' religious commitments, cf. letter to Mersenne of March 1642 (AT III 543: CSMK 210).

11 *Speciales modi cogitandi:* Sixth Meditation, AT VII 78: CSM II 54. See further, Cottingham, "Cartesian trialism," 226ff. Post-mortem consciousness, devoid of these "special modes" would, it seems, be a thin and meager affair – at least as far as personal individuality is concerned. Cf. the remarks on "decorporealised immortality" in C. Wilson *Leibniz's Metaphysics,* p. 197; Wilson suggests that Descartes' concern for the prolonging of corporeal life may have been motivated by an implicit realization of the meager quality of existence realizable by a pure incorporeal intellect. For Leibniz's own criticisms of Cartesian immortality, see Supplementary Texts, no. 16, in Martin and Brown (eds.), *Leibniz, Discourse on Metaphysics,* p. 127.

12 See Louis de la Forge, *Traité de l'âme humaine,* cited in Watson, "Descartes and Cartesianism," p. 593. For the problem of individuating angels, cf. Aquinas, *Summa Theologiae* I, 50.4. See also AT V 176, and Cottingham (ed.), *Descartes' Conversation with Burman,* 19 and 84.

13 That the addressee of this letter is Silhon is a conjecture of Adam, rendered plausible by the fact that Silhon had written two treatises on the immortality of the soul; cf. AT I 352.

14 Gassendi's criticisms of this passage from the Second Meditation were published in his *Disquisitio Metaphysica* in 1644; Descartes' reply occurs in the letter to Clerselier of 12 January 1646, which was reprinted in the French translation of the *Meditations with Objections and Replies,* published in 1647. See further CSM II 268 n.

15 "We are concerned here with things only in so far as they are perceived by the intellect" (*hic de rebus non agentes nisi quantum ab intellectu percipuntur*), loc. cit. For more on the significance of Descartes' arguments in this part of the *Regulae,* see above, Chapter 4.

16 For Arnauld's circle, see Fourth Objections: AT VII 214: CSM II 150. For his criticism of the argument from clear and distinct perception, see AT VII 201f: CSM II 141f. For an analysis of this critique, see Cottingham, *Descartes,* pp. 113ff.

17 Among the many arguments that Descartes seems to have been able blithely to ignore, see esp. Gassendi's arguments in the Fifth Objections: AT VII 334ff: CSM II 232ff; cf. also the comments of "Hyperaspistes" in the letter of August 1641: AT III 423f: CSMK 189f. The criticisms that did succeed in worrying Descartes concern not the incorporeality thesis itself, but the explanation of the soul's union and interaction with the body. See below, note 31.

18 For more on the relation between pyschology and physiology in Descartes' thought, see Chapter 11.

19 This, at any rate, is one possible reading of the (somewhat vague and schematic) fountain keeper passage. Cf. also *Passions of the Soul*, art. 12: there is a continuous flow of animal spirits from brain to muscles, but the activity of the soul may "cause more to flow into some muscles than others" (AT XI 337: CSM I 332). As far as I am aware, Descartes never *explicitly* asserts that the soul can change the direction, but not the overall quantity, of bodily motions, though later Cartesians certainly made such a claim on his behalf. The claim was keenly criticized by Leibniz, who aptly insisted that any change in direction must imply a change in overall momentum: to say that the soul can at least change the *direction* of the animal spirits is "no less inexplicable and contrary to the laws of nature" than asserting that it could directly increase the speed or force of flow (*Philosophischen Schriften*, ed. Gerhardt, vol. VI, p. 540; translated in Loemker, *Philosophical Papers and Letters*, p. 587).

20 For Descartes' "occamism," cf. *Meteorology:* "it seems to me that my arguments must be more acceptable in so far as I can make them depend on fewer things" (AT VI 239: CSM II 173 n).

21 For Descartes' use of *la pensée*, and the extent to which his "wide" employment of this term has been overstressed by commentators, see Cottingham, "Descartes on thought," 208ff.

22 Cf. Chomsky, *Language and Mind*.

23 Descartes does, however, add the curious comment that the word so produced will be the "expression of one of the bird's passions (e.g., the hope of eating)." For Descartes' not entirely consistent stance on whether animals have, if not thought, then at least sensation, see Cottingham, "A brute to the brutes? Descartes' treatment of animals," 551ff.

24 This comment is not to be found in the original 1644 Latin text; like many of the significant additions and clarifications that appear in the 1647 French translation of the *Principles*, it is almost certainly supplied by Descartes himself, not by the translator, Picot. See further CSM I 177f.

25 In a letter to Mersenne of 20 February 1639, Descartes' claims that his anatomical investigations had been a major interest for at least eleven years: "c'est un exercise où je me suis souvent occupé depuis onze ans, et je crois qu'il n'y a guère médecin qui ait regardé de si près que moi" (AT II 525: CSMK 134). For a general account of Descartes work in this area, see Lindeboom, *Descartes and Medicine*, ch. 3 (Lindeboom, perhaps rightly, suspects that, despite the boast to Mersenne, Descartes' empirical researches were in actual fact conducted at a fairly unsystematic, not to say amateurish, level.)

26 See further Descartes' comments in the *Description of the Human Body:* AT XI 224ff: CSM I 314ff. The "simplicist" assumption (or prejudice?) that informs so much of Descartes' scientific methodology is stated most explicitly in a letter to Huygens of 10 Octo[illegible] 1642: "la nature ne se sert que de moyens qui sont fort simples" (AT III 797: CSMK 215). See further Chapter 9, below.

27 La Mettrie's *L'Homme machine* appeared in 1747 [illegible]r modern physicalist approaches to the mind, cf. Churchland, *Neurophilosophy,* pt. 2.

28 See, however, the celebrated study of Henri Gouhier, *La Pensée religieuse de Descartes,* which regards Descartes' religious faith as the mainspring of his metaphysics: "il partit d'un si bon pas parce qu' une foi profonde avait écarté de son âme toute inquiétude (p. 314).

29 There are various versions. The actual phrase, according to Clerselier's account, was rather more elaborate: "ça mon âme, il y a long temps que tu es captive; voici l'heure que tu dois sortir de prison et quitter l'embaras de ce cors" (AT V 482).

30 The *âme raisonable* is introduced right at the end, both in the order of exposition in the *Traité de l'homme* (AT XI 131: CSM I 101) and in the summary recapitulation presented in *Discourse* Part V (AT VI 59: CSM I 141).

31 Sixth Meditation: AT IX 62: CSM II 54. The Latin text, as often, avoids the word "soul" and refers instead simply to the "thinking thing" that is me: "quatenus sum tantum res cogitans . . . certum est me a corpore meo revera esse distinctum" (AT VII 78). In the later psychology of Descartes (especially in the letters to Elizabeth of 21 May and 28 June 1643), there is a subtle and important shift of focus away from the distinctness of soul and body and toward the notion of their "substantial union" (AT III 665ff and 691ff: CSMK 218 and 226). The upshot of these maneuvers (which are the subject for another paper) does not detract from the incorporeality of pure thought or the "rational soul" in which it resides. What Descartes does do, however, is systematically to develop hints in his earlier metaphysics that the phenomena of "feeling," "sensation," and "imagination" cannot straightforwardly be assigned to soul *simpliciter* but should be regarded as properties of that mysterious soul–body hybrid that is the human being. Some of the issues that arise here are examined in Cottingham, *Descartes* pp. 127ff. One important implication of assigning all sensory experience to the mind–body union is that the post-mortem consciousness of Descartes' immortal soul will, it seems, be confined to "pure," abstract thought; cf. above, pp. 240–1. I am grateful to Stuart Brown, Gary Hatfield, Pauline Phemister, David Scott, and Roger Woolhouse for helpful comments on an earlier draft of this chapter.