USE OF THESES

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THE CARTESIAN REVOLUTION

A Study of Descartes' Meditations

by

Erica Lucy Roberts

A thesis submitted for the degree of Doctor of Philosophy
of the Australian National University, July 1991
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Declaration

This thesis is my own work. All sources used have been acknowledged.

[Signature]

Erica Lucy Roberts

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ABSTRACT

In this study I focus on Descartes' Meditations and aim to show its revolutionary importance in the history of philosophy. I argue that its significance cannot be understood by abstracting it from its historical context, nor by regarding the pre-Cartesian Christian medieval period as devoid of systematic philosophy or science. To the contrary, Descartes' philosophical strategy cannot be understood except as involving the destruction (and revolutionary reconstruction) of the classical pre-Cartesian philosophical outlook. And, ironically, such was Descartes' success, that the pre-Cartesian period has increasingly (post-Descartes) come to be regarded as a philosophical 'dark age'. Thus have the arguments of Descartes' Meditations been rendered problematic, with the consequence that it has become difficult to see why they should be regarded as philosophically significant.

In Chapter One I examine briefly Anglo-American interpretive approaches to the Meditations and indicate something of the way in which Descartes' approach differed from that of his predecessors. I then consider (in Chapters Two - Four) Descartes' use of skeptical argument and show that, construed as an attack on the Thomist and neo-Platonist concepts of sense and intellectual perception, they destroy the realist foundations of classical pre-Cartesian epistemology and science.
I argue that the Cartesian reconstruction of philosophy and science begins with the introduction of the notion of a self-defining subject - a knowing subject whose existence is demonstrated, and essence defined, independent of the cosmic order. By this means, Descartes initiated a major 'paradigm shift'. This, *inter alia*, called for a transformation in the notion of a priori necessity, and resulted in a philosophical shift away from the Christian creature/Creator and Greek Form/matter distinction and their replacement by the characteristically modern mind/body and/or mind-dependent/independent distinction(s).

Thus situated, I show that the problem of the so-called Cartesian Circle is dissolved. Moreover, I argue that Descartes' proof of God's existence must be reassessed, firstly, in the light of the recognition that he has available the same response to Hume's attack on the necessity of a cause as that subsequently developed by Kant and, secondly, in the light of the uniquely Christian transformation of the classical Greek conceptions of finitude and infinitude. For this transformation not only underpins the move from the closed world of classical Greek science to the infinite universe of modern science, but provides a genealogy for the concept of God (= the Infinite) employed by Descartes to re-establish a realist foundation for science.
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Chapter One

THE CARTESIAN PROJECT

The Interpretive Context

The emergence of Cartesian philosophy in the seventeenth century marked a major turning point in the history of science and philosophy. Descartes himself believed that it was given to him to put forward a vision of a 'completely new science'; in effect, to revolutionize science and philosophy. And notwithstanding the magnitude of the project, there can be little doubt that he was successful. By the end of the seventeenth century 'Cartesianism' was nearly synonymous with 'science' and the preceding traditions in science and philosophy had been effectively overturned and destroyed. Indeed, so total was their destruction and eclipse that the period separating Descartes from Aristotle came increasingly to be regarded as a dark age - or an age devoid of substantial philosophic or scientific significance.¹

Yet although the literature surrounding Cartesian philosophy is ever expanding it has, somewhat paradoxically, become increasingly difficult to understand why Cartesian philosophy should merit a pre-eminent place in the history of philosophy and science. As far as science is concerned, it is in the work of Newton, Galileo or Copernicus that are to be discovered the 'breakthroughs'
'paradigm shifts' which heralded the emergence of modern science. And in philosophy, Descartes' work is more often than not presented as so shot through with basic philosophical errors that it is, to say the least, difficult to understand how or why it ever could have proved of importance. Indeed, so serious are the errors commonly ascribed to Cartesian philosophy that it has come to seem as if the major task of Cartesian scholarship is to excuse them - to explain why or how they came to be committed.

There is thus some tension in much of the literature surrounding Cartesian philosophy. On the one hand, the industry of Cartesian scholarship attests to Descartes' philosophical stature but, on the other hand, the shortcomings attributed to work are such as to suggest that it can hardly be regarded as that of a great philosopher. Nowhere has this tension been more apparent than in the so-called analytic tradition in Anglo-American Cartesian scholarship - notably represented by such writers as Bernard Williams, Anthony Kenny, Edwin Curley and Margaret Wilson (to name but a few). For although there is considerable dispute concerning the precise nature of the problems inherent in Cartesian philosophy, there is overwhelming agreement that it is very seriously and obviously problematic.

This tradition, it is true, has generally favoured an ahistorical approach to the history of philosophy and has
adopted the view that, like great art, great philosophy transcends its historicity. Thus it is held that the job of the philosopher (as distinct from that of the historian) is to distinguish between the (historically conditioned) 'clothes' in which the philosophies of the past are presented, and the substantive (ahistorical) content of the philosophies themselves. Although usually implicit, this approach is made explicit by Bernard Williams who, in the preface to his book *Descartes*, distinguishes between the history of ideas and the history of philosophy\(^3\). The former, he represents as an essentially historical attempt to portray the past as it actually was, whereas the latter involves an attempt to rationally reconstruct (in an ahistorical way) the philosophies of the past. And thus reconstructed, the philosophies of the past, he suggests, can be assimilated into a contemporary philosophical context and criticised in the light of contemporary philosophical thought. Yet while there is much to be said for this essentially anti-relativist approach which has been characteristic of Anglo-American Cartesian scholarship, it carries major problems. For the history of philosophy must, as Williams points out\(^4\), constitute its object by abstracting the strictly philosophical content of past philosophies from their historically conditioned mode of presentation. And putting aside for the moment the question of whether it is possible thus to rationally reconstruct the arguments of past philosophers without thereby distorting them, it is
not clear by what criteria we could judge such a task adequately executed. For our own philosophical positions, concerns and idioms are themselves historically conditioned; contemporary philosophy no more transcends its historicity than does that of the past. Thus, although we might re-present philosophies of the past in a contemporary idiom, this does not necessarily equate with an ahistorical rational reconstruction of such philosophies. For it may be that, in thus re-presenting the arguments of philosophers of the past, we mistakenly present them as if they bear on contemporary, historically conditioned, philosophical controversies.

This point, or something very like it, has been made by Marjorie Grene who argues that, precisely by assimilating "Descartes' arguments so thoroughly to the context of twentieth-century controversies", we remain so caught in the narrowness of our own perspectives "that the real Descartes is simply left aside altogether". Thus Grene suggests that if we would recover the 'real' Descartes, we must similarly recover the historical context in which he wrote. In a situation such as this, the publication of the collection *Essays on Descartes' Meditations* edited by Amelie Rorty, seems both timely and appropriate. For this collection differs from earlier collections in that it systematically attempts to throw light on Cartesian philosophy by locating it within its own historical context - namely, a context dominated by religious dogmas and Church authority. And in thus situating Cartesian
philosophy, an explanation emerges as to why,
notwithstanding the acknowledged serious philosophical
shortcomings of his work, Descartes is properly regarded as
the 'founder of modern philosophy'.

For with this collection, Rorty puts forward the view
that the importance of Descartes' work is a function, not
of its 'objective' excellence but, rather, of its
publication - not alone - but in the context of
unexpurgated correspondence "of a group of debaters
animated by mutual respect". With the publication of this
material, Rorty claims, philosophy emerged into the public
domain - a domain previously dominated by prejudice and
religiosity, and in which no place for philosophical debate
was provided. Thus she maintains:

In truth, then, the Meditations in its final printed
form moves us from a world of prefaces addressed to
doctors of divinity to a world defined as a community
of philosophers and scholars. The meditator's
reflective self-transformation from a confused
believer to a rational scientific inquirer provides
the transition between these two worlds.

On the picture thus developed, Descartes is properly
described as the 'founder of modern philosophy' just
because it was he who ushered philosophy into the public
domain.

Historical evidence relating to the repression by the
Church of those whose views did not accord with Christian
dogma, lends its considerable support to this view.
Moreover, it accords well with, and is a natural outcome of, an interpretation of Cartesian philosophy as an essentially personal and journey from pre-philosophical common sense to the development of philosophical approach or outlook. And thus construed, we are able not only to understand, but to excuse and forgive Descartes his mistakes as those of a naive and beginning philosopher whilst, at the same time, affirming the historical importance of his work.

However, despite its manifest explanatory power, this model is not without its problems. For it accepts, unreflectively, the view that the pre-Cartesian medieval Christian period can be dismissed as devoid of philosophy or science properly so-called. Yet notwithstanding the fact that, following the emergence of 'Cartesianism' such a view gained considerable popular parlance, it is manifestly at odds with the level of philosophical sophistication evident in the debate between Descartes and his correspondents. Furthermore, the work of scholars of medieval philosophy (such as, for example, Frederick Copleston or Etienne Gilson) makes it quite apparent that the medieval Christian period was one of considerable philosophical activity. Indeed, far from the Church's being hostile to philosophy, it was under the aegis of the Church that the philosophy of Plato and Aristotle was revived in pre-Cartesian Christian Europe. Here we can think of Augustine's development of Platonic thought and the emergence of Christian neo-Platonism. Equally, we can
think of the work of St Thomas Aquinas and his critical development and adoption of basically Aristotelian structures in philosophy. Despite their sanctification, the work of these Christian thinkers was certainly not without its critics, and the history of pre-Cartesian Christian philosophy is not without lively and sophisticated philosophical debate.

Of course it is true that, although pre-Cartesian Christian Europe developed, transformed, and worked through the philosophy of Plato and Aristotle, it never really freed itself from the basic structures of classical Greek thought. And for this reason, it is not entirely wrong to dismiss the period as lacking in substantive philosophical interest. However, while it is one thing to argue that the period was devoid of original, foundational and architectonic philosophy, it is another altogether to suggest that it can be dismissed as philosophically unsophisticated and naive. Yet nothing less than such a dismissal is required if Descartes' status as the founder of modern philosophy is held to rest, not so much on the content of his philosophy, as on its publication. There is thus good historical ground for rejecting the view that Descartes' philosophical stature rests, ultimately, on an absence of philosophical debate in pre-Cartesian Christian Europe and, correspondingly, that this provides some explanation of the shortcomings of his philosophy.
In a context such as this, it is not at all clear how we can intelligibly account for Descartes' stature as the founder of modern philosophy. Yet such is the aim of this study. For in the following, my aim is to show that, precisely by considering Cartesian philosophy – specifically the Meditations – in its historical and philosophical context, it is apparent that major philosophical problems commonly associated with its exegesis are ill-founded and generated by a misunderstanding of Cartesian philosophy. The requirement is simply that we take seriously Descartes' revolutionary purpose and reputation. For, as we will see, Cartesian philosophy did not arise from a philosophical or scientific vacuum. But unlike his predecessors, Descartes' aim was not merely to criticise, but to overturn and replace the basically Platonic and Aristotelian structures incorporated in pre-Cartesian Christian philosophy. And such was Descartes' success, that it is often appears as if the preceding period can be dismissed as a philosophical 'dark age'. Accordingly, the Cartesian Meditations has come to be regarded as if it represents an essentially personal, albeit historically significant, journey from pre-philosophic common sense to a philosophical approach. However, I will argue, this view is mistaken. For I will show that not only is there nothing naive about Cartesian philosophy, but that its faults are not such as to demand of us philosophical charity of the sort extended to a beginning philosopher. For viewed in its context, it emerges as the agent of a revolution in science and
philosophy which has changed the very framework and patterns of our thinking. And by recognizing how this transformation was achieved, we are in a position not only to understand the nature of Descartes' contribution to the philosophical debate but, no less importantly, to achieve an enhanced reflective appreciation of our own philosophical situation - and thus, perhaps, in some sense transcend it.

In this study I focus quite specifically on Descartes' *Meditations*. For in this work Descartes' revolutionary strategy is most clearly apparent. I will begin with the assumption that although its understanding makes no demand on our philosophical charity, it does demand of us some familiarity with the basic structures of the pre-Cartesian traditions in science and philosophy. And this, in just the same way that an understanding of any revolutionary process necessarily involves an understanding of the (pre-existing) system which corresponds, in some important respect, with the new system generated in and by the revolutionary process. Thus any account of, say, a political or social revolution paradigmatically involves an account of the relevant pre-revolutionary political or social state of affairs. And, as we will see, in grasping the revolutionary strategy of the Cartesian *Meditations*, we can thereby recognize both the historical and philosophical ground upon which Descartes is properly considered both a great and influential thinker. However, treated in abstraction from the pre-existing systems in science and
philosophy, Cartesian philosophy is deprived of its revolutionary significance; its sense and coherence is lost and, thus distorted, its historical and philosophical significance is inevitably diminished.

'Science': The Transformation of a Concept

It is, however, no easy matter to render intelligible the pre-Cartesian concepts of 'science' and 'philosophy'. For precisely as a result of that revolutionary transformation here at issue, our concept of what is, and is not, properly counted as 'science' or 'philosophy' has undergone a radical reformulation and restructuring. Thus, caught within the framework of post-Cartesian thought, it appears to us that the medieval Christian period was a period devoid of science or philosophy properly so-called. To understand the nature of the Cartesian revolution in science and philosophy we must therefore transcend our post-Cartesian framework and patterns of thought and recover an understanding of those characteristic of the pre-Cartesian medieval period.

A useful starting point is provided by Copleston when he says:

In the Middle Ages theology and philosophy were universally regarded as 'sciences'; the great figures in university life were the theologians and philosophers; it was they who in general estimation were the possessors of knowledge. In the course of time, however, scientific knowledge in the modern sense has come to be regarded as the norm or standard of knowledge; and in many countries neither philosophers nor theologians would be commonly
regarded as possessing 'knowledge' in the sense in which scientists are thought to possess it.10

The claim that theology and philosophy were universally regarded as 'sciences' is uncontentious. And since neither theology nor philosophy are now generally accepted as 'sciences' (at least in the English speaking world), it is apparent that the concept of 'science' has undergone a radical transformation. But the question which concerns us here is the precise nature of this transformation.

The 'Science' of Theology

By way of sketching an answer to this question, I want to briefly examine the case of theology. For, unlike philosophy, theology has remained substantially unchanged throughout the periods here in question. And by understanding why, despite this, theology once was, but now is not, regarded as 'science', we can begin to make some significant headway in understanding the nature of the conceptual transformation here in question.

The claim of theology to be regarded as a science, together with the reason it cannot today be so regarded, is clearly brought out by the twentieth century theologian, Karl Barth. For Barth claims, firstly, that, like other sciences, theology has a more or less definite object of knowledge, a self-consistent methodology and accepts the demand for accountability. He says:
(i) Like all the other so-called sciences, it is a human effort after a definite object of knowledge.
(ii) Like all the other so-called sciences, it follows a definite and self-consistent path of knowledge.
(iii) Like all the other sciences, it is in the position of being accountable for this path to everyone - everyone that is, who is capable of effort after this object and therefore of following this path.

Yet while these reasons were sufficient for theology to be counted as a 'science' in the context of pre-Cartesian thought, they are not thus sufficient now. For theology is positively disqualified from being counted as a 'science' in the modern sense because it cannot accept the methodology of modern science. Not only are its 'rules of evidence' incommensurable with those of modern science but, crucially in this context, it cannot accept the principle of non-contradiction as a basic canon of measurement. And by understanding why this is so, we are brought to the key distinction between the pre-and post-Cartesian concepts of science.

For theology cannot both remain true to its object and submit itself to the methodology or basic canons of measurement of modern science. This is because for theology, the object of knowledge is the free action of God (or something of that sort). And it is a fundamental question for theology whether the free action of God is constrained by the principle of non-contradiction (or, indeed, any other principle of logic or of reason). This being so, theology cannot accept the principle of non-contradiction as a basic canon of measurement without
thereby pre-empting the answer to what is perhaps its most fundamental problem. Accordingly the principle of non-contradiction can be no more than a postulate for theology. As Barth puts it, "while theology will not assert the irremovability of contradictions, the postulate of non-contradiction is acceptable to theology only upon this very limited interpretation".

It is clear, then, that in order to remain true to its object theology must resist its incorporation into modern science. Equally, in order to remain true to its methodology, modern science must reject the claim of theology to be considered a 'science'.

Pre-Cartesian and Post-Cartesian Concepts of 'Science'

The crucial point I want to highlight here is that, like the other pre-Cartesian 'sciences', the method appropriate to the 'science' of theology is determined by the nature of its intentional object. That is, in the pre-Cartesian context the methodology appropriate to any 'science' was considered secondary to, and determined by, the nature of the object of the particular 'science' in question. Here, the contrast with modern science is clear. For in modern science the reverse is the case -- the object of knowledge is secondary to the methodology. Thus, in modern science, the methodology is the tie which binds together the various disciplines and which ensures the development of a single coherent cosmology or world view. However, lacking any
such binding tie, the different 'sciences' of medieval Christian Europe offered different and competing world views. For this reason, they cannot be thought of in terms analogous to the different disciplines of modern science. And it is thus that when we think of the various 'sciences' of medieval Christian Europe we must think, not in terms of distinctions of the sort existing between, say, physics and biology, but, first and foremost, in terms of the distinctions between the Aristotelian and Platonist traditions in science.

Pre-Cartesian 'Science'

For although it was held in common that the canons of scientific measurement must be determined by the intentional object of the particular 'science' in question, the fundamental issue which divided the major 'sciences' of the Christian pre-Cartesian period concerned the nature of this object. Briefly, on the Aristotelian view (embedded in the medieval Thomistic tradition), the object of scientific knowledge was identified with the created realm of sensible objects. And since it was held that sensation provides our only means of access to such objects, sensation constitutes the fundamental canon of scientific measurement. By contradistinction, the object of the neo-Platonistist tradition in science was the 'really real', or the Forms or Ideas, the existence of which was construed as necessary, eternal and immutable. And because sensation is either not our only means of access to such objects or,
alternatively, cannot provide us with any such access at all, sensation cannot be held as a basic canon of measurement of Platonist or neo-Platonist science. Instead, reason (or, more accurately) perceptions of the intellect) provide the basic canon of measurement for Platonist 'science'. The crucial importance of the view that the method or basic canon of scientific measurement is secondary to, and determined by, the nature of the intentional object of scientific knowledge is thus clear.

Furthermore, we can now see why philosophy should be considered a 'science' par excellence. For the distinction between the two major traditions in medieval science is clearly a distinction between different schools of philosophical thought. However, although philosophy thus opened up the way for the development of conflicting 'scientific' cosmologies or world views, trapped within the framework of classical Greek thought, it could not itself resolve such conflicts. Thus, for want of anything better, it is easy to see why the Church might take on an arbitral role. For faith could provide what, in the last analysis, pre-Cartesian philosophy could not; viz, some criteria by which to determine the relative merits of competing cosmologies arising out of the different traditions in 'science' and philosophy.

The Cartesian Revolution
This 'broad brush' sketch of pre-Cartesian science and philosophy serves not only to highlight something of the nature of the radical transformation in our concepts of science and philosophy but, more importantly, to set the scene for Descartes' *Meditations* and the revolution it brought about. For it is in Cartesian philosophy that we see precisely how the destruction of pre-Cartesian science and philosophy was brought about and a new conceptual model was introduced.

In making this claim I do not discount the importance of the great 'scientific' discoveries of the sixteenth and seventeenth centuries. However, no matter how closely we examine them, such an examination can never of itself yield an understanding of the philosophical revolution which accomplished the destruction of the medieval Christian concepts of science and which gave rise to our characteristically modern concept of science. For an understanding of this -- the revolutionary infrastructure -- we must look, not to the work of such figures as Newton, Galileo, Copernicus, etc, but to the work of Descartes.
Chapter One: Footnotes

1 For a discussion of this point see Ree J, Descartes, p152-153

2 For a discussion of approaches to the history of philosophy, see Ree J. et al, Philosophy and its Past, Cchpt 1

3 Williams B, Descartes, p9

4 ibid

5 Grene M, Descartes, p3

6 See for example, Doney W (ed), Descartes (1967), or Hooker M (ed), Descartes (1978)

7 Rorty A O, 'The Structure of Descartes' Meditations', in Rorty A O (ed), Essays On Descartes' Meditations, p19

8 ibid

9 Rorty A O (ed), op cit, see for example, Kosman L A, 'The Naive Narrator: Meditation in Descartes' Meditations', Cchpt 2, Williams M, 'Descartes and the Metaphysics of Doubt', p18, Curley E M, 'Analysis in the Meditations: The Quest For Clear and Distinct Ideas', Cchpt 7

10 Copleston F, A History of Philosophy, Vol 3, Pt 2, p345

11 Barth K, Church Dogmatics, 11,7

12 ibid, 11,8
Chapter Two

CARTESIAN SKEPTICISM

The Strategic Objective

In the preceding chapter, I have argued that there is at least a prima facie case to be made for the view that Cartesian philosophy is properly interpreted and assessed as marking a revolutionary change in science and philosophy. And central to this revolutionary change is a radical transformation and restructuring of our concepts of 'science' and 'philosophy'. Furthermore, it is my contention that by thus interpreting Cartesian philosophy, significant philosophical problems which have come commonly to be associated with the exegesis of the Meditations can be readily resolved. Accordingly, I will turn now to an examination of some of the more important of these problems.

In the Meditations, a mature but relatively short work, Descartes employs an autobiographical style. He begins:

Some years ago I was struck by the large number of falsehoods that I had accepted as true in my childhood, and by the highly doubtful nature of the whole edifice that I had subsequently based on them. I realized that it was necessary, once in the course of my life, to demolish everything completely and start once again from the foundations if I wanted to establish anything at all in the sciences that was stable and likely to last. (CSM, 2, 12)
Here, Descartes seems clearly to be announcing that he will give free rein to skeptical doubt and, by this means, proceed to establish a firm and certain foundation for the entire body of science. On the face of it, such a strategy seems quite extraordinary - indeed, not to put too fine a point on it, it seems quite absurd. Thus, with this beginning we are immediately presented with substantial problems in interpretation and philosophy. What, precisely, is the nature of Descartes' project?

The 'Personal' Interpretation

In an attempt to make sense of this, many contemporary Cartesian commentators have taken the view that Descartes' autobiographical style is indicative of the essentially personal nature of the so-called Cartesian revolution. This view is expressed by Michael Williams who insists that "Descartes' Meditations recounts a journey from a prephilosophical commonsense to metaphysical enlightenment, each step of which is taken in response to an encounter with skepticism". On this model, the Cartesian revolution is essentially ahistorical. That is, it is seen as put forward by Descartes as some sort of paradigm for any beginning philosopher and enunciates a personal shift from what we might term a pre-philosophic to a philosophic attitude or approach to the search for truth. Consequently, this interpretation would have it that the revolutionary element in Descartes' thought can be adequately grasped without reference to the major
intellectual traditions of medieval Christian Europe. For Descartes' project is supposed to be, on this model, essentially a personal reflection leading to the development of a recognizably philosophical approach to the search for truth.

However, problems quickly emerge with this 'personal' interpretation when we consider the general strategy Descartes uses to achieve his stated objective: namely, that of establishing a firm and permanent foundation (and/or structure) for science. For, *prima facie* at least, it appears that Descartes is seeking to establish such a foundation for the sciences by means of a general overthrow and destruction of all his previous opinions and beliefs. To accomplish this destruction, Descartes says:

> it will not be necessary for me to show that all my opinions are false, which is something I could perhaps never manage. Reason now leads me to think that I should hold back my assent from opinions which are not completely certain and indubitable just as carefully as I do from those which are patently false. So, for the purpose of rejecting all my opinions, it will be enough if I find in each of them at least some reason for doubt. And to do this I will not need to run through them all individually, which would be an endless task. Once the foundations of a building are undermined, anything built on them collapses of its own accord; so I will go straight for the basic principles on which all my former beliefs rested. (CSM,2,12)

From this, it seems clear enough that Descartes considers his opinions to be systematically related to some sort of foundational position in much the same way that the bricks of a wall are related to the foundations of the wall. And, just as the wall can be demolished either by knocking out
the bricks one by one or, alternatively, by destroying its foundations, so similarly there are two approaches to the task of demolition Descartes has in mind. However, Descartes indicates that for his purpose, the most effective and economical approach is that directed against the foundations upon which the edifice of his opinions are built. What is not so clear is just what Descartes could have in mind when he adverts to the foundations of his opinions. Yet although the question of what stands to Descartes' opinions as the foundations of a wall stand to the bricks comprising it, is clearly of crucial importance, within the framework of the 'personal' interpretation (put forward by, for example, Anthony Kenny, Bernard Williams or Margaret Wilson) it is unanswerable. For each treats Cartesian philosophy as if it emerged from some sort of theoretical or philosophical vacuum.

a) Kenny

Ignoring the question of what stands to his opinions as the foundations stand to an edifice built upon it, Kenny condemns Descartes' method of proceeding as simply absurd. Matching metaphor for metaphor, Kenny suggests that Descartes' position is "like that of a man on the high seas trying to repair a leaky boat". And, he argues, "It is not possible to take the boat altogether to pieces and rebuild it afresh; the rotting timbers have to be replaced one by one."
The critical thought here at work is surely that in order to establish a firm and stable foundation for science, it may be both rational and appropriate to rid oneself of false beliefs or opinions, but it is foolish to imagine that the desired foundation for science can be established by means of the wholesale overthrow and destruction of all one's beliefs and opinions. For this would involve Descartes in an attempt to saw off the branch upon which he sits.

Further, as Kenny points out, Descartes does not doubt literally 'everything'. He does not, for example, doubt the meanings of the words he uses, nor does he cast into doubt the so-called principles of our natural light (i.e. principles of reason). This Kenny sees as evidence that Descartes has failed to execute his own program of doubting whatever can be doubted. However, he claims, this failure was inevitable just because "it is impossible to criticize and correct a belief except in the light of other beliefs, [and therefore] it is impossible to criticize the totality of one's beliefs at a single time". Thus Kenny concludes that "A universal doubt is neither necessary nor rational; and Descartes' own program falls far short of 'doubting whatever can be doubted'".

On this account, which particular beliefs are rejected by Descartes as doubtful and which are retained emerges as a matter of somewhat arbitrary judgement, and Descartes' own judgement, Kenny suggests, can be accepted only if we
are prepared to accept from the outset the Cartesian system with its doctrine of innate ideas, indubitable simple natures, theory of the natural light of the intellect, etc. Since on Kenny's view these doctrines are highly suspect, it is easy to conclude that Descartes' project is fundamentally flawed and easily dismissed as a somewhat naive exercise of a beginning philosopher. Thus we are in effect led to suppose that, although of undoubted historical interest, Cartesian philosophy cannot be regarded as meriting perennial philosophical interest, nor as constituting a work of foundational stature.

b) Williams

Bernard Williams, rather more charitably, devotes considerable scholarly energy and ingenuity to an attempt to discover what reason Descartes could have had for "regarding this unobvious strategy as straightforwardly the rational course". Although he at no stage attempts to argue that Descartes' use of systematic doubt is philosophically sound, in his view it is at least understandable. He maintains that Descartes' strategy is "to aim for certainty by rejecting the doubtful", and he points out that to "reject the doubtful here means, of course, to suspend judgement about it, or at most to treat it as false for the purposes of the argument, not to assert that it is false".

Thus, against Kenny, Williams claims that the strategy
of doubt:

is not merely arbitrary, relative to the way Descartes construes his task - to get away from it, one has to reject very basically Descartes' interpretation of the search for truth. While it may be ultimately misguided to set such a high standard, taking the search for truth as (at least in the first place) the search for certainty, it is not a merely gratuitous distortion, as is often suggested; its motivation lies deep in a quite natural conception of enquiry.9

In other words, Descartes is, on Williams' view, equating the search for truth with the search for certainty. This point Williams makes clear by claiming that Descartes' method of doubt represents a way of:

overcoming any systematic bias or distortion or partiality in our outlook as a whole, in our representation of the world: overcoming it, that is to say, in the sense of gaining a standpoint (the absolute standpoint) from which it can be understood in relation to reality, and comprehensively related to other conceivable representations.10

This attempt to gain 'the absolute standpoint' and hence to discover an 'absolute conception of reality' is, on Williams' view, understandable enough. But, he argues, it is highly questionable that the search for certainty is either an appropriate way or the only way of achieving the 'absolute standpoint' or 'absolute conception' of reality that Descartes seeks. For in the first place, Williams claims, it sets an unduly high standard for truth and, in the second place, it may be that no such 'absolute conception' is possible. Thus, Williams suggests that Descartes' entire project, with its "search for the Archimedean point is based on an illusion."11.
Indeed, Williams further argues, even if it were granted that an 'absolute conception' is possible, or that it is at least worth searching for, there remains the important question of whether such a conception must be grounded in certainty. For, as he points out, "it may be that the search for certainty is only one approach to acquiring such a conception. There may be other approaches."12

These 'other approaches' Descartes manifestly failed to consider, and in so doing he failed, on Williams' view, to take into account the collective nature of the enterprise of Pure Enquiry. Williams explains:

- it is entirely natural to take 'our' representations to be collective representations, social products shared by individuals in a society or cultural group....[But it] is not hard to think of ways in which what we know may be more than a simple sum of what each of us knows. When we turn from knowledge of the activity, central to Pure Enquiry, of self-criticism, it is very obvious that our self-criticism may essentially involve many selves.13

To this point Descartes seems to have been quite blind. His enquiry is conducted in the first person singular and "even if he conducts enquiry as our representative, he does it by himself"14. Thus Williams concludes:

- That fact in itself is enough to cast some doubt on the programme for the theory of knowledge which ties it to the first person singular.15

Although these criticisms are couched in relatively moderate terms, it is clear that Williams views the Cartesian project as highly problematic. Descartes'
strategic objective - namely, an 'absolute conception' of reality - may well be nothing but an illusion and, in any case, his general approach or methodology is highly questionable.

c) Wilson

In an attempt to defend Descartes and to reveal his philosophy in a somewhat more favourable light, Margaret Wilson argues that Cartesian doubt must be understood, not in constructive, but in destructive terms. For Descartes' objective, as Wilson sees it, is not the constructive one of acquiring an absolute conception of reality, or something of that sort, but the destructive one of accomplishing the overthrow of the hitherto prevailing world view or cosmology. Accordingly, Descartes' problem is not that of how to bring his beliefs into accord with reality or something of that sort for he is, Wilson claims: "playing a deeper game -... in effect trying to overthrow prevailing opinions and beliefs".16

And this is a thoroughly correct view, flawed, however by the fact that Wilson fails to adequately identify the precise and fundamental nature of the target for destruction. For Wilson does not go far enough; she does not question the assumption that Cartesian philosophy emerged from an effective philosophical/scientific vacuum. This, in its turn leads to the difficulties she experiences in reconciling Descartes' destructive objective with his
destructive methodology.

Wilson notes that, although Descartes indicates very casually that he will attack his opinions by attacking the principles upon which they are based, "he gives no justification of the notion that his beliefs are 'based on principles', and no clarification of what he means by 'principle'". In an attempt to remedy this deficiency, she suggests that the then prevailing world view was based on, or derived from, what she terms the 'commonsense prejudices of our youth'. These prejudices, she claims, "have a strong hold, both psychologically and epistemically. A concerted onslaught is the only justifiable approach for the sort of intellectual revolution Descartes intends to bring about.'

With this move Wilson seeks to defend Descartes from the sort of criticism launched by Kenny which, as we have seen, focuses on the irrational nature of any attempt to accomplish the wholesale overthrow and destruction of all one's beliefs and opinions in order to establish a firm and permanent structure for science. However, on this construction, it is not at all clear why Descartes should choose to employ the arguments of the skeptics as the means by which to accomplish the requisite demolition. For it is, as we shall see, highly doubtful that skeptical argument is an effective, or even appropriate, means by which to overthrow and destroy prejudice.
Although Wilson does not provide us with an explanation of what she means by 'prejudice', when we think of people under the sway of prejudice we generally think of people who are not able or prepared to enter into rational debate concerning their opinions or, alternatively, who refuse to alter their opinions even when confronted with overwhelming evidence that they are mistaken. These are the sorts of factors which lead us to classify an opinion or belief as a prejudice. Thus, to say that we are prejudiced in favour of 'p' is generally taken as meaning that we favour 'p' regardless of the evidence, theoretical or rational justification (or lack thereof) for so doing. If this analysis is broadly correct, it is apparent that prejudice is just not the sort of thing which can be destroyed by skeptical argument. For skeptical argument can at best succeed in demonstrating that we have insufficient evidence, theoretical or rational ground for holding to a belief or opinion. And since prejudices are those beliefs or opinions which, ex hypothesi, are held regardless of supporting evidence or of rational or theoretical justification, clearly skeptical argument cannot be capable of accomplishing the destruction and overthrow of prejudice. Thus, Wilson's attempt to defend Descartes and render coherent his general strategy of doubt must fail.

However, by distinguishing between prejudice and philosophical dogma, something of Wilson's argument can be salvaged, and Descartes' employment of skeptical argument can be understood as both coherent and appropriate. For
although opinions or beliefs held by a philosophical
dogmatist can be identical in content with those held by
one under the sway of prejudice, the former are at least
purportedly self-consistent and justifiable in the light of
evidence, rational or theoretical argument. And for
precisely this reason, skeptical argument can pose problems
for the philosophical dogmatist yet be quite ineffective
against prejudice. In short then, unlike philosophical
dogmatists, the door of those under the sway of prejudice
is shut tight against the purveyors of rational inquiry,
argument and doubt, and thus there is no way in which
skeptical argument can destroy prejudice.

This latter point Wilson appears to recognize, albeit
somewhat obliquely, when she raises (and acknowledges
herself utterly stumped by) what she describes as the:

peculiar and perplexing question of how Cartesian
skepticism relates to real doubt - or whether, in
Kenny's terminology, 'Descartes ever really doubts'
his most basic philosophical and commonsense
opinions.19

The point to be gleaned from Wilson's puzzlement is surely
that if Descartes' skeptical arguments are supposed to
destroy the prejudices upon which the medieval Christian
world view was based, then they must engender real or
practical doubt. However, not only does Descartes make no
such claim, but he appears repeatedly and emphatically to
assert quite the opposite. In his Comments on a Certain
Broadsheet, he says:
I have never taught that 'God is to be denied, or that he can deceive us, or that everything should be doubted, or that we should entirely withdraw our confidence in the senses, or that we should not distinguish between being asleep and being awake', and other things of that sort - doctrines of which I am sometimes accused by ignorant detractors. I have explicitly disavowed all such views, and refuted them with very strong arguments - stronger, I venture to add, than any that anyone before me has employed in refuting them. What could be more perverse than to ascribe to a writer views which he reports simply in order to refute? What could be more foolish than to pretend that during the interval in which such views are being stated, pending their refutation, they are the doctrines of the writer, and hence that someone who mentions the arguments of the atheists is temporarily an atheist? (CSM, 1, 309)

Here Descartes is firmly denying that his skeptical arguments are expressions of any real doubt relating to the existence of God or the reliability of the senses and thus, on Wilson's model, it is very difficult to grasp Descartes' strategy as philosophically coherent. However, while Wilson concedes that there are indeed real difficulties associated with her interpretation of Descartes' project, she rightly insists that:

these concessions must not obscure the primary point: that through methodic doubt Descartes is attempting to bring about a radical and systematic revision in the contemporary world view. His procedure cannot be comprehended or criticized in abstraction from this goal.20

In the light of this brief survey of some of the more influential and mainstream contributions to Cartesian scholarship, Ed Curley's casual comment to the general effect that the whole Cartesian project "is of course highly problematic"21 seems unexceptionable. For it seems that whatever construction is put on the project,
substantial difficulties and problems inevitably emerge.

Towards a New Perspective

Underlying every one of these not unrepresentative interpretations of Descartes' project, is the assumption that Cartesian philosophy emerged from some sort of theoretical and philosophical vacuum. Given this assumption, Cartesian philosophy cannot but be interpreted and assessed without reference to preceding traditions in science and philosophy. However, not only is this assumption wrong but, worse, it leads us to mistakenly attribute to Descartes errors and philosophic naivety of gross proportion. Indeed, so gross and various are the errors ascribed to Descartes that it has become very difficult for any beginning student of philosophy to understand why Descartes should be listed among the great philosophers. For, abstracted from its historical context, the dialectic of his argument is lost; its revolutionary impact becomes so perverted that the problems associated with it appear hydra-headed. Thus it often seems that the best that can be done with Cartesian philosophy is to show why Descartes should have fallen into error - to understand and forgive him his mistakes!

Yet if we are to understand why Descartes is deservedly listed amongst the few great names in philosophy, we must do much better than this. And I will show that if, instead of dismissing pre-Cartesian Christian philosophy as somehow
naive and unsophisticated, we recover it, we can thereby similarly recover the dialectic and revolutionary impact of Cartesian thought. This, indeed, is the approach suggested by Descartes' use of skeptical argument. Descartes himself repeatedly points out that these arguments contain nothing new and this is, prima facie, a clear indication that his project cannot be understood in abstraction from the dominant philosophical doctrines of his day.

For skeptical argument is a sophisticated form of philosophical argument. That is, in the same way that, in the political arena, institutionalised and systematic dissent presupposes a relatively high level of political sophistication and maturity, so also does philosophical skepticism presuppose a relatively high level of philosophical sophistication and maturity. Furthermore, just as our understanding of dissenting political positions involves some understanding of the political position(s) under attack, our understanding of any particular philosophical skeptical argument involves some understanding of the dominant philosophical position it opposes. This is the point made by Popkin when he explains that skeptical arguments are parasitic in the sense that: they assume the premises of the dogmatist and show problems that ensue, on the standards of reasoning of the dogmatist. For the dogmatist, the skeptical arguments, regardless of whose they are, pose basic difficulties; and if he sees their relevance to his own view, it is he who must deal with them if he wants to be satisfied that his position is tenable.22
Like skeptical arguments generally, the intelligibility and destructive efficacy of Cartesian skepticism is predicated on pre-existing systems and/or doctrines of philosophy and/or science. To treat skeptical argument in abstraction from such systems or doctrines is to treat what is parasitic as if it were not. Inevitably, problems ensue. As Popkin says:

The skeptics from Empiricus to Montaigne, Bayle, Hume and Santanyi have pointed out ... the strength of skepticism lies not in whether it is tenable as a position but in the force of its arguments against the claims of dogmatic philosophers.23

This point is well emphasized by Popkin as he continues by characterising skeptical arguments as functioning, not as one among many philosophical positions, but:

like an anonymous letter received by a dogmatic philosopher who does hold a position. The letter raises fundamental problems for the recipient by questioning whether he had adequate grounds for his assertions and assumptions or whether his system is free from contradictions or absurdities.24

Such 'letters' may well be ignored by those under the sway of prejudice, but for the philosophical dogmatist they raise serious problems which must be dealt with if, that is, the dogmatist wants to be satisfied that his position is philosophically tenable; that is, one which cannot be dismissed as mere prejudice.

Prima facie there is thus strong reason to claim that Cartesian skepticism should be considered and assessed like other skeptical arguments: that is, not in terms of whether
it constitutes a philosophically tenable position, but in
terms of the problems it raised for the philosophical
dogmatists of the day. The assumption to the contrary —
that Descartes' skeptical arguments can be understood in
abstraction from established and pre-existing philosophical
or theoretical doctrines— is a significant one which
requires justification. Yet, short of asserting that
Cartesian philosophy emerged from a philosophic/theoretic
vacuum, such a justification is difficult to find.

Descartes himself gives no indication that there is
anything novel about his use of skeptical argument. Rather
to the contrary, he says:

Although I had seen many ancient writings by the
Academics and skeptics on this subject, and was
reluctant to reheat and serve this precooked material,
I could not avoid devoting one whole Meditation to
it.(CSM,2,94)

Much the same point is repeated when, in response to the
Third Set of Objections, Descartes says:

The arguments for doubting, which the philosopher here
accepts as valid, are ones that I was presenting as
merely plausible. I was not trying to sell them as
novelties ....(CSM,2,121)

These passages certainly do not suggest that the skeptical
arguments rehearsed in the First Meditation should be
treated as differing from other skeptical arguments. It is
therefore my contention that the skeptical arguments
rehearsed by Descartes in his First Meditation are
parasitic on, and designed to throw into question, the
theoretical foundations of the major philosophic and scientific traditions of medieval Christian Europe.

Although I shall later move to a more detailed exposition of the particular skeptical arguments employed by Descartes and the nature of the positions under attack, my concern at this point is with the more general questions concerning the nature of Descartes' project and the logic or coherence of his strategy. For before we can be in any position to either comprehend or assess the philosophical merit of Descartes' arguments we must develop some understanding of the strategical objective they are designed to serve. To this end it is crucial not only that we recognize the existence of the major philosophic and scientific traditions of medieval Christian Europe, but further, that we are able to identify their major distinguishing features.

The Destructive Objective

We have already seen that, for the Aristotelian/Thomist tradition, the existence of finite created physical objects and the reliability of sense perception as a means of access to such objects is foundational to the whole structure of science. In as much as doubt can be cast on either of these foundational assumptions, the whole structure of Aristotelian/Thomistic science must also be considered as dubitable. For the neo-Platonic/Augustinian tradition, on the other hand, the eternal and immutable
existence of God and the reliability of reason/divine illumination as a means of access to Ideas of the Divine Intellect is foundational to the whole structure of science. And in as much as doubt can be cast on either of these foundational assumptions, the whole structure of neo-Platonic/Augustinian science is thrown into question. Now it is precisely these foundational assumptions of the pre-Cartesian 'science' that are thrown into doubt by the skeptical arguments rehearsed by Descartes in his First Meditation. Thus, although it is not altogether unreasonable to claim that by means of skeptical argument Descartes throws into question all that had been generally accepted as true within the community of his childhood, this is so only in so far as the community of his childhood was informed by the dominant sciences of the time.

At this point it is worth remarking that, by attacking the foundations of scientific knowledge, Descartes cannot be taken as attacking the truth or reliability of any particular scientific knowledge claim. Rather, he would have to be read as he is attacking the truth or reliability of all that was counted as 'scientific knowledge', or all that could have been said to have been 'scientifically' established. Thus Descartes is bringing into focus the nature of 'science' itself, rather than the truth or reliability of any particular 'scientific' knowledge claim. This being so, we are now in a position to understand and resolve the problem of how Cartesian doubt relates to 'real' doubt and why, on the one hand, Descartes should say
that:

the sceptics who neglected human affairs to the point
where friends had to stop them falling off precipices
deserved to be laughed at. (CSM,2,243)

but on the other hand, insist that:

When I said that the whole testimony of the senses
should be regarded as uncertain and even as false, I
was quite serious; indeed this point is so necessary
for an understanding of my Meditations that if anyone
is unwilling or unable to accept it, he will be
incapable of producing any objection that deserves
reply. (CSM,2,243)

Cartesian doubt is certainly real and serious but it
relates, not to the practical activities of life, but to
the theoretical foundation of the sciences of the day and
thus the reliability of that body of knowledge counted as
'scientific'. Thus, while Cartesian skepticism and the
resultant doubts are real and to be taken very seriously
indeed, they do not concern the practical conduct of life.
Furthermore, for philosophers or scientists of the post-
Cartesian period, Cartesian skepticism poses no problem.
For generally speaking, modern philosophers and scientists
are not working within the sort of theoretical framework
rendered dubitable by Cartesian skepticism. And for this
reason alone, it is misleading to consider the Cartesian
Meditations as somehow providing a paradigm to be followed
by any beginning philosopher. For what is at issue here is
neither youthful prejudice nor the practical conduct of
life. Rather, what is at issue is the philosophical
foundations of the 'sciences' and, concomitantly, the
reliability of that general edifice of knowledge which was
counted as 'scientific'.
As one raised in the skeptical atmosphere of early seventeenth-century France, it is not at all surprising that Descartes should have sought to meet the challenge to science posed by the arguments of the skeptics. And given that these arguments had already thrown into question the reliability of scientific knowledge generally, the charge that Descartes' pursuit of certainty, in the form of indubitability, is a prejudice on his part, a gratuitous philosophical ambition, conditioned perhaps by his being over impressed by mathematics 25 is plainly ill-founded.

There is nothing gratuitous in the attempt to establish the reliability of science against the theoretical doubts raised by skeptical argument. Nor is there anything ill-conceived in the attempt to meet the skeptical challenge to science by establishing absolutely certain theoretic foundations for science. For this is the minimal requirement which must be met by any who, in opposition to the skeptics, would seek to establish the reliability or the bona fides of what, in general, counts as 'scientific' knowledge. Thus, speaking of the arguments of the skeptics, Descartes says:

I was not looking for praise when I set out these arguments; but I think I could not have left them out, any more than a medical writer can leave out the description of a disease when he wants to explain how it can be cured. (CSM, 2, 121)

The 'disease' which Descartes is concerned to 'cure' is, for want of a better term, the dubitability or
unreliability of that general body of knowledge which counted as 'science'. To 'effect a cure' and to establish science as a reliable body of knowledge Descartes goes not only to the heart of the problem but, moreover, he does so in a radical way. For such is the problem that its resolution demands a redefinition of 'science'. Thus, his strategy is not to enumerate and winnow out true from false scientific knowledge claims; rather, it is, far more radically, to transform (and in a crucial sense, reform) the notion of 'science' and thereby to redefine what counts as 'scientific' knowledge. Thus, rather than treating its symptoms, Descartes is, as it were, attacking the cause of the disease.

Here we should note that the form the Cartesian redefinition of 'science' must take must be, to a significant extent, determined by the diagnoses of the 'disease' from which science was suffering. And to ensure that its nature is fully understood, Descartes insists that, although stale and anonymous, the arguments of the skeptics rehearsed in his First Meditation are of sufficient importance to warrant the recommendation that the reader:

not just to take the short time needed to go through it, but ... devote several months, or at least weeks, to considering the topics dealt with, before going on to the rest of the book. If they do this they will undoubtedly be able to derive much greater benefit from what follows. (CSM, 2, 94)

Putting aside medical metaphor, the critical analysis
developed by the argument so far allows us to see clearly the revolutionary nature of Descartes' project and thus to understand the general nature of his strategy. His first strategic objective is to bring into clear focus the foundational nature of the flaws in medieval Christian traditions in science. His second, is to show that this, far from leading us to a wholesale rejection of science and thus to a point where we can choose only between skepticism or faith, points the way to a third alternative; namely, one involving a radical reconstruction of science. Clearly, this reconstruction must involve a rejection of the flawed foundations upon which the edifice of the 'sciences' had been built. The problem, however, is to show that the rejection of such foundations does not necessarily involve a rejection of science. And, as we shall see, Descartes' solution to this problem is to show that an edifice of science can be built on foundations which differ from the old in the requisite sense; namely that they cannot be rendered dubitable by skeptical argument.

For since the sciences of pre-Cartesian Christian Europe are rejected on the ground that they are flawed by virtue of the dubitability of their foundations, the development of indubitable theoretic foundations for science is no merely gratuitous ambition, but a minimal essential requirement for any resolution of the problem here at issue. Thus, Descartes' use of skeptical argument serves both to bring into focus the weakness in the very
foundations of the medieval Christian sciences and, at the same time, to prepare the ground for the development of a new foundation for science and thereby the development of a new concept of 'science'. And, of course, this new concept of science must differ from the old in that it must be capable of withstanding the same sort of skeptical attack which resulted in the overthrow of the old. In this revolutionary strategy, elegant in its simplicity, what is at issue is not the truth or falsity of the foundational assumptions or principles of science; rather it is their vulnerability to being rendered dubitable by skeptical argument. This then is the modus operandi of the exploitation of skepticism in Descartes' Meditations.

**Cartesian Skepticism and its Cure**

It remains now to show that the argument thus far enables us not only to understand the point of Cartesian doubt but also to predict, without further reference to Descartes' text, the content of the principles upon which Cartesian science will be grounded. For this purpose, we must turn once again to a consideration of the nature of skeptical argument. For it is apparent that Descartes can succeed in establishing a firm and certain foundation for science, if he can show that a systematic structure of science can be derived from that upon which the destructive power of skepticism is itself derived. Clearly, in as much as science can be thus derived, it will be grounded in principles which are, in principle, immune to destruction.
by skeptical argument. In short then, in so far as Cartesian science is grounded upon the same principles as those upon which the destructive power of skeptical argument is predicated, Descartes can claim to have met and overcome the challenge skepticism posed for science and thus to have established a firm and permanent foundation for science.

By way of exploring this essentially positive and constructive aspect of Descartes' strategy, I want to turn now to specifically examine what sorts of things can and, more particularly, cannot be rendered dubitable and destroyed by skeptical arguments of the sort rehearsed in Descartes' First Meditation. These arguments render dubitable foundational principles of medieval Christian science relating to the nature and existence of the purported object of science and the reliability of our means of access to such objects. However, the fact remains that they do not render literally everything dubitable. This, contrary to Kenny's claim, is no merely arbitrary or contingent fact.

As we have seen, Kenny has pointed out that Descartes does not doubt literally everything. The meanings of words and the so-called common notions or principles of our natural light (i.e. of reason) escape Cartesian doubt altogether. But since, on Kenny's own account, a universal doubt is neither necessary nor rational, the fact that Cartesian skepticism does not render literally everything
dubitable does not seem to constitute ground for complaint. Rather the contrary. For Cartesian doubt is skeptical doubt, and skeptical doubt is a form of doubt produced not by forgetfulness or mental confusion, but by rational argument. And it is a question whether, by means of such argument, it is possible for the skeptic to persuade the dogmatic philosopher that the meanings of the words, or the principles of reason he uses are dubitable.

As regards the dubitability of the meanings of words, the question is easily enough answered. For even assuming that some sort of doubt can be generated on this matter, it is difficult to see why any such doubt should be of concern to the philosophical dogmatist. For it must always be open to the dogmatist to resolve such doubts arbitrarily; by providing a definition of the meanings of the words used.

However, as regards the principles of our natural light, of reason or of logic, the situation is rather more complex. And because these principles lie at the foundation of Cartesian science, it is worth closely considering what reason Descartes may have had for regarding them as immune from skeptical doubt.

Remembering that the power of skepticism consists not in whether it is tenable as a position but in its ability to bring into focus and to raise problems for the philosophical dogmatist, it is at least arguable that the skeptic must assume the same standards of reasoning as
those employed by the dogmatist just in order to persuade the dogmatist that there are problems to be confronted. For unless the skeptic employs the same standards of reasoning as those employed and accepted by the dogmatist under attack, it is open to the dogmatist to deny that the arguments of the skeptics are relevant to, or pose basic problems for his position. Thus the skeptical arguments rehearsed in Descartes' First Meditation must use the same standards of reasoning as the philosophical dogmatists just in order to show that the premises on which the dogmatists rely are, on the standards of the dogmatists, theoretically dubitable. Only thus is the dogmatist obliged to admit the relevance of the problems brought into focus by the arguments of the skeptics. And because the skeptic cannot attack these principles without at the same time sawing off the branch upon which s/he sits, these principles may not unreasonably be considered as immune from skeptical attack.

Of course, following the Cartesian intervention in philosophy, skeptical argument has been refashioned and redirected and, it is argued by some, that skeptical doubt can be cast on principles of reason. However, this must not be allowed to obscure the primary point; namely, that by deriving science from the same principles from which the skeptical arguments rehearsed in Meditation One derive their destructive force, Descartes can reasonably claim to have established a firm and certain foundation for science.

This claim is, however, to be distinguished from the
claim that science is reliable in the sense that it provides us with some sort of 'absolute conception' of reality - a God's eye viewpoint. It may be that it does not. For although the principles upon which Cartesian science is based are what we might term strictly epistemic principles - that is, principles which govern and constrain what we count as reasoning or as rational - it is possible that these principles do not similarly govern or constrain things outside the mind or which exist independent of any knowledge we may happen to have of them. Thus it is possible that there is a mismatch between principles of epistemology and principles of ontology. It is one thing to claim, for example, that the principle of non-contradiction governs or constrains what we count as reasoning or as rational, but another thing altogether to claim that mind-independent things are similarly so governed and constrained. And if what exists outside the mind is not governed, regulated or constrained by the same principles as those which govern, regulate or constrain what we count as reasoning, then what is real - what exists - would be unintelligible for us. To accept this point is to accept that it may be, in the terminology employed by Williams, that no 'absolute conception' of reality is possible or, at least, intelligible for us. This point is clearly accepted and acknowledged by Descartes when he says:

What is it to us that someone may make out that the perception whose truth we are so firmly convinced of may appear false to God or an angel, so that it is, absolutely speaking, false? Why should this alleged 'absolute falsity' bother us, since we neither believe
in it nor have even the smallest suspicion of it? For
the supposition we are making here is of a conviction
so firm that it is quite incapable of being destroyed;
and such a conviction is clearly the same as the most
perfect certainty. (CSM, 2, 103)

Thus, although for all we can ever know, there may be a
mis-match between the principles which govern what we count
as reasoning and the way the universe actually is, since it
is only by virtue of our principles of reason that the
universe is intelligible for us, we must content ourselves
with the level of certainty of which we are capable. To
reject this on the ground that it does not deliver an
'absolute' conception of reality, would be to saw off the
branch upon which we sit and to reduce ourselves to the
level of brutes.
Chapter Two: Footnotes

1 Like most contemporary English-speaking students of Descartes, I have generally relied on the convenient two-volume edition of his works, The Philosophical Writings of Descartes, translated by John Cottingham, Robert Stoothoff and Dugald Murdoch. For ease of reference, I have generally followed the convention of including all citations of this work in the body of the text under the abbreviation CSM, followed by volume and page number.

2 Williams M, 'Descartes and the Metaphysics of Doubt', in Rorty A (ed), Essays On Descartes' Meditations, p117

3 Kenny A, Descartes: A Study of His philosophy, p20

4 ibid

5 ibid

6 ibid, p38-39

7 Williams R, Descartes, p36

8 ibid

9 ibid

10 ibid, p66

11 ibid, p67

12 ibid, p67

13 ibid, p70-71

14 ibid, p70

15 ibid, p71

16 Wilson M D, Descartes, p8
17 ibid, p5
18 ibid, p9
19 ibid, p42
20 ibid, p9
21 Curley E, Descartes Against The Skeptics, p46

22 Popkin, 'Skepticism', Encyclopedia of Philosophy,
23 ibid
24 ibid
25 Williams, op cit, p36
In her book *Descartes*, Marjorie Grene points out that although much has been written on Descartes, within the English speaking tradition his work is almost invariably discussed and assessed in terms of its contribution to questions of interest in twentieth-century philosophical debate. As a result, says, Grene, "the real Descartes is simply left aside altogether". Furthermore, she claims: since we are products of our own past, this means that we miss not only Descartes on his own terms, but ourselves too. In the narrowness of our own perspectives we miss not only our historical target but the reflective awareness of our own beliefs that should be the aim of philosophy.

Consistent with this view, I have argued that in order to recover what Grene terms the 'real' Descartes, we must also recover something of the seventeenth-century problematic he addresses. For without this, we can neither grasp Descartes' philosophical genius nor recognize the degree to which we ourselves remain trapped within the Cartesian framework.

In pre-Cartesian medieval Christian Europe a fundamental concern of philosophy centered on questions relating to the source of all ordinary human knowledge. It was generally accepted that the fundamental problem for this debate
involved taking into account two commonly recognized extremes. On the one hand, there was the neo-Platonist view which held that the source and foundation of knowledge is that which is necessary, eternal and immutable. Aristotelian/Thomistic philosophy and science, on the other hand, nailed its colours to the mast of the created order of sensible objects and held these as the starting point of knowledge.

Descartes' contribution to this debate was radical in its nature. For far from attempting to map out a middle way between these polar extremes, he employed the arguments of the skeptics to attack and destroy each polar extremity on its own ground. As a result, Descartes can rightly claim to have shown that the entire edifice of pre-Cartesian science is grounded on foundations which are dubitable. However, unlike his skeptical predecessors (who arguably showed the same thing), Descartes does not rest content with this. He does not, for example, seek a remedy for skeptical doubt in the suspension of judgement (epoche), or in faith, custom, habit or tradition. Thus, he never follows the path of the so called 'classical' skeptic who:

having got beyond the need to justify and explain, ... lives by his spontaneous observations and impulses, the customs he has grown up with or come to feel comfortable with, and the practices of his trade or profession. 4

Far from thus forsaking the path of reason in favour of
the lessons of nature or of faith, Descartes embarks on a project of reconstruction. He considers the dubitability of the foundations of science as ground for their rejection; for building an altogether new foundation upon which the edifice of science can be reconstructed. And with the construction of this new foundation for science, we see a shift in (or relocation of) the purported source of all ordinary human knowledge and thus, the birth of the post-Cartesian tradition in philosophy and science.

**The Target**

Descartes' destructive strategy begins with a skeptical argument which is both parasitic on, and designed to destroy the Aristotelian/Thomistic view regarding the source and foundation of all ordinary human knowledge. Briefly, his argument is one which throws into doubt the reliability of the senses and thus the existence of the created order of sensible objects. It begins:

> Whatever I have up till now accepted as most true I have acquired either from the senses or through the senses. But from time to time I have found that the senses deceive, and it is prudent never to trust completely those who have deceived us even once. (CSM, Vol 2, p12)

From this, it is clear that the target of first skeptical argument employed by Descartes is the reliability of the senses. What is not so clear is the particular concept of sensation here under attack. However, if only to preserve historical integrity, it is appropriate to look, not to the
concept of sensation embedded in post Cartesian philosophy, but to that embedded in pre-Cartesian philosophy. Thus, far from unreflectively ascribing to Descartes some sort of naive notion of sensation, we must look toward the concept of sensation which underpins the Aristotelian/Thomistic tradition in philosophy and science. This concept is, as we will see, quite unlike that characteristic of post-Cartesian philosophy. And, although it may be somewhat obscure and difficult for the post-Cartesian reader to comprehend, it is by no means theoretically naive. For we will see, to the contrary, that it is more theory-laden than the concept of sensation familiar to post-Cartesian philosophy. Indeed, I will argue, the emergence of the distinctively post-Cartesian concept of sensation involved a divestment of sensation from the theoretical claims of Thomistic philosophy. And the process by which this divestment was accomplished and which, concomitantly, gave birth to the characteristically post-Cartesian concept of sensation, is made explicit in Descartes' so-called Dreaming Argument.

Sensation: A Thomistic View

However, to establish this claim it is necessary first to establish the major relevant features of the Thomistic concept of sensation. For the Thomist, sensation plays a crucial role in science (and the acquisition of knowledge generally) only because it provides naturally veridical access to the created order of mind-independent sensible
objects. Thus, unlike the concept of sensation characteristic of post-Cartesian philosophy, for the Thomist, sensation provides that by means of which the mind-independent existence of sensible objects is, as it were, immediately delivered to us. So far, this looks very like a naive notion of sensation. But this view is quite mistaken. For on the Thomist model, the concept of sensation involves an 'ontological accord' between sentient subject and objects existing in nature. And although this 'ontological accord' is not itself constitutive of scientific truth (sometimes termed the 'logical truth of judgement'), the truth of scientific knowledge results and literally flows from what Gilson describes as:

> an ontological accord between being and intellect, that is to say in a a conformity of fact between these two as it is set up between an eye and a colour perceived; and this is expressed in the classic definition of Isaac Israel: veritas est adequadio rei et intellectus, or again in that given by St Anselm and also adopted by St Thomas: veritas est rectitude sola mente perceptibilis...

Whatever the problems may be for us in understanding the thought here in play, it is at least clear that with sensation thus construed, the realist credentials of any empirical science are guaranteed. For the having of a sensation guarantees the existence of created mind-independent sensible objects. And for this reason alone, Thomistic empiricism must be sharply distinguished from post-Cartesian empiricism.

For on the post-Cartesian model, sensations are
construed simply as impressions in consciousness - as strictly mental phenomena. Thus construed, the relation between sense impressions and sensible object is not internal to the concept of sensation. Rather, the nature of this relationship is a highly problematic question for post-Cartesian empiricism. And although Locke, Berkeley and Hume each provide a different response to it, each is an empiricist in the post-Cartesian tradition because each takes impressions of sense as the source and foundation of knowledge. They are thus to be sharply distinguished from empiricists of the Aristotelian/Thomistic tradition. For this latter tradition takes the sensible object existing in nature as the source and foundation of all things epistemic. Conversely, on this line, the nature of sensation cannot be grasped in abstraction from sensible objects existing in nature. Indeed, such is this model and its radical measure of remove from that which we (post-Cartesians) employ, that there is quite literally no real distinction between sensation and sensible object. Concomitantly, it admits of no gap which would allow room for, say, Hume's skepticism regarding the existence of sensible objects or Berkeley's idealism.

Here, it should be remarked that Aquinas considered, and explicitly rejected, the concept of sensation characteristic of post-Cartesian empiricism. He says:

Some have held that our cognitive powers know only the impressions made on them, for instance, that sense knows only the alteration of its organ. According to this reading mental states are the objects of
Anticipating Hume, Aquinas recognized that if sensation is thus construed then it would follow that science does not deal with non-mental things but merely with impressions in consciousness. In other words, and as Hume was subsequently to recognize, a 'science' which abstracts sensation from the being of sensible objects and takes sense impressions as the source and foundation of knowledge, cannot yield knowledge of anything beyond the immediately obvious and demonstrable relation of ideas. Failure to recognize this, Aquinas pointed out, would revive the ancient error of maintaining that whatever seems so is truly so.

From this it is clear that Aquinas, no less than Hume, was aware of the difficulties involved in claiming that sensations, construed as impressions in consciousness, are copies or representations of things existing outside the mind. But where these difficulties led Hume into a skepticism regarding the possibility of knowledge of things existing outside the mind, Aquinas avoided these difficulties by insisting that sensation cannot be understood in abstraction from the being of sensible objects existing outside the mind.

Since this point is one of central importance it is worth stressing the warning given by Gilson when he says:

Undoubtedly, the unfortunate habit we have acquired
since Descartes of proceeding always from thought to things, leads us to interpret *adequatio rei et intellectus* as if it involved a comparison between the representation of a thing and this mere phantom, which is all the thing outside the representation can be for us. It is easy to amuse oneself by denouncing the innumerable contradictions in which epistemology involves itself when it enters on this path, but we should have the justice to add, since it is a fact, that the classical medieval philosophy never entered on it at all. When it speaks of the truth, it does indeed refer to the truth of judgement, but if the judgement is conformed to the thing it is only because the intellect putting forth the judgement has first itself become conformed to the being of the thing.

On the Thomist model then, the truth of scientific knowledge is consequential on a prior 'sense-mediated' ontological accord or identification of intellect with the being of things outside the mind. And just because this is so, Thomistic science necessarily relates to things existing in nature and, concomitantly, the concept of scientific truth here in play is necessarily a realist concept. For the truth of scientific knowledge is, as Gilson puts it:

> the manifestation and declaration of the already realized accord between intellect and being; knowledge results and literally flows from truth as an effect from its cause. And that is why, being founded on a real relation, it has no need to ask how it can rejoin reality.

Yet on the Thomist model, the mere fact of this accord is insufficient to constitute scientific knowledge. For this accord is of a sort which obtains in respect of all animal (i.e. human and non-human) sensations, but only humans are the possessors of scientific knowledge. And, as the Thomists insisted, the generation of scientific
knowledge requires a positive act of the intellect; that
is, an act of self-reflection by means of which the
distinction between sentient subject and sensible object is
constituted. This distinction, generated by a crucial act
of self-reflection, creates the possibility of both
scientific truth and error. Thus, although, in the words
of Aquinas, "sensible object and sentient subject are
actually identical ... they can be thought of apart".11
And precisely in thinking apart sensible object and
sentient subject, the possibility of scientific truth and
falsity is generated. For were it not for this
distinction, we would be left with a kind of 'natural
truth'; we could not achieve the scientific truth of
judgement.

We can now understand enough of the pre-Cartesian notion
of sensation to be able to distinguish it from that
embedded in post-Cartesian philosophy. It is a concept
according to which "the one who sees is assimilated to the
object so that his act of seeing is the same being as the
actuality of the object".12 And any science derived from,
and grounded in, sensation thus construed is necessarily
concerned with things existing in nature. On such a model,
there can be no problem concerning the existence of the
external world - for this is presupposed from the outset.
And because it is not merely presupposed in a unreflective
way, but rather in such a way that it secures what is
required for the possibility of knowledge, the fact that we
can have any knowledge at all is, as it were, evidence of
the external world. Clearly there is a circularity here, but equally clearly the notion of 'truth' intrinsic to such a model as this is a realist notion. This, then, provides us with some understanding of the target under attack from the first of the skeptical arguments rehearsed in Descartes' First Meditation.

**The Strategy and Tactics of Attack**

The attack is launched, not from a 'God's eye' point of view, but from the perspective of the first person inquirer. Descartes' use of this perspective makes it clear that the crucial question of 'How do I know (as the Thomists claim) that my sensations are reliable in the sense that they provide naturally veridical access to things existing in nature?' is a question of reason rather than faith. That is, it is not a matter upon which the arbitrary powers of the Church, or its sainted authorities, are sought or required. For this question provides the means by which Descartes seeks to generate his radical break from the previously dominant Thomistic tradition in science and philosophy.

Thus commissioned, the skeptical exercise begins with a consideration of beliefs derived from the senses concerning which doubt seems quite impossible. Amongst these, Descartes says, is the belief "that I am here, sitting by the fire, wearing a winter dressing-gown, holding this piece of paper in my hands, and so on" (CSM, Vol 1,13).
Here Descartes has selected for consideration what are arguably the least problematic of our beliefs derived from sensation. For as he says: "how could it be denied that these hands or this whole body are mine?" (CSM, I, 12). Clearly if this non-problematic sort of beliefs prove, after all, to be dubitable, then the reliability of sensation itself must similarly be considered dubitable. As a consequence, any science which is derived from sensation and which purports to yield knowledge of things existing in nature, must be rejected as dubitable. For clearly if sensation does not provide naturally veridical access to things existing in nature then, on the Thomists' own terms, scientific error would be incorrigible and (possibly) endemic to the whole edifice of science.

For this reason, Descartes does not concern himself with more problematic sensory perceptions such as, for example, those respecting "objects which are very small or in the distance" (CSM, 2, 17). And by taking only the least problematic of sensations, Descartes effectively blocks one of the more common defences of sensation; namely, that of ascribing to some sensations a privileged status which enables them to be used to correct error - as for example, the error involved in perceiving a stick in water to be bent can be corrected by appeal to other sense perceptions. Thus, Descartes repeatedly insists that the beliefs he is considering are those concerning which doubt seems impossible.
The impossibility of doubting certain of our beliefs derived from sense seems to be confirmed as Descartes continues. For, initially at least, it seems that the only way we can doubt them is to assume that we are insane; or to liken ourselves to madmen... whose brains are so damaged by the persistent vapours of melancholia that they firmly maintain they are kings when they are paupers, or that their heads are made of earthenware, or that they are pumpkins, or made of glass. (CSM, 2, 13)

With this passage Descartes apparently introduces his first challenge to the reliability of sensation. However, this challenge can readily be dismissed by the Thomist on the ground that the sensations of madmen are, by definition, corrupt or 'unnatural'. It is this open to the Thomist to maintain that while sensation is naturally veridical, those whose sensations are not veridical are classified as madmen and as 'unnatural'. This challenge then, does not succeed. And this Descartes himself clearly acknowledges when, referring back to those whose 'brains are damaged', he concludes: "But such people are insane, and I would be thought equally insane if I took anything from them as a model for myself" (CSM, 2, 13). This argument, then, serves only to bolster the claim that the beliefs under consideration are impossible to doubt.

Having thus established the non-problematic nature of these beliefs, Descartes launches his real challenge. For, he points out that when dreaming, people who in every respect appear quite sane, experience 'sensations' no less
improbable than those experienced by madmen. He says:

How often, asleep at night, am I convinced of just such familiar events - that I am here in my dressing-gown, sitting by the fire - when in fact I am lying undressed in bed! Yet at the moment my eyes are certainly wide awake when I look at this piece of paper; I move my head and it is not asleep; as I stretch out and feel my hand I do so deliberately, and I know what I am doing. All this would not happen with such distinctness to someone asleep. Indeed! As if I did not remember other occasions when I have been tricked by exactly similar thoughts while asleep! As I think about this more carefully, I see plainly that there are never any sure signs by means of which being awake can be distinguished from being asleep.

(CSM, 2, 13)

The Historical and Philosophical Dialectic

It is often held that the point of this passage is to bring into focus the question: "How can I tell whether I am awake or dreaming?", and Descartes' argument has been much criticised on this ground. Norman Malcolm, for example, has suggested that this "famous philosophical question" is un-answerable and thus non-sensical. Against Malcolm, Kenny holds that it is a genuine question but one Descartes is unable to answer in Meditation One. However, the answer to this question is subsequently given in Meditation Six where Descartes draws on memory as a means by which to distinguish dreaming from waking experiences. There he says:

... I now notice that there is a vast difference between the two, in that dreams are never linked by memory with all the other actions of life as waking experiences are. If, while I am awake, anyone were to suddenly appear to me and then disappear immediately, as happens in sleep, so that I could not see where he had come from or where he had gone to, it would not be unreasonable for me to judge that he was a ghost, or a
vision created in my brain, rather than a real man.
(CSM,2,62)

Why Descartes could not have said this in Meditation One is unclear. Frankfurt has argued\textsuperscript{15} that this is because Descartes was relying on a more or less naive use of the senses in Meditation One and thus had nothing else available by which to distinguish dreaming from waking. And this because the reliability of memory is established only subsequent on the existence of a non-deceitful God. But despite Frankfurt's best efforts to defend Descartes, the claim that, at the outset of Meditation One Descartes was entitled not only to appeal to, but to rely on, the senses, but on the other hand was unable even to appeal to memory, seems decidedly arbitrary. For if Descartes is not entitled in Meditation One to appeal to memory before establishing, in Meditation Three, the existence of a non-deceitful God, why then should he be entitled to appeal to, much less rely on, a more or less naive use of the senses in Meditation One? Furthermore Descartes was, as we have seen, well able to distinguish himself from madmen and to assert his sanity. And although he does not tell us how he was able to do this, it seems reasonable to suppose he could not have done it by relying entirely on a more or less naive use of the senses.

This whole line of approach which focuses exclusively on the question of whether 'I can distinguish dreaming from waking', seems fraught with difficulties. As one problem is resolved, another emerges and thus Descartes' whole
approach seems vulnerable to the objection of absurdity and incoherence. It therefore seems incumbent on us to wonder whether we have not, perhaps, just missed the point of Descartes' argument.

It is, however, certain that Descartes sees some problem about criteria by means of which to distinguish dreams from genuine sense experiences. The question is why should this constitute a problem? Why doesn't Descartes at least progress (if not resolve) the problem by making appeal to memory? For even if Descartes is not entitled to assume the reliability of memory at this stage, there seems to be no reason why he could not have indicated that we can look to memory to provide the means by which to distinguish between dreaming and waking.

These difficulties can, however, be cleared away simply by viewing Descartes' argument as challenging the Thomist claim that sensation provides us with naturally veridical access to the source and foundation of knowledge; namely, sensible objects existing in nature. For the difficulty Descartes' argument poses for the Thomist is this: if the apparent 'sensations' we have when dreaming are indistinguishable from those 'real' sensations we have when awake, and the 'sensations' we have when dreaming are nothing but impressions in consciousness, how then is it possible to claim that sensation, properly so called, involves an ontological accord of the intellect with the being of sensible objects? Furthermore, even if we were to
concede (for the sake of the argument) that 'non-dream'
sensations stand in a real relation to the being of
sensible objects, if the Thomist cannot show us how to
distinguish between the apparent 'sensations' we have when
asleep (which are admittedly merely psychic events or
impressions in consciousness) and the sensations we have
when awake (which involve an ontological accord of the
intellect with the being of sensible things), then it may
be that error is endemic to the whole body of knowledge
purportedly derived, by means of sensation, from things
existing in nature.

Aquinas himself seem unable to provide assistance at
this point. For although he distinguishes between sensory
experiences and imaginary experiences, this distinction
does not enable us to draw the requisite distinction
between dreaming and waking. For on the criteria provided
by Aquinas for distinguishing sensory from imaginary
experiences, dreaming must be construed as a sensory
experience. The difficulty is that is absurd to suggest
that dreaming involves the same sort of ontological accord
of sentient subject and sensible object that is involved in
sensing.

Aquinas argues that, unlike sensations, images "can
arise in us at will, for it is in our power to make things
appear, as it were, before our eyes - golden mountains for
instance, or anything else we please. 16. Further, he says:
when we sense any sensible object we affirm that it is
such and such, but when we imagine something we make no such affirmation; we merely state that such and such seems or appears to us.\textsuperscript{17}

Clearly, on these criteria, the experiences we have when dreaming must be counted as sense experiences. For they do not arise in us at will, and we immediately take them as real and true. This, Aquinas himself appears to acknowledge when he says that:

\begin{quote}
In these cases the intellect ceases to control the imagination with the result that men take their imaginary representation as truth.\textsuperscript{18}
\end{quote}

However, if the truths of science are derived by means of sensation from things existing in nature, but we cannot reliably distinguish those experiences which are properly counted as sense experiences from those which are not, then, on the Thomists’ own terms, the reliability of scientific knowledge must be considered highly questionable. The heart of the difficulty here confronting the Thomist is that he cannot self-consistently offer any criteria by which the knowing subject can distinguish between experiences of sense and of imagination. Memory is certainly of no assistance here. For memory clearly cannot enable us to distinguish experiences which involve an ontological accord of sentient subject with sensible object from those which do not. Accordingly, Descartes does not here invoke the notion of memory; and this not because he cannot at this stage assume the reliability of memory, but because it is in any case of no assistance whatsoever to his Thomist opponent.
Furthermore, it is clearly not possible for his Thomist opponent to appeal to any sensory experience as a criterion for distinguishing between experiences of sense and of imagination without begging the very question here at issue. For in order to use any sense experience as a criterion, it must first be established that it is a sense experience and not an experience of the imagination, but in order to establish this we first know how sense experiences are distinguishable from those of the imagination, and so on. To avoid an infinite regress, some criterion other than sense must be found. But if the Thomist does discover some such non-question-begging criterion, it follows that we must have some knowledge which is logically prior to and independent of sensation. From this, on the Thomists' own terms, it follows that either the created order of sensible objects is not the source and foundation of all ordinary human knowledge or, alternatively, that sensation is not the only means by which we ordinarily gain access to the created order of sensible objects.

This consequence is not unacceptable either to Cartesian rationalism or to post-Cartesian empiricism. For, as we shall later see, on Descartes' view our knowledge of the created sensible order is secured by perceptions of the intellect rather than of sense. And of course, for post-Cartesian empiricism, it is the sense impression rather than the sensible object that is the source and foundation of all ordinary human knowledge. By contradistinction, the Thomist meanwhile is impaled on the horns of a dilemma. If
he cannot reliably distinguish sensations (or experiences which involve an ontological accord of the intellect with the being of sensible objects) from imaginings, then scientific error may be not only endemic but incorrigible. On the other hand, if the Thomist does provide the requisite non-question-begging criteria, then the foundational claim of Thomist science is thereby destroyed; viz., that sensible things existing in nature are the source and foundation of all knowledge. In short, the doubts raised by this skeptical argument can be resolved by the Thomist only at the cost of those principles which form the foundation of Thomist science.

Treated as a skeptical attack on the foundations of Thomistic science we see therefore both that, and how, Descartes' Dreaming Argument becomes not only intelligible, but very much historically and philosophically significant. Descartes is in fact, as he appears, employing the notion that any (or even all) of experience may be a dream when he says:

> Suppose then that I am dreaming, and that these particulars - that my eyes are open, that I am moving my head and stretching out my hands - are not true. Perhaps, indeed, I do not even have such hands or such a body at all. (CSM, 2, 13)

But this is no pointless absurdity. For by this means Descartes is advancing the now familiar claim that sensations are nothing but impressions in consciousness and, in this crucial respect, indistinguishable from the imaginary experiences we have when dreaming. Thus, taken
as raw experiences, experiences of sense collapse into those of the imagination and the post-Cartesian tradition in empiricist philosophy is born. At the same time, the Thomistic concept of sensation is exposed as untenable and the notion of *veritas est adequatio rei et intellectus* has inevitably come, post-Descartes, to be treated as if it "involved a comparison between the representation of a thing and this mere phantom, which is all the thing outside the representation can be for us" 19.

By accepting (at least in broad terms) the interpretative model I have developed and employed here, the difficulties traditionally associated with Descartes' Dreaming Argument are dissolved at a stroke. For such difficulties arise out of an interpretative framework according to which Descartes' arguments are assimilated into a post-Cartesian context and considered in abstraction from the major pre-Cartesian traditions in philosophy and science. By changing this interpretative framework, not only are these difficulties removed but, further, we see laid bare the process by which the pre-Cartesian Thomist concept of sensation was overturned and replaced by our modern post-Cartesian concept of sensation.

Thus I have argued that Descartes' Dreaming Argument is best understood, not as an argument which moves from premise to conclusion, but as a dialectical argument which challenges and throws into doubt the foundations of Thomistic philosophy and science. Conceived in this way,
the so called Procedural Objection to the argument (which forms the basis of Curley's interpretation) is exposed as innocuous and generated by a misunderstanding of the point of Descartes' argument. According to this objection, the argument is to be rejected on the ground that:

- If the conclusion of Descartes' argument were true, he could not assert its premise. So if the argument were correct, it would defeat itself by removing the ground we are supposed to have for accepting the conclusion.

However, far from rejecting Descartes' argument on this ground, it can now be seen that it is precisely because that Thomist cannot admit there is no intrinsic difference between dreaming and waking, without also admitting that we can never be certain that any of our sense experiences are veridical, that he is forced to give up the original claim that we can be certain that at least some of our sense experiences are veridical. Thus, as Frankfurt rightly points out, the argument is a reduction to absurdity of one kind of empiricism. But, pace Frankfurt, this 'kind of empiricism' is no 'straw man' set up only to be knocked down, but one whose credentials had been recognized and accepted over centuries of philosophical debate.

Thus, it is crucial to recognize that the point of Descartes' argument is not so much to show that there are no marks by which we can distinguish between dreaming and waking experiences; rather, it is to throw into question the Thomist concept of sensation by showing that the experiences we have when dreaming and when awake are
indistinguishable in the crucial sense that all alike may be impressions in consciousness which involve no ontological accord of the intellect with the being of sensible objects. This indeed is the point made by Descartes when, reflecting in Meditation Six on his reasons for doubting beliefs derived from sensation, he says:

The first was that every sensory experience I have ever thought I was having while awake I can also think of myself as sometimes having while asleep; and since I do not believe what I seem to perceive in sleep comes from things located outside me, I did not see why I should be more inclined to believe this of what I think I perceive while awake. (CSM,2,53)

Thus, although Descartes subsequently discovers marks by means of which to distinguish between the experiences we have when dreaming and those we have when awake, he never does claim that the experiences we have when awake (as distinct from those we have when asleep) involve some sort of ontological accord of the intellect with the being of things. That is to say, he never re-establishes the sort of distinction required to secure the reliability of Thomistic empiricism.

Indeed, to the contrary. Descartes not merely accepts, but asserts, that sensations are properly construed as impressions in consciousness and in this crucial respect are indistinguishable from the imaginary experiences involved in dreaming. As a consequence, sensations cannot be held as providing us with naturally veridical access to sensible objects. Thus on the Cartesian (as distinct from Thomistic) model, sensation does not and cannot function to
guarantee the corrigibility of error in science. Rather, says Descartes:

the proper purpose of the sensory perception given me by nature is simply to inform the mind of what is beneficial or harmful for the composite of which the mind is a part; and to this extent they are sufficiently clear and distinct. But I misuse them by treating them as reliable touchstones for immediate judgements about the essential nature of bodies located outside us; yet this is an area where they provide only very obscure information. (CSM, 2, 57-8)

At a deeper level, we can also now see a reversal of philosophical direction - a reversal which gave rise to the problem of the external world. For we have seen that, whereas on the Thomist model the movement is from thing (the source and foundation of all knowledge), by means of sensation, to thought and scientific knowledge, Descartes reverses this direction. His starting point is with thought and thus his philosophy gives rise to the problem of whether, and how, we can move from thought to knowledge of the external world. It is important to recognize that this was not a problem for the classical Greek or pre-Cartesian Christian philosophical traditions just because all knowledge was construed as constituted, in the first instance, by an ontological accord of intellect and mind-independent extants. The fact that it is now a central problem for philosophy is a indication of Descartes' enormous influence on the subsequent history of philosophy.

We can now see yet again just how much turns on this study's central claim that by unreflectively assimilating Descartes' arguments to the controversies of the twentieth
century, we miss not only the subtleties, but the very point of his arguments. For it is now clear just why, abstracted from pre-Cartesian traditions in science and philosophy, Descartes' so-called Dreaming Argument is deprived of its revolutionary importance, its sense and coherence. As a result, its significance for post-Cartesian philosophy is seriously devalued and misunderstood. And if, as Grene suggests, it is time now to move toward a counter-Cartesian beginning, there is manifest benefit in recovering an accurate understanding of the revolutionary strategy developed and so successfully employed by Descartes.
Chapter Three: Footnotes

1. Grene M, Descartes, p3
2. ibid
5. Gilson E, The Spirit of Medieval Philosophy, p237-8
6. Aquinas St Thomas, Summa Theologica, 1A,Q85,Article 2, p 59
7. ibid
8. ibid
9. Gilson E, op cit, p236
10. ibid 238 (my emphasis)
11. Aquinas, De Anima, p529
12. ibid, p531
13. see Kenny A, Descartes, 29
14. Kenny A, op cit
15. Frankfurt H, Dreamers, Demons and Madmen
16. Aquinas St Thomas, op cit
17. ibid
18. ibid
19 Gilson E, op cit, p36

20 For a discussion of this objection see Curley E, Descartes Against the Skeptics, Chapter 3.

21 Frankfurt H, op cit, p50-53.

22 Grene M, op cit, chpt 8
Chapter Four

THE DEceiver ARGUMENT

The Problem

Lying at the heart of the difficulty involved in the explication of Cartesian philosophy is the problem of Descartes' so-called Deceiver Argument. In this, the second of the skeptical arguments rehearsed in his First Meditation, Descartes invokes the hypotheses of a malignant demon and deceitful God and, by this means, purportedly throws into question the most simple and basic truths of arithmetic and geometry.

Considered in terms of the twentieth-century debates in the philosophy of mathematics (and logic), it seems extraordinary that Descartes should think, as he apparently does, that the hypotheses of a malignant demon or deceitful God should have the effect of rendering the truths of mathematics dubitable. For within our modern framework, the truths of mathematics demonstrably do not depend for their determination on God, nor do they in any other way involve the existence of God. Thus we might well say, 'What is it to us, as regards the truths of mathematics, whether or not God exists and is deceitful?' The issue is surely spurious in the extreme.
It is thus that some ingenuity is required to understand why anyone should ever have supposed that the hypothesis of a deceitful God should render dubitable simple and basic truths or propositions of mathematics. However, given that Descartes certainly is of the view that his Deceiver Argument is genuinely successful and that he holds that mathematics is a science grounded in and derived from human reason, we naturally assume that the Deceiver Argument, ipso facto, involves an attack on the reliability of reason. Yet if we assume that, at least on Descartes' own terms, the reliability of reason is thus thrown into question, problems immediately ensue. For Descartes thereby cannot self-consistently rely on reason for his subsequent proceedings in the Meditations. Nonetheless, this he manifestly does.

A mistake as blatant as this, as Harry Frankfurt remarks in a similar context, is hardly the mark of one who would be listed amongst the greatest thinkers. Thus it seems incumbent upon us to wonder not merely if the argument might not somehow turn out to be much sounder than it looks, but whether we have not in fact entirely missed its point. It is precisely these two related thoughts which I intend to pursue here.
The Target

We have seen in Chapter Three that Descartes' first skeptical argument - the Dreaming Argument - both preys on and destroys the theoretical foundations of the Aristotelian tradition in science and philosophy. In this Chapter, I will argue that Descartes' second skeptical argument - the so called Deceiver Argument - deals in an exactly similar fashion with the theoretical foundations of Christian neo-Platonism. Thus I will show that although the Deceiver Argument involves an attack on the reliability of reason, the concept of reason which is here in question is, and must be recognized as, crucially distinct from our modern concept. Consequently, it is as misleading to construe this argument as involving an attack on our modern notion of reason, as it is to construe Descartes' Dreaming Argument as involving an attack on our modern notion of sensation. In demonstrating this, this study's principal corrective intent as regards the explication of the arguments of the Meditations will once again reveal its force and vitality.

However, the situation we face in respect of Descartes' Deceiver Argument is both complex and confused. For by the time in which Descartes was writing, the rationalist tradition which originated with Plato had been variously assimilated into, and subsumed by, the dominant Thomistic empiricist tradition. As a consequence, by Descartes' time
it is not so easy to identify the sorts of knowledge claims that survive the destruction of the foundations of Thomistic science. However, it is clear that even given the unreliability of the senses, some knowledge claims can survive. Paradigmatically, the truths of mathematics seem to stand regardless of whether or not the senses provide reliable access to mind-independent objects. And although other 'truths' may similarly be held to survive Descartes' first skeptical argument, if the truths of mathematics can now be shown to be derived from what is dubitable, nothing, it seems, can remain. The question then is this: 'On what can the truths of mathematics be grounded if not on the reliability of the senses?'

One way of cutting through to the heart of this issue is to disregard the process by which the Platonist tradition had been grafted onto and assimilated into Thomistic science and philosophy, and to focus instead on the bare essential elements of pre-Cartesian rationalism as set forth by its greatest exponent, St Augustine. For in this way we can not only see why the truths of mathematics can be held as surviving any doubt concerning the reliability of the senses, but further, we can see in what sense Descartes' Deceiver Argument undermines the reliability of reason. And in what follows, I will show that while Descartes' Deceiver Argument is precisely constructed to destroy the foundations of Christian neo-Platonic science it does not, by that token, similarly destroy or throw into question the reliability of reason in the sense in which
The Objects of Mathematical Knowledge

Referring to his earlier argument concerning the reliability of the senses, Descartes begins:

So a reasonable conclusion from this might be that physics, astronomy, medicine, and all other disciplines which depend on the study of composite things are doubtful: While arithmetic and geometry and other sciences of this kind, which deal only with the simplest and most general things, regardless of whether they really exist in nature or not, contain something certain and indubitable. For whether I am awake or asleep, two and three added together are five, and a square has no more than four sides. It seems impossible that such transparent truths should incur any suspicion of being false. (CSM, 2, 14)

From this it is clear enough that Descartes recognizes that some knowledge - namely, knowledge concerning simple and universal things which do not necessarily exist in nature - is not thrown into doubt by his earlier attack on the reliability of sensation. Thus it seems reasonable to suppose that this knowledge is of a sort which depends not on the reliability of sensation, but on the reliability of reason.

So far, so good. But if we are to understand in what sense the reliability of reason is in question, we must first clearly understand the status of these 'simple and universal things which may not exist in nature'. In the post-Cartesian context we tend to think of the distinction between things existing and not existing 'in nature' in
terms of the distinction between mind-independent and mind-dependent objects — that is, in terms of objects which are or are not merely a function of the mind of the knowing subject. Thus we tend to assume that, since Descartes speaks of the 'simple and universal things of which arithmetic and geometry treat' as things which 'may not exist in nature', these things are to be understood as somehow residing, first and foremost, in the mind of the knowing subject. But herein lies our mistake.

For the destructive aspect of Descartes' revolutionary strategy cannot be understood in terms of any such assimilation of Cartesian thought into modern philosophy. And if, instead of thus assimilating Cartesian thought unto a post-Cartesian framework, we consider it in terms of a pre-Cartesian framework, the relevant distinction here in question is not that of mind-independence and mind-dependence, but that of the Christian creature/Creator distinction. For on the pre-Cartesian model, it was commonly accepted that there are two basic categories of being; namely, the necessary, eternal and immutable being of God, and the contingent, mutable and created being of things 'existing in nature'. And in terms of this distinction, it is clear that anything which is mind dependent falls into the general category of things which 'exist in nature'. By contradistinction, the simple and universal things of which mathematics treats and which 'may not exist in nature', must reside, first and foremost, in the divine being of God. They are 'of' the Creator rather
than the creatures. And it is vital to keep this most clearly in mind when considering the question of why the hypothesis of a deceitful God should be supposed to render dubitable the 'simple truths of arithmetic and geometry'.

For given that, although not necessarily existing in nature, the simple and universal things of which arithmetic and geometry treat are nonetheless mind-independent objects, it is clear that it is possible to doubt the simple truths of mathematics without, at the same time, necessarily casting doubt on the reliability of reason. For such a doubt would essentially involve accepting the (metaphysical) possibility that our simple ideas of arithmetic and geometry do not stand in a relation of conformity (or something of that sort) with objects existing outside the mind and thus, that they may be in this sense false. And this, as is amply evidenced by the contemporary realist/anti-realist debate concerning mathematical truth, does not necessarily involve any doubt concerning the reliability of reason.

The Reliability of Reason

However, it is vital to note that the question of whether or not Descartes' doubt concerning the truths of mathematics involves any doubt concerning the reliability of reason, turns on the sense in which reason is supposed to be reliable. For if, contrary to modern custom, habit and tradition, we were to take it that reason is supposed
to provide us with immediate and reliable access to mind-independent objects, then Descartes' doubt concerning the truths of mathematics can properly be described as rendering dubitable the reliability of reason: and this in precisely the same sense as that in which we have seen Descartes' Dreaming Argument earlier rendered dubitable the reliability of the senses.

On the other hand if, in accordance with modern practice, we refrain from assuming at the outset a realist notion of mathematical truth, and do not simply take it that the simple and universal things of which arithmetic and geometry treat are mind-independent objects, it is, to say the least, difficult to see why the hypothesis of a deceitful God should ever be supposed to render dubitable mathematical truth. For since a deceitful god (or malignant demon) presumably exists outside the mind, and the truths of mathematics stand independent of anything outside the mind, we might well claim that not even these hypotheses are sufficient to cast into doubt mathematical truth. Certainly, such hypotheses are of no concern to the mathematical anti-realist who holds that mathematical truth is a human construct which stands regardless of what, if anything, exists outside the mind. Furthermore, even were we to grant that the Deceiver Hypotheses are at least supposed to throw into doubt mathematical truth thus construed, it is difficult to understand what such a doubt would amount to. Certainly it would seem to involve some doubt regarding the reliability of reason but, at the same
time, it invites the question of what, in this context, is it for reason to be unreliable? One possibility clearly might be that reason provides no reliable criteria by which to distinguish the true from the false and thus that the truth-preserving nature of deductive reasoning can be doubted. However, this doubt is clearly quite distinct from any doubt as to whether reason provides immediate and reliable access to mind-independent objects. And, prima facie, Descartes never doubts the truth-preserving nature of deductive reasoning, nor does he ever doubt that reason provides reliable criteria by means of which we can distinguish between the true and the false. Indeed, Cartesian philosophy not only relies on the truth-preserving nature of deductive reasoning, but Descartes explicitly asserts that the faculty for distinguishing between the true and the false is given with the mind. Thus it is not at all clear why Descartes' Deceiver Hypotheses should be supposed to throw into doubt the reliability of reason thus construed. Indeed, this is intelligible only if Cartesian thought is so assimilated into post-Cartesian philosophy that we no longer recognize the nature of the change it brought about in the way the 'reliability of reason' is understood.

**Descartes' Quarry**

In short, then, there is a strong prima facie case that Descartes' Deceiver Argument assumes (i) a realist notion of mathematical truth; and (ii) that reason (rather than
the senses) is supposed to provide reliable access to the objects of which arithmetic and geometry treat. And, while these objects are not necessarily sensible objects which 'exist in nature', they are, nonetheless, mind-independent objects.

Here, it is germane to recall that the claim that sensible reality is not the 'true' reality was not first introduced to the world by Christian thinkers and does not depend on the Christian creature/Creator distinction. We all think of Plato, and the way in which he subordinates things to their Ideas. The latter are regarded as eternal and immutable, and thus they 'really are'; whereas the former are regarded as mutable and perishable; they are 'as if they were not'. And for the Platonist and neo-Platonist tradition of medieval Christian Europe, mathematical truth was understood as derived from some sort of conformity of thought with what 'really' exists - namely, the necessary, eternal and immutable Forms or Ideas. On this model, necessary truth is constituted ontologically as Truth - a classic Platonist icon.

In line with classical Greek thought, sensible things were thought of within the medieval Christian context as involving a composite of Form and matter. The existence of such things was regarded as (ipso facto) suspended from the divine will and shot through with contingency. By contrast, the Forms or Ideas were regarded as simple and universal things whose existence is necessary, eternal and
immutable. It is thus certainly the case that Descartes' Dreaming Argument throws into question our knowledge of composite sensible objects, and thus leads to the conclusion that "physics, astronomy, medicine and all other disciplines which depend on the study of composite things, are doubtful" (CSM, 2, 14). But crucially, this does not mean that any science which takes as its object the simple and universal things (i.e. Forms or Ideas) which are the objects of mathematics, is similarly exposed as dubitable and uncertain. For, as Descartes says:

> arithmetic, geometry and other subjects of this kind, which deal only with the simplest and most general things, regardless of whether they really exist in nature or not, contain something certain and indubitable. (CSM, 2, 14).

That is to say, on the pre-Cartesian model, the certainty of mathematics does not, in the last analysis, necessarily depend on the created order of sensible objects, or on things which exist 'in nature'. The certainty of mathematics does, however, necessarily involve the mind-independent existence of mathematical objects; viz., those simple and universal things which, so to speak, precede the divine act of creation. Knowledge of such objects is constitutive of Platonist and Christian neo-Platonic science. Thus, whereas on the Aristotelian/Thomist model knowledge of truth involved knowledge of the created order of sensible objects, on the Christian neo-Platonic model it was construed as involving knowledge of necessary, eternal and immutable Being which, in its turn, was
construed as the source and foundation of our 'knowledge' properly so-called.

Thus for Augustine and, following him, the Christian neo-Platonist tradition, truth is necessary, eternal and immutable but, since there is nothing necessary, eternal and immutable to be found in the created order of sensible objects, sensible objects cannot constitute the source and foundation of knowledge. As Augustine explains:

Whatever is attained by sense, what we call the sensible, never for an instant ceases to change. It matters not what age the body has attained; whether the hair on the head be ungrown, whether it be in the bloom of youth or verging on old age; always it is in a state of uninterrupted becoming. Now what does not remain constant cannot be perceived; for to be perceived is to be comprehended by science, and the perpetually changing cannot be comprehended. From our corporeal senses, then, no genuine truth is to be looked for.2

On this model, our knowledge of truth depends not on perceptions of the senses but on perceptions of the intellect. And, unlike the objects of sense perception, the objects of intellectual perception are immaterial, necessary and changeless. And precisely because these objects are necessary and changeless they cannot be held as residing in the human mind. For, the argument goes, the mind, like all created things, is contingent, mutable and enduring in time. And thus, as Gilson explains:

The only way to account for these characters of truth in the human mind is to admit that, every time it forms a true judgement, our mind is so to speak in contact with something that is immutable and eternal. But to say "immutable" and "eternal" is tantamount to saying God.3
With this assimilation of the eternal and immutable into the divine intellect we see the assimilation of Platonic thought into a Christian framework. For the Christian reconstruction of the thought of Plato involved a shift in the locus of the Forms such that they now come to be construed as Ideas in the divine intellect. This is because, as we have seen, on the Christian model what exists must be either part of created being (that is, being which is contingent on the divine will), or it must be 'of' God. These categories are exhaustive: they embrace everything that there is. And since, according to Christian doctrine, the Platonic Forms cannot be both necessary, eternal and immutable and distinct from God, the Forms could only retain such status by becoming 'divinised' - that is, by being absorbed into the divine being and construed as Ideas of God. Thus, all knowledge which is knowledge is now construed as derived ultimately from God.

With this move, a conceptual connection was established between God and necessary truth. And in the light of this connection we can now begin to see why Descartes' hypothesis of a deceitful God should be thought to throw into question the simple and basic truths of mathematics. But to further understand this we need also to comprehend the Christian neo-Platonist account of the path to knowledge - how we come to know the Ideas of the divine mind. For here again, a reconstruction of Plato was required. This was because the Platonic theory of 'recollection' - i.e. that process by means of which our
knowledge of the Forms or Ideas could be explained - is inconsistent with the Christian doctrine of creation. As a result the assimilation of Platonic thought into Christian Europe demanded a reconstruction of Platonic epistemology.

In this reconstruction the Platonic theory of recollection drops out of focus and is replaced by the notion of the intellect as 'illumined' by the divine light of God. That is, as the intellect is quite literally 'enlightened by God', we are enabled to perceive the (necessary, eternal and immutable) objects of true knowledge. Thus, divine illumination came to serve the same function for Christian neo-Platonism as 'recollection' serves for the Platonist: it provides the required explanation of how we come to know Truth or, what is the same thing, the necessary, eternal and immutable reality that is the object, source and foundation of true knowledge.

While this notion of divine illumination lies quite outside the realm of modern science and philosophy, by overlooking this aspect of Christian neo-Platonism thought we are apt to miss the point of Descartes' Deceiver Argument and thus to totally misunderstand the sense in which the reliability of reason is thereby rendered dubitable. But once we think of God as "the Intelligible Sun which enlightens the minds of all men" Descartes' Deceiver Hypotheses are revealed as highly apposite. Furthermore, once we recognize that the position under
attack is one according to which, as Augustine puts it:
"Understanding is the same thing for the mind, as seeing is
for the bodily senses"5, we can see that, although there is
some sense in which the Deceiver Hypotheses render
doubtful the reliability of reason, this does not mean
that we can doubt the truth-preserving nature of deductive
reasoning. For although within the context of twentieth
century philosophy this comment could well be taken as
meaning that the objects of 'the understanding', like the
objects of sensation, are to be understood first and
foremost as thoughts or ideas, within the context of the
medieval Christian debate in philosophy it bears quite the
contrary meaning! For, as Augustine explains:

the objects of our senses, the things we can all see
and hear, colours, sounds which you and I see
simultaneously, belong not to the nature of our eyes
and ears, but are common to us precisely as the
objects of our senses.... Likewise we must not say
that the things which you and I perceive mentally
belong to the nature of our minds. For what the eyes
of two persons perceive simultaneously cannot be
identified as belonging to the eyes of either one or
other, but it must be some third thing to which the
sight of both is directed.6

Of course by breaking down, and away from, this view,
Cartesian philosophy gives rise to the 'problem' of the
subjectivity (or privacy) of experience and its empirical
materialist counter-views, and thus to the basic
distinction between mind-dependent and mind-independent
objects. But Cartesian skepticism preys not on post-
Cartesian problems, but on doctrines embedded in pre-
Cartesian thought. And Descartes' Deceiver Hypotheses are
directed against the Christian neo-Platonic doctrine which holds that, by means of the divine light, the intellect is enabled to perceive the 'Ground of Truth', that is, the necessary, eternal and immutable Forms or Ideas residing in the divine intellect. The model here in question is one which, not unreasonably, can be described as a purely rational *a priori* epistemology. Clearly, however, it is not of the same sort as that subsequently described and developed by Kant. Nonetheless, it is 'purely rational' in the sense that it does not in any way depend on the reliability of sense perception. Rather, in the last analysis at least, it relies solely on the mind's perception of a particular kind of non-sensible object. As for the 'a priori' aspect, this applies because it takes as its object that which is ontologically prior to and independent of the so-called 'created order of sensible objects'.

**The Historical/Philosophical Dialectic**

Thus, it is not altogether wrong to suggest that Descartes' Deceiver Argument is an attack on the concept of a purely rational *a priori* science. But because when we think of such a concept we generally think in terms of Kant, it is misleading to do what is often done and to construe Descartes' Deceiver Argument as an attack on a purely rational *a priori* science. For thus construed, not only is history manifestly violated, but Descartes' argument, and indeed his entire project, is perverted and
made highly problematic. By contradistinction, when
recognized as an attack on Christian neo-Platonism,
Descartes' Deceiver Argument is exposed not only as well
suited to its purpose but as marking a major historical and
philosophical turning point — away from a pre-Cartesian,
and toward a post-Cartesian concept of a purely rational a
priori science. Working on the assumption that God is the
source and foundation of all knowledge and that the simple
and universal things of which arithmetic and geometry treat
are Ideas which fall to the score of the Divine Intellect,
the importance and relevance of the Deceitful God
hypothesis is utterly manifest. For if God is a
Deceiver, then what we perceive by means of divine
illumination will be unreliable in the crucial sense that
such perceptions will not involve any conformity with
'Truth' qua necessary, eternal and immutable Ideas of the
Divine Intellect; they may still be perceptions of God, but
as God is a deceiver, they will be deceitful and false
perceptions; perceptions of falsehoods. Moreover, we will
— because we have, on this model, no possible God­
independent access to 'truth' — never be able to determine
that we are deceived! To admit this, however, is to admit
that error may be incorrigible in the whole edifice of
Christian neo-Platonic science. Thus does Descartes'
Deceiver Argument place a bombshell under the epistemology
of his day.

And neither is the problem here one which can be
resolved simply by embracing aetheism. For even if we move
back to, say, the position of Plato (ipso facto unmodified by Christianity), the mere fact that some ideas, such as our simple ideas of arithmetic and geometry, rule and dominate our mind, is not sufficient to establish that such ideas conform with or correspond to anything outside it. For the hypothesis of a deceitful demon is quite sufficient to account for the appearance of mind-independence in 'truth'. That is to say, the simple ideas of arithmetic may be in our mind because of the activity of a malignant demon - and not therefore because they conform with necessary, eternal and immutable Forms or Ideas as the Platonist or neo-Platonist would maintain.

This line of argument can also be understood as one which strikes at the heart of any proof of the existence of God which takes as its starting point our apprehension of simple ideas of arithmetic and geometry. Such a proof, as Copleston has pointed out, was not only accepted by the Augustinian school but reappears in the thought of Leibniz. This proof, set out by Copleston as follows, works from the claim that truth, such as is comprehended by arithmetic and geometry:

is superior to the mind, inasmuch as the mind has to bow before it and accept it: the mind did not constitute it, nor can it amend it: the mind recognizes that this truth transcends it and rules its thought rather than the other way round. If it were inferior to the mind, the mind could change it or amend it, while if it were equal to the mind, of the same character, it would itself be changeable as the mind is changeable.... 'Hence, if truth is neither inferior nor equal to our mind, nothing remains but that it should be superior and more excellent' (De lib. arbit., 2, 12, 33).
But the eternal truths must be founded on being, reflecting the Ground of all truth. Just as human imaginations reflect the imperfection and changeable character of the human mind in which they are grounded, and as impressions of sense reflect the corporeal objects in which they are grounded, so the eternal truths reveal their Ground, Truth itself, reflecting the necessity and immutability of God.... If there is an intelligible sphere of absolute truths, this cannot be conceived without a Ground of truth, 'the Truth in whom, and by whom, and through whom those things are truth which are true in every respect' (Solil., 1, 1, 3). 7

If the first part of this argument is understood as involving the (essentially negative) realist claim that the truths of mathematics are not constructs of the human mind, this part of the argument remains unchallenged by Cartesian skepticism. The positive claim (which, inter alia, is not necessarily held to only by realists), that such truths rule and dominate our minds and cannot be amended by us, similarly remains unchallenged. But the hypothesis of a malignant demon or evil genius provides an explanation for the phenomenological fact that certain particular ideas rule and dominate our minds. And this explanation is both of a kind with, and an alternative to, the Christian neo-Platonic explanation of this fact 8. Thus it is manifest that the fact that certain of our ideas have a compelling force is not something that entails the existence of anything necessary, eternal and immutable. Consequently, it may be that we are wrong in thinking that the ideas in question are true in the sense that they conform with such objects. In other words, what the hypothesis of a malignant demon throws into doubt is this: (i) the claim that the compelling force associated with simple ideas of
What Can be Doubted

On this construction, Descartes' Deceiver Argument is not the agent of philosophical mayhem which it is often thought to be. But we must be very clear about what the argument does and does not do. It certainly renders dubitable both the claim that our simple and basic ideas of arithmetic and geometry are conformed with the necessary, eternal and immutable Forms or Ideas (which are purportedly the Ground of all truth), and the view that reason provides a reliable means by which we can perceive the necessary, eternal and immutable Forms or Ideas or 'Ground of Truth'. But the fact nonetheless remains that pace the popular view of this aspect of Descartes' project, the Deceiver Argument does not throw into doubt a purely rational a priori science of the sort we characteristically associate with Kant.
The Problem Reconsidered

Wilson has suggested that Descartes' Deceiver Argument "may be characterised without too much hyperbole as the most fundamental Cartesian problem". In the foregoing I have shown that the solution to this problem is to be discovered by firmly situating Cartesian thought within its historical context. For we can thus identify in relatively precise terms, and render intelligible and coherent, the strategic importance of the Deceiver Hypotheses in Descartes' general programmatic.

On the interpretative model I have put forward, the skeptical arguments rehearsed in Meditation One have this in common: each constitutes an attack on a concept of science, or of truth, which is grounded in, secured by, and derived from, the existence of mind-independent states of affairs and/or objects (of whatever kind - God, Forms, sensible things, etc). The first skeptical argument, the Dreaming Argument, analyses and finds wanting the Aristotelian/Thomist claim that sensible, composite or created things which exist 'in nature' are the source of all knowledge, and that knowledge of truth necessarily involves a conformity of the mind, via sensation, with the existence of such objects. With this argument Descartes renders dubitable the whole edifice of Aristotelian/Thomist science.
His second skeptical argument, the Deceiver Argument, takes up the Platonist/neo-Platonist claim that simple and universal things - Forms or Ideas - are the source and foundation of knowledge, and that knowledge of truth involves a conformity of the mind with such objects. Given that such conformity was thought to be in some way established by means of a 'divine light', the hypothesis of a Deceitful God is precisely intended and devised to show that, and how, even given divine illumination, we may be mistaken in thinking that our intellect ever stands in a relation of conformity with the Forms or Ideas. The hypothesis of a malignant demon is similarly designed to show that we have insufficient reason for claiming that in having ideas which 'rule and dominate our minds', the intellect is *ipso facto* 'conformed with eternal and immutable Forms or Ideas'.

Taken together, these arguments challenge the essence of pre-Cartesian epistemology: the view that the foundation, of knowledge is and/or must be external to the mind. In the light of these arguments, any science or body of knowledge grounded in an epistemology which takes as its starting point what is mind-external must be considered dubitable. And thus Descartes concludes the argument of Meditation One by saying:

I will suppose therefore that not God, who is supremely good and the source of truth, but rather some malicious demon of the utmost power and cunning has employed all his energies in order to deceive me. I shall think that the sky, the air, the earth,
colours, shapes sounds and all external things are merely the delusions of dreams which he has devised to ensnare my judgement. I shall consider myself as not having hands or eyes, or flesh, or blood or senses, but as falsely believing that I have all these things. I shall stubbornly and firmly persist in this meditation; and, even if it is not in my power to know any truth, I shall at least do what is in my power, that is, resolutely guard against assenting to any falsehoods, so that the deceiver, however powerful and cunning he may be, will be unable to impose on me in the slightest degree. (CSM 2, 15)

Within the context of the medieval Christian debate in science and philosophy, the claim that there may be no objects external to the mind amounts to the claim that all "scientific" knowledge is dubitable. And in as much as all such knowledge was, at least theoretically, grounded in external objects, Cartesian skepticism can properly be characterised as invoking wholesale destruction of the medieval Christian sciences. Any new foundation for science established in the light of the sceptical arguments of Meditation One clearly cannot take as its starting point objects which exist outside the mind. Correspondingly, to re-establish a system of knowledge recognizable as scientific knowledge, the problem Descartes thereby sets himself is that of subsequently re-establishing knowledge of mind-independent objects. (For it is not his intention to reduce (his) philosophy to wallowing in the cess pits of psychologism or skepticism.) Thus, whereas in the pre-Cartesian period the movement is from object to idea, or from thing to thought, in the post-Cartesian period it is the other way about: the movement is from thought to thing, or from the idea to the object existing outside the mind or intellect.
And it might further be remarked that only in as much as
Descartes is able to secure the move from 'thought to
thing', and thus to re-establish knowledge of what exists
independent of thought, can he claim to have re-established
science on a firm and certain foundation. Of course
Descartes does not re-establish science all in one blow.
Rather, he establishes, first, a new concept of the mind.
That is, going straight to the heart of the problem he
argues first, that the mind cannot be construed as if its
essence lies in capacity to 'become conformed' with the
existence of mind-independent things (or to become all
things by way of representation). Instead, the mind must
be understood as that, the essence of which is to think.
And with this move the Christian creature/Creator
distinction drops from focus and the philosophical
spotlight shifts onto the distinction between mind-
dependent and mind-independent objects. Indeed, the
importance of this latter distinction in our contemporary
universe of philosophical discourse is a major indicator of
the efficacy of Cartesian philosophy.
Chapter Four: Footnotes

1. Frankfurt H G, 'Descartes on the Consistency of Reason', in Hooker M (ed), Descartes, 26

2. St Augustine, De Div Quaest, 83, quoted from Gilson E, The Spirit of Mediaeval Philosophy, 230

3. Gilson E, History of Christian Philosophy in the Middle Ages, p76

4. ibid. p76-77

5. St Augustine, de ord 113.10 - PL 32.999

6. St Augustine, De Libero Arbitrio, II 12.33 - PL 32.12591; see also DE IMM AN 6.190- PL32.10256 and DE TRIN XII 14.23 - PL 42.1010-11


8. It is of relevance here to note that in his History of Philosophy in the Middle Ages (p453), Gilson indicates that the notion of a deceitful God is suggested by Rodington. For Gilson ascribes to Rodington the view that "it is always possible for [our intellect] to be deceived because it is always possible for God to make a thing appear to be another one". Thus it may be that Descartes' Deceiver Argument has its origin in the fourteenth century Augustinian School of Thought.

9. Wilson M, Descartes, p31
Any successful revolutionary strategy involves two essential elements: a destructive element; and thereafter one that is constructive. For if the old is not replaced by something new it will, for want of anything better, simply be rebuilt. This applies as much to philosophy as to politics. In the preceding chapters we have seen that (and how) the sceptical arguments of Meditation One serve the destructive objectives of the Cartesian revolution and, as such, cannot be understood except in the light of pre-Cartesian thought. With Meditation Two, however, there is a change of direction: the arguments of this Meditation are constructive and mark the emergence of a new epoch in science and philosophy. Thus regarded, they represent a major 'paradigm shift' which, importantly, has engendered a shift in our philosophical outlook and given rise to a new, and characteristically modern, conceptual framework. And in order to throw light on the nature of the paradigm shift here in question, it is not inappropriate to draw on those developments in post-Cartesian philosophy which represent a 'working through' of problems associated with the constructive aspects of the Cartesian revolution.

Our point of departure is, however, from the old. And as we have already seen, in the pre-Cartesian medieval
Christian period the nature of the mind was characteristically understood, firstly, in terms of its ability to become identified or conformed with externally extant things and, secondly, in terms of the special nature and ontological status of the those things regarded as the proper or 'natural objects' of the mind and of knowledge. However, just because the skeptical arguments of Meditation One render dubitable our knowledge of all external things, it is apparent that the claim that the essence of the mind lies in its being conformed with external things must now be rejected.

The inauguration of a new, and characteristically modern, conception of the mind - according to which its objects are taken, not as a part of what lies outside the mind, but as objects of the mind itself - begins with the arguments of Descartes' Second Meditation. That is, rather than claiming that the mind is to be understood in terms of the external things to which it is conformable, the arguments of Descartes' Second Meditation present the mind as that which must be understood in and through itself. Thus, in opposition to his predecessors, Descartes insists that the mind possesses an essential autonomy vis-a-vis external things; the mind can no longer taken as determined by, and subject to the 'powers' or operations of, anything beyond or external to itself. Accordingly, it may be said that it is with Descartes that the concept of the human mind 'comes of age' in the sense that it can now be seen as
an independent agent whose actions are both self-determined and self-determining.

This move was one which gave an entirely new impetus to philosophical debate. Indeed, as we will see, much of modern philosophy itself is essentially a 'working through' of the possibilities and problems opened up with the emergence of the Cartesian conception of the mind (in much the same way, that is, that pre-Cartesian philosophy is a Christian 'working through' of classical Greek philosophy). The post-Cartesian rationalist versus empiricist debate is one very prominent way in which the possibilities and problems of Cartesian philosophy are worked through. The contemporary realist versus anti-realist debate is another. The list is long and marked at almost every point by disputes whose significance is acquired as a result of Descartes' problematic legacy.

The question before us now is how this vital philosophical revolution was accomplished. How did Descartes so effectively and radically overturn the past and re-write the philosophical agenda? The answer lies, first and foremost, in the arguments of his Second Meditation. For with this Meditation, the pre-Cartesian claim that the mind is to be understood through what exists outside it, is replaced by a concept of the mind which can be understood without reference to any other thing. And with this move the Greek Form/matter distinction and the Christian creature/Creator distinction is moved off into
the wings and its place on the philosophical centre stage is taken by the modern distinction between mind-dependence and mind-independence.

The Cogito Argument

Meditation Two begins with a brief summary of the position in which Descartes finds himself as a consequence of the arguments of the skeptics rehearsed in Meditation One. Everything, it seems, is to be rejected as doubtful for, as he says: "I have convinced myself that there is nothing in the world, no sky no earth, no minds, no bodies" (CSM,2,16). However, from this, Descartes quickly moves to establish his Archimedean point. He says:

Does it now follow that I too do not exist? No: if I convinced myself of something then I certainly existed. But there is a deceiver of supreme power and cunning who is deliberately and constantly deceiving me. In that case I too undoubtedly exist, if he is deceiving me: and let him deceive me as much as he can, he will never bring it about that I am nothing as long as I think that I am something. So after considering everything very thoroughly, I must finally conclude that the proposition, I am, I exist, is necessarily true whenever it is put forward by me or conceived in my mind. (CSM,2,16-17)

The essence of this, the so-called Cogito Argument, is famously captured in the dictum, cogito ergo sum (which had appeared some three years earlier in Descartes' Discourse).
Inference or Intuition?

Modern commentators have raised serious questions concerning both the formal nature and the formal soundness of this argument. And, just in order that we might recognize the argument as an Archimedean point, these formal questions must be addressed and resolved. For it is only on the basis that Descartes has indeed discovered such a point that we can sensibly progress to consider the peculiar and specific nature of this point. Thus, as Bernard Williams aptly observes:

There is one point ... that cannot be avoided in a discussion bearing on the certainty of the cogito, or at least the Cartesian cogito; namely, whether the proposition "I think therefore I am" is or is not an inference. The truth that emerges from the cogito and that Descartes takes as the foundation stone of the entire system he constructs is, most assuredly, "I exist"; but can we say that there is a logical relation between this proposition and the indubitable proposition "I think" such that Descartes, having reached the point where doubt can go no further, can, in formulating the latter, legitimately infer the former? Or is it, rather, the case that we cannot speak of a logical relation or a principle of inference leading from "I think" to "I exist" but that, in being forced to admit that I think, I am thereby forced to admit that I exist? - with the consequence that "I think therefore I am", in the misleading form of an inference, expresses in fact a single proposition, which is the exact point at which doubt is halted.¹

Succinctly stated then, the crucial question here is: 'What is the relation between cogito and sum?' As Edwin Curley says: "Traditionally, the puzzle takes the following form: is Descartes' knowledge of his existence intuitive or
inferential?\textsuperscript{2}.

Although Descartes explicitly and repeatedly denies that the argument is supposed to be a syllogistic inference\textsuperscript{3}, he sometimes speaks of it in language strongly suggestive of an inference, but at other times in terms suggestive of its being a simple act of intuition. Descartes' use of the particle ergo, for example, implies an inference, but his denial that the reasoning involved is syllogistic, together with his claim that it involves a "simple intuition of the mind"\textsuperscript{4} is often taken as contra-indicative of this.

By and large, commentators have opted for a variant of one or other of these two positions - inference or intuition - and they thereby suggest that Descartes' own representation of his position cannot always be taken literally. Indeed, it is commonly held that Descartes is guilty of some inconsistency in that he (seemingly) claims both that the cogito involves an inference and a simple intuition. Such a charge seems difficult to deny if we distinguish between an 'inference' and an 'intuition' in accordance with the following (archetypal) approaches and hold that:

\begin{enumerate}
  \item the relation between cogito and sum is inferential if the truth of the conclusion (sum) is not immediately given but is derived from that of the premise (cogito), and is therefore established in a different way to that in which the truth or certainty of the premise is established;
\end{enumerate}
b. to say the cogito involves a simple intuition is tantamount to saying, as Ayer puts it, that "there was ... no need for Descartes to derive sum from cogito, for its certainty could be established independently by the same criterion"; the truth of each follows from their being doubted by the person who expresses them (or something of this general sort).

On a construction such as this, Descartes' Cogito Argument is either an intuition or it is an inference; it cannot be both.

The problem of whether the Cogito Argument is to be understood according to this disjunction is an important one. For, as we will see, this question bears on and significantly determines the specific nature of Descartes' Archimedean point. And clearly if this is not correctly and clearly understood, problems will inevitably emerge with respect to Descartes' subsequent arguments. Thus, our present concern must be that of clearing away the misconceptions surrounding this argument and of thereby clarifying the ground from which Descartes subsequently moves to establish knowledge of mind-independent things.

In what follows I will first critically examine Jaakko Hintikka's highly influential account of the Cogito Argument (Hintikka being the champion non-pareil of the
intuitionist view). Our encounter with, and disposal of, Hintikka's approach will not only reveal something of the problems generated by a misreading of this crucial argument but, more importantly, will significantly free us from the dilemma which confronts us when forced to choose between the so-called inferential and intuitionist accounts of the Cartesian Cogito. Guided by Descartes' own account of what is involved in an intuition or 'simple act of mental vision', we will see that in fact there is no tension to be resolved, and thus the intuition versus inference dilemma dissolves. For, far from opposing a 'simple act of mental vision' or 'intuition of the mind' to an inference, Descartes clearly indicates that it is by means of an intuition that we are able to recognize the validity of a simple deductive inference (although not of a complex chain of deductive inferences). Thus we will see that, on Descartes' own terms, to say that the Cogito Argument involves a simple inference is not to deny, but to the contrary, to assert that it involves an intuition.

However, even granted that this dispute can be thus dissolved, there remains something deeply perplexing about the Cogito. But the problem with which it confronts us is manifestly not that of whether it involves an inference or an intuition. Rather, as we will see, it brings into sharp focus the perplexing nature of deductive inference; specifically, the problem of how we are to account simultaneously for its legitimacy and its efficacy. For to focus on what makes the argument legitimate - formally
valid - will seduce us into giving (undue and unwarranted) credence to the charge that the argument assumes what it purportedly establishes. And, approached from the strict angle of formal validity, it appears that the truth of 'the conclusion' can be established in the same way - by the same criterion - as is required to establish the truth of 'the premise(s)'. Thus, the so-called intuitionist account of the Cogito is generated and acquires its plausibility. Yet by focussing exclusively on what makes the argument useful - on the gap between recognizing the truth of the premise and that of the conclusion - the argument is apt to present as logically invalid. And thus Curley, who (as we will see) focuses on the gap between recognizing the truth of the premise and that of the conclusion, holds that the argument is properly understood as involving an inference, albeit that it is logically invalid. Of course the problem of how we are to account both for its legitimacy and usefulness applies to any deductive inference. However, with the Cartesian Cogito Argument, the problem emerges, and is revealed, in its most acute form. And, as we will see, in explaining this argument, Descartes anticipates and foreshadows aspects of the post-Cartesian debate surrounding the perplexing nature of deductive reasoning and the question of what makes it possible at all.

The Cogito as an Intuition

Hintikka's interpretation of the Cogito Argument is
commonly considered the most sophisticated of the so-called 'intuitive accounts'. In no small measure, and somewhat ironically, this is (as we will later see) because it comes close to effecting an inferential account. Where Ayer claims\(^7\) that the truth of both *cogito* and *sum* follow from their being doubted by the person who expresses them, Hintikka claims that the Cogito Argument turns on what he describes as an 'existential inconsistency'. This notion, he defines as follows:

\[\text{let } p \text{ be a sentence and } a \text{ a singular term (e.g. a name, a pronoun or a definite description). We shall say that } p \text{ is existentially inconsistent for the person referred to by } a \text{ to utter if and only if the longer sentence } \ldots "p; and } a \text{ exists} \ldots \text{is inconsistent (in the ordinary sense of the word).}\]

An example clarifies the point: an 'existential inconsistency' would exist if, say, Charles De Gaulle were to have uttered the sentence 'De Gaulle does not exist'. The inconsistency here in question is not to be discovered in the sentence itself but in the utterer's utterance of that sentence: the inconsistency is a function of the pragmatic constraints operating upon the statement; it is not a function of semantic factors alone. Rather, an 'existential inconsistency' involves and inheres in the performative dimension of an utterance (or thought), viz., the performance or act that is involved in making a certain kind of (self-referential) statement. For, and crucially, it is precisely in the act of saying (or thinking) 'that p' the utterer/thinker thereby refutes what 'p' asserts (cf. the sentence 'Don't read this sentence').
Now on Hintikka's view an understanding of the Cogito Argument requires that we accept it as involving a performance (in the technical and pragmatic sense of 'performance' here in question). By focussing on this aspect of the argument, Hintikka suggests we can begin to see why, at times, Descartes describes the Cogito as if it involves an inference and at other times as if it involves an intuition. He says:

Descartes realized, however dimly, the existential inconsistency of the sentence "I don't exist" and therefore the existential self-verifiability of "I exist". *Cogito, ergo sum* is only one possible way of expressing this insight. Another way actually employed by Descartes is to say that the sentence *ergo sum* is intuitively self-evident.9

Thus, according to Hintikka, Descartes' use of the term *ergo* indicates that there is a sort of 'performance' involved in the Cogito Argument (although not the sort of 'performance' involved in an inference). Thus Hintikka denies that the relation of *cogito* to *sum* is that of a premise to a conclusion. "Their relation" he says, "is rather comparable with that of a process to its product."10 For his view is that the starting point of the Cogito is with the apprehension of an existential inconsistency, rather than with the recognition of the truth of a(ny) premise. Correspondingly, the term *cogito* in the dictum *cogito ergo sum* does not, modulo Hintikka, function as a proposition and cannot therefore be construed as a premise. Rather, it refers to the 'performance' - the act of thought.
or speech - in and through which, on pain of existential inconsistency - the guarantee of the truth and/or certainty of the proposition 'I exist' manifests itself.

For Hintikka, then, the recognition of the truth of the proposition 'I exist' is not derived by means of deductive inference from the truth of the proposition 'I think'. Rather, the truth of the proposition 'I think' can be established in precisely the same way as the truth of the proposition 'I exist'. For in just the same way that there is an existential inconsistency in thinking 'I don't exist', there is an existential inconsistency in thinking 'I don't think'. (This is, en passant, why Hintikka's account of the Cogito Argument can be classified as a version of the so-called intuitionist account.)

But clearly, if the Cartesian Cogito turns on the threat of such an existential inconsistency, the question must arise of how we could be certain that the threat is a real one. To establish the required certainty, the term 'I' must have a guarantied reference in the dual sense that (a) it can never lack a bearer, and (b) we can never mistakenly 'get hold' of the wrong thing as its bearer. In the case of the sentence 'De Gaulle does not exist', we can be certain that an existential inconsistency exists if and only if we are assured that (a) the term 'De Gaulle' cannot lack a bearer, and (b) we cannot be mistaken in thinking that it is he, De Gaulle, and not some other, who has uttered the statement 'De Gaulle does not exist'. In this
way we can see at once that there are considerable problems in ascertaining if, or that, there is an existential inconsistency involved in any given utterance of the statement 'De Gaulle does not exist'. Similarly, in the case of the sentence 'I do not exist', an existential inconsistency can be established if, and only if, the term 'I' has a guarantied reference in the dual sense that it can never lack a referent and that it is impossible to mistakenly 'get hold' of the wrong referent.

Of course, it may be objected that it would be an excess of skepticism to doubt that the term 'I' has a guarantied referent in the double sense necessary to establish an existential inconsistency. But if we take it that the term 'I' has a guarantied reference in the requisite double sense, Descartes has no need to rely on an existential inconsistency to establish the truth of the proposition 'I exist'. For the truth of this proposition can be established simply by reference to the semantics of the first person pronoun.

This I take to be Hintikka's point when he says:

Descartes' *cogito* insight therefore depends on "knowing oneself" in the same literal sense in which the insight into the self-defeating character of the statement "De Gaulle does not exist" depends on knowing De Gaulle. Expressed in less paradoxical terms, appreciating the *cogito* argument pre-supposes an ability to appreciate the logic of the first person pronoun "I".11

Hintikka is not claiming here that the term 'I' signifies
an impression or idea of the self of the sort that Hume failed to discover. Rather, I take it, he is pointing out that the term 'I' functions as a self-reflexive indexical expression which signifies nothing/nobody but the 'performer' - thinker or utterer - of the thought or proposition in which the term 'I' occurs. Thus understood, there is no difficulty in establishing that an existential inconsistency exists whenever the sentence 'I do not exist' is uttered. But then, of course, if the 'I' has a guarantied reference in the dual sense necessary to establish an existential inconsistency, there is no need to appeal to an existential inconsistency to establish the truth of the utterance 'I exist' - it is sufficient simply to point to the semantics of the term 'I'.

However, let us suppose for the moment that Descartes cogito insight turns ultimately on this appreciation of the semantics of the term 'I'. So described, the insight seems incontestable. But what does it amount to? Firstly, on this construction it is clearly possible that the term 'I' may pick out a different referent on each occasion it is uttered. Now, I take it that it is for this reason that Hintikka describes Descartes' first and foremost insight as "a curiously momentary affair". For this, he says is a consequence of the performatoriness of his insight. Since the certainty of my existence results from my thinking of it in a sense not unlike that in which light results from the presence of a source of light, it is natural to assume (rightly or wrongly) that I can really be sure of my own existence only as long as I actively contemplate it.12
This point Descartes quite apparently does not appreciate. For he nowhere suggests that his *cogito* insight is a momentary affair. To the contrary indeed, within the framework of the *Meditations* this insight functions to provide a firm and certain foundation for the sciences - the Archimedean point upon which the edifice of science will be erected!

And this is not the worst of the difficulties which arise if we accept Hintikka's account. For if the *cogito* insight is taken to turn essentially on the logical semantics of the first person pronoun, and given that the first person pronoun is (ex hypothesi) an indexical and self-reflexive expression, then, while the referent of the term may be a thinking thing, it may equally be a robot or a computer or even, for that matter, a recording. For (again ex-hypothesi) the referent of the first person pronoun is simply the utterer of the term 'I', whatever that may be. Thus while the referent of the term must be an 'I' utterer, it is, to put it mildly, not at all clear that it must be, as Descartes subsequently claims, a thing which thinks. Indeed, it becomes quite inexplicable why Descartes should make such a claim. Thus in so brilliantly shoring up one aspect of Descartes' argument, Hintikka subverts the whole.

Hintikka does, however, seem to suggest that we need to think in order to make manifest an existential
inconsistency. This I take is his point when he says:

> It must have seemed to Descartes [that] his ceasing to think would not only mean ceasing to be aware of his own existence; it would put an end to the particular way in which his existence was found to manifest itself.

But here Hintikka seems to be confusing what is made manifest with its recognition. For although the recognition that an existential inconsistency threatens or is manifest, necessarily involves thought, the manifestation of an existential inconsistency does not. To return to our earlier example, if the proposition 'I do not exist' were uttered by a robot or a recording, an existential inconsistency would be manifest, albeit that its manifestation might remain unrecognized. Thus there is clearly a distinction between that, the existence of which is manifest in an existential inconsistency, and that the existence of which is involved in the recognition of an existential inconsistency. It is thus transparently the case that that, the existence of which is manifest through an existential inconsistency, is not necessarily a thinking thing at all. Accordingly, and as Hintikka himself clearly recognizes, it is impossible at this point for Descartes to claim that the existence of which is manifest in an existential inconsistency, is a thinking thing. Thus we appear obliged to reject Descartes' claim that:

> From this I knew I was a substance whose whole essence or nature is simply to think, and which does not require any place, or depend on any material thing, in order to exist. Accordingly this 'I' - that is, the soul by which I am what I am - is entirely distinct from the body, and indeed is easier to know than the body, and would not fail to be whatever it is, even if
While Hintikka attempts to provide some explanation of why Descartes should have committed such a gross error, it is clear that if we accept Hintikka's account of the Cartesian Cogito it is, to say the least, difficult to understand why Cartesian philosophy should have proved of any significant historical importance. For Hintikka's account of Descartes' Archimedean point not only renders it ephemeral, but it fails to provide any foundation for Cartesian dualism. Thus to accept Hintikka's account of the Cogito is to accept that the Cartesian revolution in science and philosophy is unintelligible; a product which just could not intelligibly have been produced by its productive process.

Reduction and Intuition

Now I have no wish to deny that there is some sort of 'performance' involved in Descartes' Cogito Argument. But I want to argue that this cannot be understood simply in terms of the thinking of a thought or the utterance of a sentence to make a statement. Rather it is my contention that the 'performance' here in question must be understood in terms of the sort of movement of the mind that is involved in making an inference. That is, it is a 'performance' of the type involved in bridging an epistemic gap or traversing epistemic distance; it is, as it were, a 'cognitive' performance.
This notion of epistemic distance is one which (not surprisingly) Michael Dummett brings into precise analytical focus in his paper 'The Justification of Deduction'. There he says:

When we contemplate the simplest basic forms of inference, the gap between recognizing the truth of the premises and that of the conclusion seems infinitesimal; but, when we contemplate the wealth and complexity of number theoretic theorems which, by chains of such inferences, can be proved from the apparently simple set of Peano axioms, we are struck by the difficulty of establishing them and the surprises that they yield. We know, of course, that a man may walk from Paris to Rome, and yet that a single pace will not take him appreciably closer: but epistemic distance is more puzzling to us than spatial distance.  

These comments are strongly reminiscent of remarks made by Descartes in Rules For The Direction Of The Mind, Rule Seven. There, he says:

if we have deduced one fact from another immediately, then provided the inference is evident, it already comes under the heading of a true intuition. If on the other hand we infer a proposition from many disconnected propositions, our intellectual capacity is often insufficient to enable us to encompass all of them in a single intuition; in which case we must be content with the level of certainty which the above operation allows. In the same way, our eyes cannot distinguish at one glance all the links in a very long chain; but, if we have seen the connections between each link and its neighbour, this enables us to say that we have seen how the last link is connected with the first. (CSM, 1, 26)

In these passages Dummett and Descartes are each drawing our attention to the peculiar nature of 'epistemic distance', and to the way in which we can travel considerably by means of a series of the apparently
infinitesimal steps involved in inferences or deductions. When we look at a simple inference or deduction, the 'distance' traversed seems infinitesimal and is comprehended by a simple intuition. But when we look at a chain of such inferences, the distance traversed may be considerable and not comprehensible by means of any single intuition. Furthermore, some such chains (not least of which is that presented in Descartes' Meditations) are capable of yielding the most surprising results. So it is that, although apparently infinitesimal, there is nonetheless an epistemic gap to be traversed in effecting even the simplest and most basic forms of inference, and this 'gap' is traversed when we move from recognizing the truth of the premise(s) to realizing a conclusion/proposition whose truth follows from that of the premise(s).

Thus when, in the case of a simple deductive inference, we traverse epistemic distance 'all in a flash', we see 'intuitively' that the truth of the conclusion follows from that of the premise(s). And, it might be remarked, it is a common experience in teaching mathematics that some people can see 'intuitively' or 'all in a flash' the validity of a theorem, which others can recognize only as each step in its proof is individually intuited. And whereas in this latter case, memory is called into play in recognizing the validity of the theorem, in the former, it is not: the validity of the entire proof is seen 'intuitively' or by means of a 'simple act of mental vision'; it is, as it
were, given 'all at once' or 'all in a flash'.

Understanding this, we can understand that an intuition is not something opposed to deductive inference. Rather, in the last analysis it is what makes deductive inference possible: on the one hand, it is that by means of which we are able to move from a recognition of the truth of the premise(s) to a recognition of the truth of the conclusion; on the other hand, it is that by means of which we are able to recognize the validity of a completed simple deductive inference. This important fact is brought out most sharply in the following passage where, speaking of the process of deduction, Descartes says:

It does not seem to take place all at once: inferring one thing from another involves a kind of movement of our mind .... But if we look on deduction as a completed process ... then it no longer signifies a movement but rather the completion of a movement. That is why we are supposing that the deduction is made through intuition when it is simple and transparent, but not when it is complex and involved. (CSM,1,37)

What emerges from this is that, on Descartes' own view, there is a performance - a sort of movement on the part of the mind - involved in any simple deductive inference. To be sure, not a performance in the sense outlined above (a propos of Hintikka's argument), but a performance of the kind which consists in our traversing 'epistemic distance'. And since this kind of performance is described by Descartes as an 'intuition', there is manifestly no tension, modulo Descartes, between describing the Cogito
Argument at one time, and from one perspective, as involving an intuition or simple act of mental vision, and yet at another time, and from another perspective, as involving an inference. The crucial requirement is merely that we read Descartes correctly.

For we can look at deductive inference from two different perspectives. First, there is the first person perspective of the inferring agent whose 'performance' traverses the epistemic distance involved in drawing or realising the conclusion from the premise(s). Or, alternatively, we can take the (third person) perspective of the one who, ipso facto, sees only the outcome(s) of the 'performance' - the completed inference - and so will require an explanatory argument to describe or explain how this 'outcome' was possible. This, I take to be the point Dummett makes when he distinguishes between a 'suasive' and 'explanatory' argument. For a 'suasive' argument, he defines as an argument in which

the epistemic direction must coincide with the consequential one: it is necessary that the premises of the argument be propositions already accepted as true by the person whom we wish to persuade of the truth of the conclusion.\(^{15}\)

But when we wish to explain or justify a 'suasive' argument the conclusion is given in advance, and the epistemic direction runs counter to the direction of logical consequence. This type of argument Dummett\(^ {16}\) describes as an 'explanatory' argument; it involves explaining how the
conclusion was derived from the premise(s). And it is in
giving just such an explanation of the Cogito Argument that
Descartes introduces the notion of an 'intuition' or
'simple act of mental vision'. It is a way of describing
what was 'going on' in the inferential process - what makes
deductive inference possible. And, importantly, in this
context, Descartes' explanation involves no reference to
any conformity of the intellect to mind-independent
extants, or to the cosmic order of things. And thus we see
just how far his argument is from being confused: not only
does Descartes anticipate and foreshadow the sorts of
distinctions drawn upon, seminally, by Frege and Dummett in
their examination of what makes deductive inference
possible, but, no less importantly in this context, he
divorses the necessity associated with deductive inference
from the cosmic order of things (or from what exists
necessarily). Thus Descartes separates himself from his
neo-Platonist predecessors for whom, as we have seen,
logical necessity was construed as derivative from, and
evidence of, necessary being.

Deductive Inference and its Formal Justification

However, it is one thing to show that Descartes is
guilty of no inconsistency in drawing on both the notion of
inference and the notion of intuition in describing and
explaining the Cogito Argument. It is another thing
altogether to show that the inference involved in the
Cogito is logically justifiable. And, a propos of this, it
is important to note Dummett's point that there are three
distinct levels at which a justification of a deductive
inference can be sought and given:

The first level is the unproblematic one: the case in
which an argument can be validated by constructing a
proof, in several steps, from its premises to its
conclusion by use of simpler forms of inference which
are admitted as valid. The second level is ... where
the correctness of a single basic form of inference, or
of a whole systematization of a certain area of
logic, is in question: and it is at this level that a
proof of semantic soundness or completeness at least
purports to provide a justification. But there is a
third, deeper level: that at which we require an
explanation, not of why we should accept a certain
form of argument or canons for judging certain forms
of argument, but of how deductive inference is
possible at all.17

Necessarily, Descartes' explanation of the Cogito Argument
begins at this third and deepest level. In appealing to an
'intuition' or a 'simple act of mental vision' Descartes
is, in effect, providing an explanation of what makes a
deductive inference or a 'suasive' argument possible at
all. And absolutely critically to the concerns of this
study, this explanation does not involve any reference to
necessary being or to the cosmic order of things. It is a
purely 'mind-internal' function which presupposes no
conformity of intellect with, and thus, no direct knowledge
of, mind-independent extants. This move importantly marks
the 'paradigm shift' which separates the Cartesian notion
of the mind and of reason from the classical pre-Cartesian
Christian (neo-Platonist) concept of the intellect and
intellectual perception.
Descartes does not, however, leave the matter here. For he goes on to characterise and explain the inference involved in the Cogito in terms of what he describes as 'principles of our natural light'. These different principles in effect describe the different sorts of 'performances' involved in realising that the truth of a conclusion can be indirectly recognized or intuited: that is, drawn from the truth of the premise(s). Thus there is merit in Curley's reflection that:

... there is a general maxim whose correctness is a necessary condition of the validity of the inference from thought to existence; this maxim is a necessary truth, not merely a contingent one; so it is best regarded, not as a suppressed premise, but as a rule of inference; the argument, therefore, need not take the form of a syllogism and it is artificial to put it in that form since what comes first in the order of discovery is the realization that the inference is valid in the particular case, but later, reflecting on the inference, we recognize that justifying it requires us to justify the maxim.18

Although this passage is somewhat confusing (and becomes more so upon examination), Curley seems to be groping here for a distinction of the sort Dummett draws between a 'suasive' and an explanatory argument. For Curley's claim, as I understand it, is that the Cogito Argument apparently involves, first and foremost, a simple deductive inference from thought to existence, from cogito to sum. But subsequently, when reflecting on the inference, an explanatory argument is required to describe how the inference was possible and how we can realise that the truth of the conclusion follows from that of the premise. And in considering this we are led to identify general
maxims which, by virtue of what they describe, are appropriately termed 'rules of inference'. Thus, modulo Curley, the general maxim involved in the Cogito Argument is essentially a way of describing or explaining the movement on the part of the mind (or the nature of the intuition) which enabled us to move from a recognition of the truth of the premise to that of the conclusion.

Given a gloss of this kind, Curley's position would be unobjectionable. But if this reading of Curley's position were right, it would be not merely artificial, as Curley claims, but quite misleading to claim that the Cogito Argument could take the form of a syllogism, i.e. that the conclusion sum is drawn from two premises, viz: the minor premise cogito and the major premise to the general effect that 'whatever thinks exists'. Furthermore, if the general maxim involved in the Cogito Argument is properly described as a rule of inference, and a rule of inference is essentially a way of describing what we are doing when we make a particular sort of deductive inference, then it would be simply a basic logical error to regard the general maxim involved in the Cogito as the sort of thing which could function as the major premise of a syllogism. For unlike any premise of a syllogism, a rule of inference is a strictly formal principle whose 'correctness' stands quite independent of the truth or falsity of any particular premise. It is, essentially, a procedural explication - a 'protocol account' - of what is 'going on' when by means of a simple intuition, we infer one thing from another. And
it is an interesting fact that we are able to validly infer one thing from another without first explicitly learning what are 'rules of inference'.

However, construed as the major premise of a syllogism, not only would the general maxim involved in the Cogito Argument have to be made explicit prior to the realisation of the conclusion, but its truth would have to be established. And, construed as the major premise of a syllogism, as distinct, that is, from a strictly formal principle whose correctness is given with a recognition of the validity of a particular form of inference, Descartes is certainly not in any position to rely upon it. For he is not in any position to establish its truth. But to thus construe the general maxim involved in the Cogito is not only gratuitous but perverse. For, as Descartes quite clearly recognizes, it is one thing to accept the general maxim involved in the Cogito as a rule of inference, but quite another to accept it as the major premise of a syllogistic argument. This indeed is the point he makes when, in response to the Second Set of Objections, he says:

When someone says 'I am thinking, therefore I am, or I exist', he does not deduce existence from thought by means of a syllogism, but recognizes it as something self-evident by a simple intuition of the mind. This is clear from the fact that if he were deducing it by means of a syllogism, he would have to have had previous knowledge of the major premise 'Everything which thinks is, or exists'; yet in fact he learns it from experiencing in his own case that it is impossible that he should think without existing. (CSM, 2, 100)

Here, Descartes is making it quite clear that the rule of
inference comes first in the order of knowledge. And whereas to cede the correctness of any inferential rule is not to cede the truth of any proposition (which could \textit{ipso facto} function as a premise in a piece of syllogistic reasoning); to cede the validity of any particular deductive inference is to cede the correctness of the particular rule of inference it involves. Here again we need to keep in mind the distinction Dummett draws between a 'suasive' argument (or an argument in which the epistemic and consequential direction are the same), and an explanatory argument (or an argument where the conclusion is already known and the required epistemic direction runs counter to the direction of logical consequence). The former comes first in the order of discovery, the latter is an attempt to explain and account for the former. And we must take care that in providing our explanation we do not distort what we are trying to explain.

Understanding this, it is difficult to understand what Curley has in mind when, after having recognized the validity of the inference involved in the Cogito Argument, he says, "later, reflecting on the inference, we recognize that justifying it requires us to justify the maxim". There is no suggestion that the problem is one which concerns the way in which the general maxim or inferential rule is formulated. But Curley does lead us to the source of his difficulty when, after identifying the general maxim or inferential rule involved in the Cogito Argument as "something like 'Whenever there is an activity we may infer..."
an agent' ... or 'Whenever we perceive any real or positive attribute, we may infer the existence of a subject of that attribute", he immediately concludes: "So no purely formal principle will do"\(^20\).

The only explanation Curley gives for this somewhat startling conclusion 'that no purely formal principle will do' is that "[t]he principle on which the cogito rests is a consequence of the general metaphysical maxim that nothing has no real attributes"\(^21\). Unfortunately, this claim that the general maxim involved in the cogito is a general metaphysical principle rather than a purely formal principle, is not explained. Presumably it is based on the (highly questionable) assumption that purely formal principles are really principles concerning the logical operators 'and', 'not', 'or', etc., whereas metaphysical principles are concerned with the general nature of what is or what exists.

However, this is clearly not Descartes' position. And, pace Curley, we are not forced to confront any exclusive disjunction of logical versus metaphysical principles. For what is in question here, as my introduction of Dummett's important paper indicates, are issues to be decided in the realm of the dispute between competing conceptions of logic (in this case, as regards the nature of deductive inference), and not in any (spurious) dispute between formal logical considerations and those of metaphysics. For, regardless of its content, the domain over which any
principle of logic extends relates to the strictly formal aspects of argument; it does not extend over matters of truth. Thus our entitlement to rely on any strictly formal principle is determined independently of the truth of any proposition.

Thus if, as Curley himself claims, what comes first in the order of discovery is the realization that the inference involved in the cogito is valid, and the general maxim involved in the cogito is best regarded as a rule of inference, then, given that rules of inference are essentially ways of explaining or characterising the sort of movement of the mind involved in a deductive inference, there is surely no reason to suppose that the 'correctness' of the general maxim here in question depends on the truth of a general metaphysical maxim or the general nature of reality. Yet this is precisely what Curley does suppose. He says:

if the cogito argument does depend on a metaphysical doctrine of this sort, the question of Descartes' entitlement to rely on it becomes quite pressing. In the Second Replies Descartes speaks of his metaphysical doctrine as being known by the natural light... But at the beginning of the Second Meditation, where the cogito argument occurs, Descartes is apparently barred from relying on the natural light by his confession, at the end of the First Meditation, that there is nothing he formerly believed to be true which he cannot at that stage doubt, "not merely through want of thought or levity, but for reasons which are valid and well considered."22 I have no quarrel with Curley's claim that the principle involved in the cogito is, on Descartes' view, 'given by
our natural light'. Nor do I dispute the claim that, after the arguments of the first Meditation, Descartes is barred from asserting or relying on the truth of any general metaphysical principle. What I do however dispute is, firstly, the claim that the principle involved in the cogito is derived from or dependent on the truth of any general metaphysical principle and, secondly, that what is given by our natural light are principles whose truth depends on the nature of mind-independent things, as distinct, that is, from strictly formal principles of reason.

*En passant,* it is worthy of note that the relation between logic and metaphysics is a very major issue in contemporary philosophical semantics. And for Dummett (as well as his modal-realist opponents) the principles of 'formal reason' have metaphysical impact, for logic just is metaphysical. And, foreshadowing Dummett, *et al*, the disjunction between formal logic and metaphysics is precisely called into question by the Cogito Argument as Descartes develops it. To be sure, on the Cartesian model the crucial distinction is not explicitly formed as that between metaphysics and formal logic, but as that between mind-dependent and mind-independent objects and our knowledge thereof. But this is but a prior processing of one and the same issue. In failing to realise this, Curley is (understandably) led into ascribing to Descartes problems which, in fact, are generated by a mistaken understanding of the Cartesian position; this
misunderstanding being grounded (at least implicitly) in Curley's adherence to the notion of there being a disjunctive relation between formal logic and metaphysics.

Nonetheless, Curley is quite right in suggesting that, following the skeptical arguments rehearsed in Meditation One, Descartes is not entitled to rely on knowledge of mind-independent extants. This Descartes clearly acknowledges when he distinguishes between two sorts of objects of perception. In the Principles of Philosophy he says: "All the objects of our perception we regard either as things, or affections of things, or else as eternal truths which have no existence outside our thought" (CSM,1,208 - my emphasis). Descartes further claims that it is neither possible nor necessary to list and enumerate all these so-called eternal truths. But he does point out that:

*Nothing comes from nothing* is regarded not as a really existing thing, or even as a mode of a thing, but as an eternal truth which resides in our mind. Such truths are termed common notions or axioms. The following are examples of this class: *It is impossible for the same thing to be and not be at the same time; What is done cannot be undone; He who thinks cannot but exist while he thinks; and countless others. It would not be easy to draw up a list of all of them; but nonetheless we cannot fail to know them when the occasion arises, provided we are not blinded by preconceived opinions. (CSM,1,209)*

Principles of our 'natural light', or what we term 'rules of inference' clearly fall into precisely this category of knowledge (as does the general maxim involved in the Cogito Argument). For in perceiving such rules or principles we
are not perceiving any thing, nor mode of things, existing outside the mind. Rather we are perceiving principles seated in the mind alone. The necessity of what is thus perceived is not derived from or dependent on anything existing outside the mind. Instead, the necessity attaching to the rules of inference or principles given by our natural light is precisely that which governs and makes possible the process of deductive reasoning.

Thus understood, Descartes' 'principles of our natural light', 'eternal truths', 'axioms', 'common notions', etc., are of a kind with Kant's a priori 'givens'. That is: what in Descartes' terminology is 'given by our natural light', or in Kant's terminology is given a priori, is not necessarily so given and does not prescribe or govern what can and cannot possibly exist. However, what is thus given is innate in the mind and determines or governs the ways in which we can think and reason - what we can and cannot perceive as intelligible. Thus it is not unreasonable to describe Descartes' 'principles of our natural light', 'eternal truths', 'axioms' or 'common notions' as precursors of Kant's a priori givens. But where Kant is concerned to describe, enumerate and map out all that is given a priori (i.e. with the nature and structure of the human mind), Descartes contents himself with the discovery that some things are thus given. For his purpose their enumeration is not important. These principles are not, pace Curley, general metaphysical principles at all (in any sense, at least, which would bar Descartes from relying on
them); rather, they are principles of reason seated in the mind alone. Accordingly, our apprehension of them is, as Descartes says, "not normally called 'knowledge' by the dialecticians" (CSM, 2, 100).

What emerges from this is that we may accept Curley's claims: (a) that there is a principle of our natural light involved in the cogito; and (b) that this principle is a necessary truth not merely a contingent one and should be regarded as a rule of inference rather than being (erroneously) regarded as a suppressed premise. But we must reject the suggestion that because (after the arguments of his First Meditation) Descartes is barred from relying on any knowledge of mind-independent things, he is thereby barred from relying on the principle of our natural light involved in the Cogito Argument. For principles of our 'natural light' are given with the nature and structure of the mind; they are not derived from or dependent on any knowledge of things existing outside the mind.

The Skeptical Dialectic and 'Principles of our Natural Light'

We have now seen that Descartes is not barred from relying on the 'principles of our natural light' by the skeptical arguments rehearsed in his First Meditation. This establishes what we might term a 'negative' right to invoke such principles by way of providing a formal justification of deductive inference. But I want now to
argue that Descartes has a positive right to call on and invoke such principles precisely because he is, as it were, engaged in a joust with the skeptics. They are playing the same game and, therefore, must be bound by the same rules.

This point is, of course, evocative of Wittgenstein. And not surprisingly (and despite the important differences in the positions taken up and developed by Descartes and, subsequently, by Wittgenstein) many of the latter's remarks serve as a useful means by which to make this point. For Wittgenstein, when remarking on the principles of logic, very neatly sums up the reasons Descartes might give for not calling into question the principles, axioms, common notions, etc., given by our natural light. He says:

The reason they are not brought into question is not that they 'certainly correspond to the truth' - or something of that sort - no, it is just this that is called 'thinking', 'speaking', 'inferring', 'arguing'. There is not any question at all here of some sort of correspondence between what is said and reality; rather is logic antecedent to any such correspondence; in the same sense, that is, as that in which the establishment of a method of measurement is antecedent to the correctness or incorrectness of any statement of length.23

In a similar way, Descartes' principles, common notion, axioms, etc, given by our natural light are antecedent to the truth or falsity of any scientific knowledge claim. Indeed, these remarks of Wittgenstein are reminiscent of Descartes' comments when, in his Third Meditation, he says:
Whatever is revealed to me by the natural light — for example that from the fact that I am doubting it follows that I exist, and so on — cannot in any way be open to doubt. This is because there cannot be another faculty [power for distinguishing truth from falsehood: French version] both as trustworthy as the natural light and also capable of showing me that such things are not true. (CSM, 2, 27)

In other words, the faculty of our natural light provides, as it were, the instruments of measurement by which we are enabled to distinguish between the true and the false, the valid and the invalid, etc. We accept and cannot doubt the faculty of our natural light for the same reasons we accept and cannot doubt standards or methods of measurement. They make possible the practices predicated on them, and in as much as we go in for such practices, we are compelled to accept the standards, methods, rules or principles which are constitutive of such practices.

The skeptical arguments rehearsed by Descartes in his First Meditation show that, on the standards, methods, rules or principles which are constitutive of the game of reasoning, the entire edifice of pre-Cartesian science must be rejected as dubitable. These skeptical arguments present the philosophical dogmatist with a dilemma. For the dogmatist can either accept that scientific knowledge claims must thus be held as dubitable and unreliable or, alternatively, deny that any significance attaches to the fact that on the standards constitutive of the game of reasoning, scientific knowledge is dubitable. To take this latter view clearly involves a rejection of reason as the final arbiter or ground of certainty. And, of course, such
was precisely the approach commonly taken in pre-Cartesian Christian Europe. For the certainty of scientific knowledge was understood as ultimately secured, not by reason, but by faith: hence the 'arbitrary' power of the Church. Clearly this approach involves a denial, not only of the supremacy of reason, but of the destructive force of skeptical argument.

Far from taking this approach, Descartes accepts the destructive force of skeptical argument and insists that reason, rather than faith, is the ultimate ground both of certainty and of doubt (at least, with regard to scientific knowledge). And insofar as Descartes is able to establish that reason can provide a firm and certain foundation for science, he can properly be described as taking on, and bearing, the skeptics at their own game. Of course, the skeptic can refuse to continue to play this game and, indeed, may invent new ones. But Descartes' right to rely on the principles of reason cannot be denied without, at the same time, denying the destructive force of the skeptical arguments rehearsed in Meditation One. Thus, by explicitly admitting the destructive force of the arguments of the skeptics in Meditation One, Descartes is thereby establishing his positive right to rely on the standards, methods, rules, etc., constitutive of the game of reasoning. Should the skeptics refuse to accept the rules constitutive of this game, this merely means that the skeptics have changed their game.
Thus, whether the rules or principles of reason are given by our natural light or given a priori, as Descartes and Kant would claim, or whether they are products of some sort of ‘form of life’ as Wittgenstein and perhaps Hegel also might claim, the central point remains; namely, that by choosing to engage in any game or practice (e.g. reasoning) we thereby place ourselves in a position where we must allow the rules or principles constitutive of that game or practice to compel us. It is impossible to bring into question the rules or principles of the game whilst continuing to play the game. By the same token, if we refuse to accept the rules of the game and to allow them to compel us, we cannot be playing the game constituted and made possible by the rules. And this applies equally to both the skeptic and the philosophical dogmatist.

And it is an interesting fact that we can join in this game, and even act as umpires, without having read or enumerated the rules of the game in which Descartes is engaged. But when the occasion presents itself – when, for example, the legality of a move is questioned – the rules of the game are brought into sharp focus. Characteristically, this happens when someone makes an apparently significant but unfamiliar move, or invests a familiar move with a previously unsuspected significance. The Cogito Argument belongs to the latter of these categories.
Chapter Five: Footnotes

1 Williams, B, 'The Certainty of the Cogito', in Doney W (ed), Descartes, 89

2 Curley E, Descartes Against The Skeptics, p72

3 Cottingham J, Stoothoff R and Murdoch D, The Philosophical Writings of Descartes, Vol2, p100

4 ibid

5 Ayer A J, 'I think, Therefore I Am', in Doney W (ed), op cit, p81

6 Curley E, op cit, Chapter 4

7 Ayre F J, op cit

8 Hintikka J, 'Cogito Ergo Sum: Inference or Performance?', in Doney W (ed), op cit, p116

9 ibid, 121

10 ibid, p122

11 ibid, p126

12 ibid, p127-8

13 ibid, p129

14 Dummett, 'The Justification of Deduction' in Truth and Other Enigmas

15 Dummett, op cit, 296

16 ibid

17 ibid, 297

18 Curley, op cit, p91
19 ibid
20 ibid, p92
21 ibid, p92-3
22 ibid, p93
Chapter Six

THE COGITO AND THE FIRST PERSON PROPOSITION

Mind/Body Dualism and the Usefulness of Deduction

In one sense, it is true to say that there is nothing new or startling about Descartes' so-called Cogito Argument. For as is often pointed out, the argument was a familiar one to Descartes' predecessors and contemporaries. Arnauld, for example, begins his Objections by noting that:

our distinguished author has laid down as the basis for his entire philosophy exactly the same principle as that laid down by St Augustine.... In Book II chapter 3 of De Libero Arbitrio, Alipius, when he is disputing with Euodius and is about to prove the existence of God, says the following: 'First, if we are to take as our starting point what is most evident, I ask you to tell me whether you yourself exist. Or are you perhaps afraid of making a mistake in your answer, given that, if you did not exist, it would be quite impossible for you to make a mistake? This is like what M. Descartes says: 'But there is a deceiver of supreme power and cunning who is deliberately and constantly deceiving me. In that case too, I undoubtedly exist if he is deceiving me'. (CSM, 2, 139)

But if there is nothing new about the Cogito Argument itself, there is something new and startling about what Descartes draws from it. This Arnauld makes clear as he continues:

But let us go on from here and, more to the point, see how this principle can be used to derive the result that our mind is separate from our body. (CSM, 2, 139)
From this, it is apparent that while Arnauld is not concerned about the validity of the Cogito Argument, he is concerned about its purported usefulness or what it supposedly shows. For Descartes draws something from the argument that was certainly not suspected by Augustine, viz, "I am, then, in the strict sense, only a thing that thinks" (CSM, 2, 18). The problem for us here is that of how, and why, the Cogito Argument should be supposed to be capable of securing this startling claim.

This problem is one which once again brings into sharp focus the perplexing nature of deductive inference. And, in the following I will show that, through an unravelling of the inferential process involved in the Cartesian Cogito, the ground for the claim that 'thought alone is inseparable from me' is revealed. That is to say, the question of how Descartes grounds the real distinction between mind and body is not unrelated to the question of whether the Cogito involves a deductive inference. Indeed, we have already seen that if, as Hintikka argues, we take the contrary 'non-deductive' view and hold that Descartes could have begun just as well with the certainty of his own existence as with the certainty of his own thought, he has no ground for subsequently claiming that 'I am, then, only a thing which thinks'. However, we have yet to see that, and how, the claim that 'thought alone is inseparable from me' is secured by the deductive process involved in the Cogito Argument. And unless this can be shown, not only is the question of whether we should take an 'inferential' or
'non-inferential' view of the Cogito reduced to one of little consequence but, worse, we must we grant that the Cogito Argument is singularly pointless and useless. For, as A.J. Ayer acutely points out, statements like 'I exist' may be self-verifying but "they have nothing to say beyond what is implied in the fact that they have a reference". However, I will argue, just because the certainty of this proposition is deduced from that of the premise 'I think', we are able to draw out the essential nature of the referent of the first person pronoun.

We have already seen that Descartes provides a justification of his Cogito Argument by invoking an explanation centered on the nature and status of rules of inference. This explanation was quite exceptional for its time in that, by way of accounting for the legitimacy or validity of the argument, it invokes the same sort of considerations which were subsequently to lead to the development of the Kantian a priori categories. However, this explanation does not enable us to understand how, or in what way, the claim that the mind is separate from the body is secured: it does not explain the particular respect in which the deductive inference involved in the Cogito is productive of the startling discovery that 'thought alone is inseparable from me'.

Of course, this problem of explaining how a deductive inference can be useful - how it can yield startling discoveries - is not one unique to the Cartesian Cogito.
To the contrary: the problem here before us is but a particular instance of a more general problem concerning the perplexing nature of deductive inference: viz., that of accounting for its usefulness - for the startling discoveries it enables us to make - without sacrificing what is required to account for its legitimacy. Indeed, this difficulty is one Michael Dummett brings into focus when he says:

The existence of a deductive inference is problematic because of the tension between what seems necessary to account for its legitimacy and what seems necessary to account for its usefulness. For it to be legitimate, the process of recognizing the premises as true must already have accomplished whatever is needed for a recognition of the truth of the conclusion; for it to be useful, a recognition of its truth need not actually have been accorded to the conclusions when it was accorded to the premisses. Of course, no definite contradiction stands in the way of satisfying these two requirements: recognizing the premises as true involves the possibility of recognizing the conclusion as true, a possibility which will not in all cases be actualised.2

To say that 'no definite contradiction stands in the way' of accounting both for the legitimacy and usefulness of a deductive inference indicates that, although not impossible, the task before us is a difficult one. And in the case of the Cogito, where the conclusion is drawn from but a single premise it is most assuredly, as Dummett puts it "a delicate matter to so describe the connection between premisses and conclusion so as to display clearly the way in which both requirements are fulfilled". Indeed, so delicate is the matter, that it is apt to seem that the argument cannot be both legitimate and useful. And if
this difficulty cannot be resolved it can, at least, be
avoided by denying that the Cogito involves a deductive
inference at all. It is in just this manner that the
debate surrounding Descartes' Cogito Argument has
proceeded.

A major problem in accounting for the usefulness of the
inference involved in the Cogito is that, in discussing the
nature of deductive inference, philosophers have, generally
speaking, tended to stress the requirements necessary to
establish legitimacy. And, says Dummett, by focussing on
such dicta as "that the premisses contain the conclusion,
that inference yields no new knowledge, that logic holds no
surprises, and the like ..."3 the brevity of the gap
between recognizing the truth of the premise(s) and
conclusion of an argument is emphasised to the point that
it becomes difficult to see how any deductive inference -
and particularly one which moves from but a single premise -
could be of any cognitive significance at all. Indeed,
so influential is this emphasis on the legitimacy of
deduction, that we are often apt (unreflectively) to take
startling results as indicative of an argument's
possible/probable invalidity. Thus, there appears
something bold - perhaps even vaguely heretical - in my
claim that the usefulness of the Cartesian Cogito lies in
its providing the ground for, and securing Descartes'
mind/body dualism. Nonetheless, such is my claim.

However, against this emphasis on what seems necessary
to account for its legitimacy, Frege, in his famous paper *On Sense and Reference*, emphasised that our interest in deductive argument lies in the problem of how it can be informative: how we can learn something from it as regards the objects inferred from the premise(s); how it can have cognitive/epistemic content. Thus Frege brings into focus the *fruitfulness* of deductive inference by insisting that "the conclusion is contained in the premisses as plants are contained in their seeds, not as beams are contained in a house". Thus understood, the usefulness/fruitfulness of a deductive inference does not depend on there being a plurality of premises from which the conclusion is drawn. For in drawing a conclusion we need not be, as it were, simply re-arranging or putting together bits of information already presented in fragmented form in two or more premises (as is the case, for example, in syllogistic reasoning). This being so, there is good reason to argue that a deductive inference can be 'fruitful' or 'useful' even where the conclusion may be drawn from but a single premise. For one premise is demonstrably sufficient in this respect if it can be shown, *modulo* Frege, that it contains the conclusion 'as plants are contained in their seeds, not as beams are contained in a house'.

But this sets us no minor task here. Frege's metaphor is certainly a powerful one, but the demand it places on us is to show, and without final resort to metaphor, precisely how the recognition that 'I am then only a thing which thinks' is drawn, as a plant from a seed, from the premise
'I think'. Just how we might go about tackling this problem is suggested by Dummett when he says: Presumably the meaning that we assign to a statement (i.e. to the expressions of which it is composed) determines by what means the statement can be recognized as true. In some cases, the meaning of the statement may be such that an inferential process is necessarily involved in the recognition of it as true.\textsuperscript{5}

Dummett's thought here seems to be that, at least in some cases, an inferential process is necessarily involved in the recognition of a statement as true. This, in its turn, suggests that there may be a sense in which we cannot fully apprehend the meaning of certain statements (or the expressions of which they are comprised) unless we are capable of deductive inference. While a pursuit of this general point falls outside the ambit of this study, Dummett is, I think, on the right track here. For he is surely correct in focusing on the question of meaning by way of explaining how we might understand Frege's claim that the conclusion of a deductive inference is contained in the premises, 'not as beams in a house, but as a plant in a seed'.

\textbf{Deduction and The Meaning of the First Person Pronoun}

In what follows, I want to explain the usefulness of the Cartesian Cogito by showing that the process of recognizing the premise as indubitable, creates the possibility not only of recognizing the conclusion as indubitable, but of
coming to grasp more fully and to understand the logic and meaning of the expressions of which it is comprised. Thus, I will argue, we can see that the process of recognizing the premise 'I think' as indubitable, creates the conditions which enable the semantics of the first person pronoun to be progressively revealed or drawn out. And it is in this 'drawing out' of the semantics of the first person pronoun that the usefulness of the Cartesian Cogito consists.

Here, however, we must be careful. My claim is not that the usefulness of the Cogito Argument depends on its power to induce us to engage in some kind of 'semantic revisionism' (by contrast, therefore, with the intent behind Dummett's anti-realist concern with the nature of deduction). For this would be to emphasise its usefulness in a manner which would inevitably call into question, and bring down controversy upon, its legitimacy. It is therefore rather my point (quite conservatively) that what is in question here is a development in meaning similar to that which occurs when, in everyday life, we move from, say, an understanding that a triangle is a three sided figure to an understanding that its angles are equal to 180 degrees. And just as, on this precisely 'mundane' interpretation, there is no question of changing the use or meaning of the term 'triangle', neither is there any question of changing the use or meaning of the first person pronoun. It thus demands no semantic revisionism to explicate the Cogito argument by explicating the semantics
of the first person pronoun on the model of 'a plant's
drawing out and showing forth what is contained in a seed'.

Central to this explication of the Cogito is the claim,
pace Hintikka, that the logic and meaning of the first
person pronoun is not necessarily fully recognized either
prior to, or with the recognition that the premise 'I
think' is indubitable. That is, its correct use does not
presuppose a full and explicit understanding of its
semantics. And this in just the same way, to return to our
earlier example, that we can correctly understand and use
the term 'triangle' without first having recognized the
truth of, say, the proposition that 'the angles of a
triangle are equal to 180 degrees'.

The Semantics of The First Person Pronoun

In order to grasp the usefulness of Descartes' Cogito
Argument, we must start with a consideration of what
knowledge of the general semantics of the first person
pronoun is both necessary and sufficient for its correct
use. Here, it quickly becomes apparent that there is
something very odd about the first person pronoun. For
firstly, and contrary to the view suggested by elementary
grammars, it does not seem that 'I' can be understood as a
pronoun which, under certain circumstances, we use in the
place of a name or proper noun - that is, as the word Mary
uses to pick out the referent of the name 'Mary'. For as
Elizabeth Anscombe has pointed out in her interesting
article 'The First Person', we do not need to know who or what is the referent of any name or proper noun in order to correctly use the term 'I'. Thus a person with amnesia may forget who they are (that is, what their name is) and yet retain the correct use of the first person pronoun.

This consideration has led to the view that the first person pronoun is to be understood simply as an expression which somebody uses to refer to themselves. However, here we need to be conscious of the meaning of the words we use. For on this construction it is clear that the term 'I' must, on each occasion of its use, pick out or refer to some body. But if this is so it would follow, strictly as a matter of grammar, that a ghost could not make correct use of the first person pronoun. This is clearly absurd and, accordingly we must reject the claim that, in order to make correct use of the first person pronoun we must be some body.

It seems then, that the only requirement for the correct use of the first person pronoun is an understanding that it is a self-reflexive expression. That is, the referent of the term is identical with the user of the term - whatever that may be. This then, is our starting point. We do not have to know what sort of thing is 'picked out' by the term in order to use it correctly. However, just what sort of thing is 'picked out' by the first person pronoun is precisely what is drawn out in Descartes' Cogito Argument.
In the following I want to argue that the process involved in recognizing the premise 'I think' as indubitable is crucial to a recognition of the usefulness of the argument - to a 'drawing out' of the semantics of the first person pronoun. For, as we will see, this process creates the condition which makes it possible for us to recognize not merely that I am, but what it is that I am; that is to say, what belongs to the essential nature of the referent of the first person pronoun.

To this end, it is here of crucial importance that we reflect on the significance of the fact that, although the proposition 'I think' is indubitable, the same does not hold true of other propositions of similar form which relate to the body - such as, for example, 'I walk'. And, modulo Descartes, we must recognize what this fact tells or shows us about the nature of the referent of the first person pronoun. What knowledge about the essential nature or identity of the 'I' user is to be gleaned from this fact?

To answer this question it is important to look to how the process of recognizing the truth of the proposition 'I think' differs from the sort of process involved in recognizing the truth of either the proposition 'I walk' or even 'There are thoughts'. For it is cause for remark that when considering the truth of the proposition 'I think', the question of whether we have sufficient evidence for its truth, is not one which can coherently arise. Such a
question is, as A.J.Ayer points out, indeed hard to answer, but mainly because it seems improper in these cases to speak of evidence at all. If someone were to ask me How do you know that you are conscious? .... I should not know how to answer him; I should not know what sort of answer was expected. The question would appear to be a joke, a parody of philosophical cautiousness. If it were seriously pressed, I might become indignant ...

In other words, it makes no sense to speak of evidence sufficient to assert the truth of the proposition 'I think', and in this respect the statement 'I think' is significantly different to 'I walk', or even 'There are thoughts'. Arguably, this is because the question of what evidence we could have for the truth of the proposition 'I think' makes no sense because it presupposes the possibility that we could mistake the appearance of thought for its reality. But, and here is the point, just in taking up the first person perspective, we take up a perspective according to which there is no coherent possibility of mistaking the appearance for the reality. That is to say, our knowledge or awareness of thought is direct; it is unmediated by appearances which, on pain of absurdity or insanity, may be mistaken for the reality. Thus our apprehension of thought is certain (and coherent) knowledge. But this sort of certainty, it seems, is possible in the case of thought and thought alone.

Let us review the position at which we have now arrived. In the case of thought, and thought alone, there is, from
the first person perspective, no distinction or gap between the appearance and the reality, between what seems and what is; thought is, as is often remarked, transparent to itself. Consequently it is simply incoherent to imply or suggest (by, for example, asking what evidence we have for the truth of the proposition 'I think') that there is the possibility of mistaking the appearance for the reality. Ayer's indignation when pressed to provide evidence in answer to the question 'How do you know you are conscious?' is entirely justified and directed against what is implicitly presupposed by the question: the thought that there is a coherent distinction between the appearance and the reality of thought such that we could sensibly mistake the one for the other. Yet, of course, it is only from the first person perspective that there is no coherent distinction between the appearance and reality of thought. From the third person perspective we can mistake the appearance for the reality. When we speak of, for example, extra-terrestrial intelligence we not only thereby take up a third person perspective on thought, but in so doing we (at least implicitly) recognize and allow for the possibility that we may coherently mistake what seems or appears to us for what really is. Thus we may say that it is only for the referent of the first person pronoun that thought is transparent. Thus, modulo Descartes, we are led to conclude that the referent of the first person pronoun is a mind.

Another way of putting the same - crucially dualistic -
point, would be as follows. As thought is transparent to itself (but not to what is other than itself) and as it is transparent to the referent of the first person pronoun (that is, it makes no sense to suggest that the 'I' user could mistake its appearance for its reality), then with Descartes we are led to conclude that the thing to which thought is transparent is identical with, or at least, not separable from, the referent of the first person pronoun. And since we call a thing to which thought is transparent a 'mind' or 'intellect', we can, modulo Descartes, rightly claim that the referent of the first person pronoun is a mind or intellect. Thus it is central to this exegetical analysis of the Cogito that the claim that 'I am strictly speaking only thing which thinks' is not to be understood simply as meaning that thought can, as a matter of contingent fact, truly be predicated of the referent of the first person pronoun. Rather, it is to be understood as meaning that the referent of the first person pronoun is a thing to which thought is transparent. The 'thing' in question is, and can only be, a mind, or intelligence, or intellect or reason.

It is important to see that this line of argument involves two principal claims. Firstly, it is my contention that the impossibility of situating ourselves such that we could coherently mistake the appearance of a thing for its reality is, of itself, sufficient to indicate that our perspective on that thing is that of the first person and thus, that the 'thing' is identical with (or at
least not separable from) the referent of the first person pronoun. And given this claim, then, since it is only in the case of thought that we cannot mistake the appearance for the reality, we can with Descartes conclude that thought alone is inseparable from, and therefore belongs to the essential nature of, the referent of the first person pronoun. Accordingly, there is a real distinction between mind and body: viz, the latter but not the former is separable from the 'I' user.

The issues raised in these claims are, of course, logical. They relate to the semantics of the first person pronoun. And prima facie, the point on which the argument turns is the contention that, insofar as we stand in a position which admits any possibility such that we could coherently mistake the appearance of a thing for its reality, then we cannot be considered identical with, or inseparable from, that thing but may be related to it as a third person observer. But where it makes no sense to suggest that we could mistake the appearance of a thing for its reality, then, logically speaking, we cannot be separate from that thing and thus our knowledge of the nature of that thing is knowledge of ourselves, or, what is the same thing, knowledge which enables us to recognize the semantics of the first person pronoun. Thus Cartesian dualism is grounded in the logical semantics of the first person pronoun.

The model I have developed here shows that, and why, it
is important to recognize Descartes Cogito Argument as involving a deductive inference which begins with the process involved in the recognition of the truth or certainty of the premise 'I think'. For it is now clear why Descartes must, as he does, strenuously object to any suggestion that he might just as well have inferred 'I exist' from, say, 'I walk' or any other of his actions. For, as he says:

When you say that I 'could have made the same inference from any one of my other actions', you are far from the truth, since I am not wholly certain of any of my actions, with the sole exception of thought (in using the word 'certain', I am referring to metaphysical certainty, which is the sole issue at this point). I may not, for example, make the inference 'I am walking, therefore I exist', except in so far as awareness of walking is a thought. The inference is certain only if applied to this awareness, and not to the movement of the body which sometimes - in the case of dreams - is not occurring at all, despite the fact that I seem to myself to be walking. Hence from the fact that I think I am walking I can very well infer the existence of a mind which has this thought, but not the existence of a body that walks. And the same applies in other cases. (CSM, 2, 244)

Here, Descartes is making it quite explicit that what is inferred from the premise 'I think' is the existence of a mind. That is to say, the referent of the first person pronoun can be recognized, not merely as the user of the term but, far more strongly, as a mind, or 'a thing to which thought is transparent'. And, although the nature or identity of the referent of the first person pronoun may not have been known prior to the process involved in the recognition of the indubitable nature of the premise 'I think', in drawing the conclusion 'I exist' Descartes is,
at least on his own cognizance, inferring the existence of a mind or intellect. Consequently, the nature of the referent of the first person pronoun (or the semantics of the first person pronoun), is, so to speak, drawn out (with the conclusion 'I exist') from what is involved in the process of recognizing the indubitability of the premise 'I think'.

Moreover, because the process involved in the recognition of the truth of, say, the proposition 'I walk' differs from that involved in the recognition of the indubitable nature of the premise 'I think', then, even if the proposition 'I walk' perchance were true, we could not from that fact infer that bodily existence is inseparable from the referent of the first person pronoun. For the fact that, in the case of this proposition, the user of the first person pronoun could coherently mistake the appearance for the reality of walking is, of itself, sufficient to indicate that the thing which walks is separable from the referent of the first person pronoun and does not therefore belong to the essential nature of the referent of 'I'.

Here we can see that there is some basis for the claim that skepticism with regard to the existence of body plays some role, (as most commentators suggest it must), in Descartes' coming to realise that the mind is separable from the body, without, at the same time, attributing to Descartes the so-called infamous argument from doubt. That
is to say, on the construction developed here, Descartes is not, as Norman Malcolm charges, arguing from the premise that he could doubt the existence of his body but could not doubt his own existence, to the conclusion either that he was not his body, or that there was no essential connection between him and his body.7

For what is crucial to Descartes' mind/body dualism is the logical point that, from the first person perspective, the distinction between appearance and reality collapses in the case of thought and thought alone. Thus, even if we were to suppose that the proposition 'I walk' were true, (that it, that we have not mistaken its appearance for its reality) we could not draw from this any knowledge of what necessarily belongs to the referent of the first person pronoun. For although body may be transparent to itself, it is not transparent to us - there is always a coherent possibility that we may mistake its appearance for its reality. From this it follows that, although the referent of the first person pronoun cannot be separable from a thing to which thought is transparent - mind, intelligence or consciousness, it is related to body as a third person observer. It is therefore logically separable from body. On this account, and pace Ayer, the method of determining what the referent of 'I' is - its nature or essence - stands independent of the recognition that anything exists. Indeed this, as we shall see, is a point brought out in Descartes 'piece of wax' passage.
Moreover, it is now apparent that Descartes' use of the first person perspective - his 'meditative' mode of writing - is not a mere rhetorical or literary device indicative of the essentially personal nature of his project. For Descartes' mind/body dualism turns, in the final analysis, on a semantic analysis of the first person pronoun. And, if this semantic analysis is correct, it follows that we must reject the view that, like the demonstratives 'this' and 'that', the term 'I' functions as an indexical expression which is, as it were, entirely indifferent to the nature of the object it may be used to pick out. For if there is something which belongs to the essential nature of the referent of the first person pronoun, then clearly the first person pronoun cannot be used, like the demonstratives 'this' or 'that', to pick out any object at all (regardless of its nature).

Semantics: A Matter of Intellect or Imagination?

With the claim that 'thought alone is inseparable from me' Descartes makes it clear that thought alone belongs to the essence of the referent of the first person pronoun. That is to say, a complete idea of what the referent of the first person pronoun is, must include the idea of a thing which thinks - a mind or intellect. But this is all it must include. And yet, the temptation to imagine that the referent of the first person pronoun is a body remains strong. And it is certainly true that from the perspective of the third person observer, the referent of the first
person pronoun appears to be a body. Thus, as Descartes suggests, we are apt to imagine that the referent of the first person pronoun is a body. But, he insists, it requires but little reflection to recognize that our imagination cannot provide any basis for the claim that body is inseparable from, and belongs to, the essential nature of the referent of the first person pronoun. For what is here in question is a semantic analysis of the first person pronoun as distinct, that is, from an attribution of meaning based on sense perception or imagination. Once this point is grasped then, as Descartes says,

> to say 'I will use my imagination to get to know more distinctly what I am' would seem as silly as saying 'I am now awake, and see some truth; but since my vision is not yet clear enough, I will deliberately fall asleep so that my dreams may provide a truer and clearer representation.' (CSM, 2, 19)

Putting a modern gloss on the same thought, we might say modulo Descartes, that it is absurd to suggest that we can, by means of the imagination or the senses, come to understand or draw out the semantics of the first person pronoun.

Yet, of course, a gloss of this kind was not available to Descartes. For although Descartes is doing semantics, it was not until some three centuries later that Tarski was to make explicit what one is doing when one is doing semantics. And without the benefit of the work of Tarski (and others) Descartes is unable to do more than explain
his position by way of illustration. Thus, despite his 
flat dismissal of 'knowledge' by imagination, he returns 
again to this crucially important theme. He says:

But it still appears -- and I cannot help thinking 
this -- that the corporeal things of which images are 
formed in my thought, and which the senses 
investigate, are known with much more distinctness 
than this puzzling 'I' which cannot be pictured in the 
imagination. (CSM, 2, 20)

A Piece of Wax: A Semantic Analysis

Taking a new approach to the problem of explaining his 
insight into semantic analysis, Descartes gives full rein 
to the notion that our knowledge of what anything is 
depends on perceptions of the imagination or of sense. 
Thus he launches into his celebrated 'piece of wax' 
passage. He says:

Let us consider the things which people commonly think 
they understand most distinctly of all; that is, the 
odies which we touch and see. I do not means bodies 
in general - for general perceptions are apt to be 
slowly more confused - but one particular body. Let us take, for example, this piece of wax. (CSM, 2, 20)

The question which informs this discussion is one 
concerning the logic and meaning of expressions we use. 
And, prima facie, it seems that the attribution of meaning 
involves, or more strongly, depends on, perceptions of 
sense and imagination. Thus Descartes says:

Let us take, for example, this piece of wax. It has 
just been taken from the honeycomb; it has not yet 
quite lost the taste of honey; it retains some of the 
scent of the flowers from which it was gathered; its 
colour, shape and size are plain to see; it is hard, 
cold and can be handled without difficulty; if you rap 
it with your knuckles it makes a sound. In short, it
has everything which appears necessary to enable a body to be known as distinctly as possible. (CSM, 2, 20)

That is to say, it appears that all that is necessary for an understanding of the meaning of the expression 'a piece of wax' is given by means of sense perception. But, Descartes argues, this cannot be so. For although all of its sensible properties/qualities may change, we can yet judge that the same piece of wax remains. He says:

But even as I speak, I put the wax by the fire, and look: the residual taste is eliminated, the smell goes away, the colour changes, the shape is lost, the size increases; it becomes liquid and hot; you can hardly touch it, and if you strike it, it no longer makes a sound. But does the same wax remain? It must be admitted that it does; no one denies it, no one thinks otherwise. (CSM, 2, 20)

If the attribution of meaning to the expression 'a piece of wax' depended only on perceptions of sense we clearly could not judge that the same piece of wax remains despite a change in all its sensible properties/qualities. The judgement would be absurd. The attribution of meaning to an expression (even one relating to body) cannot therefore be dependent entirely on sense perception. Thus, abstracting all that is separable from the logic and meaning of 'a piece of wax' Descartes says, "Let us concentrate, take away everything that does not belong to the wax, and see what is left: merely something which is extended, flexible and changeable" (CSM, 2, 20). The notions of 'extended', 'flexible' and 'changeable' are not, as Descartes points out, to be found in perceptions of the imagination. Thus he concludes, "I must therefore admit
that the nature of this piece of wax is in no way revealed by my imagination, but is perceived by the mind alone" (CSM, 2, 21). In short, meaning is a matter of semantics, and semantics is a matter, not of sense or imagination, but of logic.

We can now see precisely what the celebrated 'piece of wax' passage is supposed to be doing in Descartes' Second Meditation. For, putting aside the existential import of the Cogito Argument, the argument of the 'piece of wax' passage exactly parallels that of the Cogito. For each involves a drawing out of, by means of intellectual perception, the logical semantics of an expression. And just as the wax which we perceive as having the taste of honey, the scent of flowers, etc., is the same as that perceived by means of the intellect, so similarly, there is no semantic revisionism involved in claiming that thought alone belongs to, and is inseparable from, the referent of the first person pronoun. And this is so despite the fact that we may previously have imagined that the referent of the first person pronoun is a body.

We can now recognize the argument of Meditation Two as a single coherent whole with the question 'What, then, am I?' serving primarily to bring into focus, and to highlight the 'usefulness' of the Cogito Argument: viz., what it reveals to us of the logic and meaning of the first person pronoun. The so-called 'piece of wax' passage functions to illustrate the nature of, need for, and importance of,
semantic analysis. But because this notion had no place in the universe of philosophical discourse available to Descartes, his insight is one which must struggle for expression. Yet with the benefit of hindsight, we are in a position now to clearly understand what makes Descartes' mind body/dualism such a persuasive doctrine, despite the oft repeated charge that his explicit proofs of it are unsatisfactory.

**Arnauld and the Nature of Semantic Analysis**

Furthermore, we can now clearly see that what is at issue in the interchange between Descartes and Arnauld on this matter, is a question relating to the nature of semantic analysis. For although Arnauld accepts Descartes' insistence that the nature of the referent of the first person pronoun can only be determined by means of intellectual perception, he claims that the only thing which follows from Descartes' argument is "that I can obtain some knowledge of myself without knowledge of the body". And, unable to draw benefit from Tarski's insight into logical semantics, he complains:

> But it is not yet transparently clear to me that this knowledge is complete and adequate, so as to enable me to be certain that I am not mistaken in excluding body from my essence. I shall explain the point by means of an example. (CSM,2,141)

Arnauld's choice of example is apt. For after suggesting that body may be related to mind as genus is to species, he suggests that Descartes' argument that body is distinct and...
separable from mind parallels the following fallacious argument:

I clearly and distinctly perceive ... that the triangle is right-angled; but I doubt that the square on the hypotenuse is equal to the squares on the other two sides; therefore it does not belong to the essence of the triangle that the square on its hypotenuse is equal to the squares on the other sides. (CSM,2,142)

Descartes' response to this objection is to deny, unequivocally, that the same sort of logical connection holds between mind and body as holds between a right-angled triangle and the ratio of the square of its hypotenuse with the square of its other two sides. He says:

Although we can clearly and distinctly understand that a triangle in a semi-circle is right-angled without being aware that the square on the hypotenuse is equal to the squares on the other two sides, we cannot have a clear understanding of a triangle having the square on its hypotenuse equal to the squares on the other sides without at the same time being aware that it is right-angled. And yet we can clearly and distinctly perceive the body without the mind and the mind without the body. (CSM,2,158)

That is to say, although we can infer from the idea of a right angled triangle that the square of its hypotenuse is equal to the square of its other two sides, the idea of mind cannot be inferred from that of body, or vice versa. Thus, mutatis mutandis, logical semantics provides the ground for mind body/dualism. And given this semantic analysis, it is apparent that body cannot be related to mind as genus to species. For, as Descartes says, "although a genus can be understood without this or that specific differentia, there is no way in which a species can be thought of without its genus" (CSM,2,157). And, we
might add, any claim to the contrary would involve semantic revisionism on an impressive scale.

It is worth noting here that, like Arnauld, Descartes is working with the following notion of 'essence'. The view is that what belongs to the essence of a thing is inseparable from it in the sense that it is necessarily involved in our idea of that thing. And this in the same way as our idea of a triangle necessarily involves the idea of a figure whose angles are equal to 180 degrees. Further, because on this view, logical or necessary relationships can be perceived only by the intellect, the perception of what is involved in the essence of a thing involves no perceptions of sense or of imagination. It involves only perceptions of the intellect. But for Descartes, unlike Arnauld, necessity is a matter of logical semantics; it is not a derivative of metaphysics or ontology.

From this it is clear that to claim that body is not involved in the essential nature of the referent of the first person pronoun is not to say that body may not be contingently related to the referent of the first person pronoun. And, indeed, after having established the existence of a veracious God, Descartes makes just such a claim. But this in no way detracts from Descartes' argument that the referent of the first person pronoun is a thing to which thought is transparent - a mind, intelligence, intellect or reason - and that this mind is
distinct and separable from body.

Reflections

The argument of Descartes' Second Meditation thus marks the genesis of a radically new concept of the mind. For on the Cartesian model, the nature of the mind - i.e. its essence - can be known and understood without reference to anything other thing. It is a self-defining subject. In this respect the Cartesian mind stands in sharp contrast with the concept of the intellect embedded in pre-Cartesian philosophy. For on this earlier model, it was accepted that it belongs to the essence of the intellect to become in some way conformed with the being of external objects. Thus, the nature of the intellect was understood through its objects. Accordingly, the debate relating to the nature or essence of the intellect focused primarily on questions relating to such matters as the proper (or natural) and adequate object of the intellect.

Within this context, Descartes' claim to have demonstrated the existence and defined the essence of the mind without reference to any other thing has massive revolutionary impact. For the emergence of the Cartesian concept of the mind gave rise, inter alia, to the problem of the external world, and engendered a new approach to our understanding of reason, necessity, meaning and truth. Descartes was clearly not unaware of this. And, although it remained to Kant, Tarski and others to explicitly draw
out, and give expression to, the changes required in our understanding of these notions, it is apparent that the emergence of the Cartesian concept of the mind significantly transformed the philosophical agenda.
Chapter Six: Footnotes

1 Ayer A J, 'I Think, Therefore I Am', in Doney W (ed), Descartes, p87
2 Dummett M, 'The Justification of Deduction', in Truth and Other Enigmas, p297
3 ibid, p300
4 Frege, 'Grundlagen der Arithmetik', quoted from Dummett, op cit, p300
5 Dummett, op cit, p298
6 Ayer A J, op cit, p83
7 Malcolm N, 'Descartes' Proof that His Essence is Thinking', in Doney W (ed), op cit, p328
8 An illuminating insight into this debate is provided by Gilson E, in The Spirit of Medieval Philosophy, Chpt XIII, 'The Intellect and its Object'.
Chapter Seven

A NEW BEGINNING

Truth and the Problem of the External World

The emergence of the Cartesian conception of mind in Meditation Two marks a crossroad in the history of philosophy -- a turning point which presaged a radical change in the nature of the philosophic problematic and agenda. For with this move, traditional philosophical problems relating to truth and scientific knowledge were radically reformulated and relocated. The chain which ran from Plato and Aristotle through to Christian medieval Europe was broken, and a new chain begun. And whilst this revolutionary event obviously did not, once and for all, resolve the problems relating to truth and scientific knowledge, it radically recast and redefined the nature of the problematic.

Before moving on to a consideration of the argument of Meditation Three, I want to focus on the differences between the pre-Cartesian and Cartesian concepts of the mind and, at the same time, to explore briefly some of the implications of these different notions. In particular, I want to highlight the way in which the introduction of the Cartesian concept of the mind throws a new and different light on questions concerning truth and our knowledge of
the external world. For in this way we will be able to
more readily understand not only the dialectic of
Descartes' argumentative strategy, but also the point of
Meditation Three.

We have already seen that in pre-Cartesian Christian
philosophy it was generally held that it belongs to the
essence of the mind to become conformed to its 'proper' or
'natural' object. And here it is important to note that in
becoming so conformed, the mind was understood as 'coming
into conformity with the being of things', and this not in
an epistemological, but in an ontological sense. Thus in
the pre-Cartesian Christian debate it was held as common
ground that the first and proper object of the intellect is
'being' - *ens est proprium objectum intellectus, et sic est
primum intelligible. Questions concerning the sort of
'being' in respect of which it belongs to the essence of
the intellect to become conformed gave rise to the
characteristically medieval metaphysical distinctions
between the Divine Being of God and the 'analogous' being
of things and, subsequently, to the development by Duns
Scotus of the notion of 'univocal' being. While the nature
of these distinctions need not concern us here, it is
crucial that we recognize that the debate concerning them
arose out of, and acquired its importance, from a
commitment to the above canvassed view of the
intentionality of the intellect or the 'objects' of the
intellect. If, *per impossible*, there exists nothing
outside the intellect then, on this view, the intellect
could neither act nor be actual. (It is interesting to note here that on a model such as this, the mind could not be construed as a 'substance' in the Cartesian sense of the term because it lacks the necessary independence of being and action.)

The next important point to note is that on this pre-Cartesian model, the intelligibility of being is axiomatic. This axiom functions to guarantee that reality (i.e. what exists) is the sort of thing to which the intellect can become conformed and thus, that it is the sort of thing which can be known. (Here we might note that, given such an axiom, Heisenburg's principle of indeterminacy could not be held as 'scientific'. For it is inconsistent with this foundational axiom of pre-Cartesian 'science'.) Consistent with this, truth, on the pre-Cartesian model, was conceived as residing first and foremost in what exists, or in 'the being of things'. Consequently the real and the true were identified one with the other. This identification involves the claim that being is intelligible and, indeed, on this pre-Cartesian model, the intelligibility of being was considered axiomatic. Thus, as the mind became conformed to the existence of things it became conformed to truth. Accordingly truth, on this model, is in the intellect only derivatively. And if, per impossible, nothing existed outside the intellect, the intellect could not know truth; mind-independence is taken as a necessary condition of truth.
So it is that a starkly realist notion of truth is built into the foundations of pre-Cartesian Christian epistemology. However, with the emergence of the Cartesian conception of the mind and the corresponding rejection of the claim that it belongs to the mind's essence to become conformed with what is mind-independently extant, the parameters of philosophical debate were altered in such a way as to give rise, for the first time, to the possibility of developing a genuine anti-realist concept of truth. And this is so even though Descartes did not himself embrace an anti-realist concept of truth. For, instead, he introduces a concept of truth which is 'non-realist' in the sense that it apparently does not presuppose any realist extension of 'truth' and it is at least highly questionable whether knowledge of truth involves knowledge of mind-independent extants. Thus the problem of the external world becomes, for the first time, a problem for philosophy and Descartes can be credited with opening up the space which is now occupied by the contemporary realist versus anti-realist debate.

Crucial to the revolutionary transformation which effects this state of affairs is Descartes' argument of Meditation Two. For with this argument Descartes shows that we can know truth even if there exists nothing outside the mind. The concept of truth is thereby disconnected from any dependence upon the concept of the existence of mind-independent things. As a consequence, it is no longer coherent to speak of truth being in the mind only
derivatively. Thus the locus of truth is shifted and, like
the mind itself, the concept of truth acquires an
independence of, and indifference to, the existence of
things outside the mind. This is the point reached by
Descartes when, at the outset of Meditation Three, he says:

I am certain I am a thinking thing. Do I not
therefore also know what is required for my being
certain about anything? In this first item of
knowledge there is simply a clear and distinct
perception of what I am asserting; this would not be
enough to make me certain of the truth of the matter
if it could ever turn out that something I perceived
with such clarity and distinctness was false. So I
now seem to be able to lay it down as a general rule
that whatever I perceive very clearly and distinctly
is true. (CSM, Vol2,p24)

With this passage what I want to style here as a 'non-
realist' notion of truth is ushered onto the philosophical
stage. The conceptual nexus between existence and truth -
the 'real' and the 'true' - is broken, and the way is thus
opened for the development of an intuitionist or anti-
realist notion of truth. Concomitantly, the question of
the existence of the external world becomes a central
question for philosophy. And it is by way of closing the
der door to anti-realism and, concomitantly, establishing a
realist extension for the concept of truth, that Descartes
immediately proceeds to consider the problem of the
external world. Indeed, and as Descartes clearly
recognized, so important is this problem that the remainder
of his Meditations is devoted to its resolution.

This, then, is the essential dialectic of Descartes'
argument. In Meditation One, the concept of truth in play
is a starkly realist one according to which knowledge of truth necessarily involves, and quite literally delivers, the existence of things outside the mind. Following Meditation Two, however, an 'non-realist' notion of truth is brought into play – a notion which is such that our knowledge of truth does not necessarily (but may possibly) involve knowledge of mind-independent extants. Thus, although it can no longer be said that knowledge of mind-independent objects is necessarily delivered with our knowledge of truth, it is open to Descartes to claim that, as a matter of contingent fact, truth has a realist extension. Indeed, this is precisely what Descartes must establish in order to re-establish what was rendered dubitable by the skeptical arguments of Meditation One – namely, a firm and certain foundation for scientific knowledge, i.e. knowledge of mind-independent things. With this in mind, we can now more fully grasp, firstly, the nature of the problematic with which Descartes is concerned in his Third and subsequent Meditations and, secondly, the importance of his proof concerning the existence of God (= the Infinite).

Interestingly, this proof is one which crucially turns on considerations relating to infinitude and, by thus ascribing central importance to the notion of the infinite, Descartes effectively anticipates a major direction and turning point in the contemporary realist/anti-realist debate. For although it is quite beyond the scope of this work to provide an account of this debate, it is certain
that any such account would crucially involve a discussion of infinitude.

In Meditation Three (and again in Meditation Five), Descartes purportedly shows that knowledge of the existence of a veracious God can be secured. And in Meditation Six this knowledge is used to secure the conclusion that our ideas of corporeal things are produced in us by corporeal things which "possess all the properties which I clearly and distinctly understand, that is, all those which, viewed in general terms, are comprised within the subject matter of pure mathematics" (CSM, 2, 55). By this means Descartes re-establishes the link, broken in Meditations One and Two, between truth and the mind-independent existence of things. And with this link re-established, the claim that knowledge of mathematical truth involves knowledge of the external world or, what (empiricism aside) is the same thing, a realist extension for mathematical truth, is secured. This, in its turn, provides the foundation upon which the edifice of science can be re-constructed. Understood in this light, the dialectical and revolutionary nature of Descartes' strategy is at last exposed not merely as coherent but, even more crucially, as foreshadowing (and setting much of the agenda for) the central preoccupations of post-Cartesian philosophy.
It must, however, be admitted that Meditation Three, in which is made the pivotal claim that God exists and is not a deceiver, is widely considered to be the most problematic of all Descartes' Meditations. The argument is variously criticised on the ground that it is circular or, alternatively, logically unsound. The same argument cannot of course be both. Circularity in argument is after all, and as Harry Frankfurt points out, "essentially a matter of deriving a proposition from itself, and one is always entitled to do that". Thus, to claim that the essential argument is circular is to claim that it is at least valid. However, if it is circular then, while there can be no question about its logical soundness, there is a serious question concerning its strategical point; the price of circularity almost certainly being uselessness. For circular arguments are definitively unproductive: they cannot be used to prove or demonstrate anything; the absence of any genuine gap between recognizing the truth of the premises and that of the conclusion leaves us quite unable to travel epistemic distance with or within them. This is the point Frankfurt makes when he says:

Repeating at the end of a chain of reasoning something which was assumed at its start is not an error in logic, but it appears a gross error in strategy. To say the least, it can hardly amount to a very productive demonstration of anything that needs to be proved.
It is uncontroversial that there is a strong *prima facie* circularity in cartesian thought and as a consequence no account of Cartesian philosophy can afford to ignore this problem. And since, as we have seen, a circular argument is by definition valid, it seems that just in order to generate any question regarding its logical soundness it is necessary first to show that the argument is not circular.

Yet not withstanding these considerations it seems, on the face of it, easy enough to raise questions concerning the validity of Descartes' argument. For on his own account, the argument is one which utilizes a causal principle to demonstrate the existence of a veracious God. In the light of Hume's attack on the necessity of a cause there would appear to be a real question concerning whether this argument, at least, is logically sound. On the other hand, it certainly is not otiose; it is certainly not so constructed that there is no gap between recognizing the truth of what is given with the premise and what is given with the conclusion.

But of course the charge that Descartes' reasoning is circular, and therefore useless, depends on the claim that the point of Descartes' argument for the existence of God is to establish the reliability of reason or, what is the same thing, the truth of all we clearly and distinctly perceive. And, it is held, precisely by using a demonstration to establish the existence of God, Descartes
is thereby assuming the reliability of reason or the truth of all we clearly and distinctly perceive. On this reading Descartes' argument is not only circular, but viciously so. For, proponents of this view argue, by throwing into doubt the simple truths of arithmetic and geometry in Meditation One, the Deceiver argument of that Meditation throws into doubt the reliability of reason. Thus, it is claimed, Descartes is barred from assuming the reliability of reason prior to establishing the existence of a non-deceitful God. But since Descartes must assume the reliability of reason to prove the existence of God, he is caught, ex hypothesi, in a vicious circularity.

How a philosopher of Descartes' stature could have made such a blunder is not easy to understand. Some have attempted to explain (but not to excuse) this on the ground "that the argument is complex enough that its circularity is not obvious". Others have attempted to show that Descartes can be excused from this blunder on the ground that the circularity of the argument is intended by Descartes to indicate that it is philosophically irrelevant. It is, it is sometimes claimed, included in the Meditations not for philosophical but for political reasons. The most notable contemporary exponent of this view is Hiram Caton who has argued that the point of Descartes' argument concerning the existence of God is, primarily, to lend a patina of piety to a work which is radically subversive of religion.
To accept this latter view is to cede that the whole theological doctrine of the Meditations, including the Deceiver Hypotheses of Meditation One, is a detachable episode. However, putting aside the problems this involves, it is clear that neither of the above readings of Descartes' Meditations can be sustained if it can be shown that Descartes does not assume in Meditation Three anything which was rendered dubitable by the skeptical arguments of Meditation One and, further, that the conclusion of Meditation Three re-establishes something which was earlier rendered dubitable. For this would be to show that there is no circularity which stands in need of explanation, let alone mitigation.

Margaret Wilson sums up the dilemma with which we are here confronted in the following terms:

Descartes claims to see by the light of nature that deceptiveness is incompatible with perfection. Now what can this mean except that he sees - perspicuously or clearly and distinctly - a manifest contradiction in conjoining the ideas of (complete) perfection and deceptiveness? But if he can trust such perceptions, the proof is not needed. And if he cannot trust them, the proof is not possible. In other words, the argument can proceed only by presupposing what it is ostensibly trying to prove: that perceptions of a very high degree of evidence or perspicuousness can be relied on.  

On the face of it, one way out of this dilemma would be to show that Descartes does not need to prove that all clear and distinct perceptions are true, and thus that he is entitled to rely on them to establish the existence of a
non-deceitful God. However, this approach would generally be held to fail on the ground that, following the so-called Deceiver Argument of Meditation One, Descartes is not entitled to rely on the truth of all we clearly and distinctly perceive. For it seems, as Wilson puts it, that if the idea of God's omnipotence provides us with reason for doubting our mathematical intuitions, it seems to provide us with exactly the same reason for doubting any other intuition, including further intuitions about God Himself.  

In other words, it is Wilson's claim that if the doubt generated by Descartes' Deceiver Argument is capable of throwing into doubt the truths of arithmetic and geometry, then it must, by the same token, be capable of throwing into doubt the truth of all we clearly and distinctly perceive.

However, Wilson does point out that "Descartes can avoid circularity, or worse, only if the scope of his [Deceiver] hypothesis can be non-arbitrarily limited." And it will by now be apparent that this is precisely my claim: the scope of Descartes' Deceiver hypothesis can be non-arbitrarily limited. And it is thus limited just because the reasons the Deceiver Hypothesis provides us for doubting the simple truths of arithmetic and geometry in Meditation One do not provide us with reason for doubting, in Meditation Three, the truth of all we clearly and distinctly perceive. Further, I will show that with the conclusion that 'God exists and is not a Deceiver',
Descartes establishes something which was earlier rendered dubitable by the skeptical arguments of Meditation One.

In the following, I will therefore first examine the problem of whether Descartes' argument of Meditation Three assumes anything thrown into doubt by the skeptical arguments of Meditation One. I will then turn to the question concerning the point of the argument and show that the problem of the Cartesian circle cannot be ascribed to the 'real' Descartes but rather is -- crucially -- a problem *generated* by the assimilation of Cartesian philosophy into the problematic of post-Cartesian philosophy. By this means we will see both that the argument is useful (in the sense that there is a gap between recognizing the truth of the premises and that of the conclusion), and that it is legitimate in at least the sense that it does not involve a vicious circularity. This, of course, does not establish that the argument is logically sound in the sense that, as Dummett puts it "the process of recognizing the premises as true must already have accomplished whatever is needed for the recognition of the truth of the conclusion"\(^\text{10}\). However, only having reached the point where this consideration arises can it be sensible and coherent to raise any question concerning its logical validity.

Firstly, then, it is important to re-examine precisely what was and, more importantly, was not, rendered dubitable by the Deceiver Hypotheses of Meditation One. The central
The question here is that of whether, by throwing into doubt the simple ideas of arithmetic and geometry, the Deceiver Hypotheses rendered dubitable the truth-preserving nature of deductive reasoning and, therefore, the truth of all that is clearly and distinctly perceived. For if the latter of these is not in any way thrown into doubt, the charge cannot be sustained that Descartes is illegitimately assuming the reliability of reason to demonstrate the existence of God.

It is important to recognize here that my denial that the Deceiver Hypotheses rendered dubitable the truth-preserving nature of deductive reasoning does not amount to a denial that there is some other sense in which these hypotheses can be said to render dubitable the reliability of reason. Indeed, we have already seen something of what that other sense actually is. For we have already seen that in classical medieval philosophy the mind was characteristically construed as that the essence of which it is to become 'conformed with the being of things outside the mind' (or, what is the same thing, to 'become all things in an intelligible manner'). On this model, reason was held to provide reliable access to mind-independent objects just because it belongs to the essence of the mind to become conformed in an intelligible manner to that which exists. Similarly, it was held (mutatis mutandis), that because reason provides reliable access to mind-independent things, it belongs to the essence of the mind to become conformed to the 'intelligible being' of things. Although
circular, this is one way of explaining both the doctrine *adequatio rei et intellectus* and, concomitantly, why the question of the external world was not a problem for classical medieval philosophy.

Clearly, to suggest that reason may be unreliable in this sense is to cast doubt on the doctrine *adequatio rei et intellectus*. But it is not to cast into doubt the truth-preserving nature of deductive reasoning. This, then, is the distinction on which turns my claim that it is utterly unreasonable to construe Descartes' Deceiver Hypotheses as rendering dubitable the truth-preserving nature of deductive reasoning.

It is crucial therefore to bear in mind that, as we have already seen, the truths of arithmetic and geometry were thrown into doubt in Meditation One just because their truth was supposed to consist, not in their demonstrability, but in their conformity (or something of that sort) with mind-independent objects -- Forms, Ideas, Intelligible Essences or Species. This correspondence was supposedly secured by the prior (ontological) conformity of the intellect with the intelligible (aspects of the) existence of things. (Note that although such things were understood as mind-independent, this is not to say they were necessarily understood as existing in nature and thus as created by God.) Accordingly, on this reading the Deceiver Hypotheses prey on and destroy the doctrine central to classical pre-Cartesian philosophy, viz: that it belongs
to the essence of the mind to become conformed with the intelligible aspects (=existence of) mind-independent things.

However, with the introduction of an 'non-realist' concept of truth, such as that Descartes brings into play with the claim that 'whatever I perceive very clearly and distinctly is true', the Deceiver Hypothese are rendered harmless. For our knowledge of truth is no longer construed as necessarily involving mind-independent extants. Of course, this carries with it the consequence that the truths of mathematics can no longer be taken as necessarily delivering knowledge about the external world, and thus any realist extension for mathematical truth is in question.

This then is the dialectic we must keep firmly in mind as we seek to understand the passage in Meditation Three where Descartes appears to both affirm and deny that the truths of mathematics are dubitable. He begins:

Did I not see these things clearly enough to affirm their truth? Indeed, the only reason for my later judgement that they were open to doubt was that it occurred to me that perhaps some God could have given me a nature such that I was deceived even in matters which seemed most evident. (CSM,2,25)

Here Descartes is reflecting on his reason for doubting, in Meditation One, the simple and basic truths of arithmetic and geometry. In Meditation One, where an unequivocally realist conception of truth was in play, the
demonstrability of these simple ideas was not supposed to be constitutive of their truth. Although not irrelevant, their demonstrability was supposed only to constitute evidence that in apprehending such simple ideas, the mind is conformed with what necessarily exists (or subsists). That is, logical necessity was construed as derived from, and as evidence of, ontological necessity, e.g. the necessary existence of God. The point of the Deceiver Hypothesis can thus be understood as showing that their demonstrability is not, on the pre-Cartesian model, sufficient evidence to establish that our simple ideas of arithmetic and geometry conform with the intelligible aspects of the existence of mind-independent things. This of course is quite distinct from claiming either, or both, that we can doubt what is clearly and distinctly perceived, and/or that, given a 'non-realist' account of truth, we can doubt the simple ideas of arithmetic and geometry. Thus Descartes continues:

Yet when I turn to the things themselves which I think I perceive very clearly, I am so convinced by them that I spontaneously declare; let he who can do so deceive me, he will never bring it about that I am nothing, so long as I continue to think I am something; or make it true at some future time that I have never existed, since it is now true that I exist; or bring it about that two and three added together are more or less than five, or anything of this kind in which I see a manifest contradiction. (CSM, 2, 25)

In other words, not even an omnipotent God can cause us to doubt the truth of what is clearly and distinctly perceived. For while there is, at this point at least, no manifest contradiction involved in denying that there is...
any conformity between our simple ideas of arithmetic and geometry and mind-independent objects, there is a manifest contradiction in attempting to perceive clearly that two and three added together make more or less than five. Thus with their credentials secured by, and established in the light of, a 'non-realist' notion of truth, it is impossible to doubt that the simple ideas of arithmetic and geometry are true. However, since we can doubt that such truths have a realist extension or (what is the same thing) obtain in, or as part of, the external world, Descartes continues his argument thus:

And since I have no cause to think that there is a deceiving God, and I do not yet even know for sure whether there is a God at all, any reason for doubt which depends on this supposition is very slight and, so to speak, a metaphysical one. But in order to remove even this slight reason for doubt, as soon as the opportunity arises, I must examine whether there is a God, and, if there is, whether he can be a deceiver. For if I do not know this, it seems that I can never be certain about anything else. (CSM, 2, 25)

In the light of the post-Cartesian realist/anti-realist debate it may well be held that Descartes here understates the problem concerning the realist credentials of the extensions of mathematical truth. However, it is certain that the Deceiver Hypotheses of Meditation One are, to say the least, of slight concern to those who would establish a realist conception of mathematical truth. For as Descartes clearly recognises, it is one thing to remove this slight reason for doubting that such truths obtains in respect of the external world, but it is another altogether positively to establish that proposition. Thus, while the reason for
doubt is removed at the conclusion of Meditation Three, it is not until the conclusion of Meditation Six that Descartes claims to have established, in the light of clear and distinct perceptions, a realist conception of mathematical truth.

In short then, given the realist notion of truth operating in Meditation One, the truths of mathematics (merely evidenced by their demonstrability) are rendered dubitable by the Deceiver Hypotheses. However, given the 'non-realist' notion of truth introduced by Descartes in the Third Meditation with the claim that 'whatever is perceived very clearly and distinctly is true', the truths of mathematics (constituted by their demonstrability) are proof against any doubt generated by the Deceiver Hypotheses. While the sharpness of this dialectical transition is, to some extent, obscured in the translation we have been considering, it emerges very clearly from the Haldane and Ross translation, viz:

I am constrained to confess that it is easy to Him, if He wishes it, to cause me to err even in matters in which I believe myself to have the best evidence. And on the other hand, always when I direct my attention to things which I believe myself to perceive very clearly, I am so persuaded of their truth that I let myself break out into words such as these: Let who will deceive me, He can never cause me to be nothing while I think that I am, or some day cause it to be true to say that I have never been, it being true now to say that I am, or that two and three make more or less than five, or any such thing in which I see a manifest contradiction. And, certainly, since I have no reason to believe that there is a God who is a deceiver, and as I have not yet satisfied myself that there is a God at all, the reason for doubt which depends on this opinion is very slight, and so to speak metaphysical. (HR,1,158-9 - my emphasis)
Such a metaphysical doubt is, of course, of no concern in the contemporary realist/anti-realist debate. It is of slight concern to Descartes only because, by way of destroying the foundations of classical pre-Cartesian science, he introduced the notion in the first place. However, the primary point here to be noted is that what has been sacrificed in the transition from a realist to a 'non-realist' notion of truth is knowledge of the external world. This point Descartes makes when he says:

But there was something else which I used to assert, and which through habitual belief I thought I perceived clearly, though I did not in fact do so. This was that there were things outside me which were the sources of my ideas and which resembled them in all respects. (CSM, 2:25)

And thus the problem to be confronted at this point is that of the external world. Descartes' approach to this problem is, first, to demonstrate the existence of God (the Infinite) and, secondly, to use this to establish his central claim that the truths of mathematics obtain in respect of extended corporeal objects and, so to speak, stand to science as the trunk of a tree stands to the tree.

The Realist Credentials of Truth

We have now seen sufficient to show how, by situating Cartesian philosophy in historical context, we can grasp the revolutionary import of Descartes' philosophical dialectic and thereby resolve the problem of the so-called Cartesian Circle. For although the Deceiver Hypotheses
throw into doubt the realist credentials of the truths of arithmetic and geometry and Descartes is thereby barred from assuming any knowledge of the external world, he is not thereby barred from assuming the truth-preserving nature of deductive reasoning. Nor is he barred from assuming the principle of non-contradiction or any other so-called 'principle of our natural light'. Thus he is not barred from relying on deductive inference by means of which to establish the Cogito Argument of Meditation One. And, having thus established that our knowledge of truth does not necessarily involve knowledge of mind-independent extants, Descartes is thereby entitled to introduce a notion of truth which stands independent of the external world -- a notion I have characterised as 'non-realist'. With the introduction of this notion, the problems of the external world and the extension of mathematical truth become, for the first time, central problems of, and for, philosophy; no longer are these problems pre-empted by the philosophical notion of 'truth'. And it is from this realisation that we are able to recognize that the essential point of Descartes proof that 'God exists and is not a deceiver' is to secure the further claim regarding the extension of mathematical truth being constituted by mind-independent objects. Thus Descartes says in Meditation Six:

So I do not see how God could be understood as anything but a deceiver if the ideas [of body] were transmitted from a source other than corporeal things. It follows that corporeal things exist. They may not exist in a way that exactly corresponds with my sensory grasp of them, for in many cases the grasp of the senses is very obscure and confused. But at least
they possess all the properties which I clearly and distinctly understand, that is, all those which, viewed in general terms, are comprised within the subject matter of pure mathematics. (CSM,2,55)

On this reading, the argument of Meditation Three cannot be dismissed either as circular and therefore useless, or as a detachable episode designed merely to establish, in the eyes of the Church, the author's ideological soundness. For whilst Descartes certainly does not use this argument to re-establish the classical medieval doctrine that knowledge of what is demonstrative involves and presupposes a conformity of the mind with the intelligible aspects of the existence of things (such as Platonic Forms, Ideas, etc.), he does use the argument to establish that the extension of mathematical truth is constituted in the domain of extended objects. Thus while the argument is not circular, failure to recognize the part it plays in the transformation of the nature and status of mathematical truth can, as is evidenced by the weight of literature on the subject, lead to the (mistaken) charge that the argument is, on the contrary, not only circular, but viciously so.

Nonetheless, since it is very difficult to describe the nature of this transformation without resort to concepts developed and defined in the course of what has, this century, led up to and taken place in the realist/anti-realist debate, we can understand the real difficulty Descartes faced in providing a decisive refutation of the charge of circularity. For while we can readily
distinguish between the intension of a mathematic truth and its extension, the explication of the full nature and significance of this distinction was not available to Descartes; it was not then, as it is now (post-Frege, Carnap, etc., etc.) embedded in the universe of philosophical discourse. And, unable to draw on such fine-grained and detailed understanding of this distinction, Descartes is similarly unable to distinguish satisfactorily between the sense in which the truths of mathematics are indubitable and the sense in which such truths can be doubted even after having established the rule that 'whatever I clearly and distinctly perceive is true'.

However, he does of course, repeatedly insist that "my nature is such that so long as I perceive something very clearly and distinctly I cannot but believe it to be true" (CSM, 2, 48). Furthermore, he clearly senses that any doubt concerning the realist extension of the truths of mathematics involves, or presupposes, some sort of logical progression of a sort extending beyond what is generally given in a clear and distinct perception of a mathematical truth. Thus, in Meditation Five, Descartes speaks as if our certainty concerning the truths of mathematics somehow involves the reliability of memory which, in its turn, somehow turns on the existence of God. There, he says:

when I consider the nature of a triangle, it appears that its three angles are equal to two right angles; and so long as I attend to the proof, I cannot but believe this to be true. But as soon as I turn my
Here Descartes is clearly struggling to articulate some sort of distinction relating to mathematical truth. The argument can be rendered coherent by remembering that on the Cartesian model we need to be aware of God in order to establish a realist extension for mathematical truth. Thus the argument turns on our distinguishing between a clear and distinct perception that, say, the angles of a triangle are equal to two right angles, and the (realist) extension of this true thought. Whereas the former cannot be doubted, the latter can — unless, that is, we are aware of God and remember the proof by which God's existence is established. For *modulo* Descartes, God functions, first and foremost, to guarantee the realist credentials of mathematical truth and, only secondly, to guarantee the reliability of memory so that, when doing mathematics, we are not plagued by doubt concerning the 'realism' - mind-independence - of mathematical truth.

Thus construed, there is nothing circular about Descartes' argument. And in recognizing this we can once again identify the pivotal importance of, and turning point marked by, Cartesian philosophy in the history of philosophical debate — concerning, in this case, the nature of truth. Thus is historical integrity preserved and the 'real' Descartes revealed. And yet more importantly, we are thereby enabled to deepen our
reflective awareness of our own, contemporary, philosophical pre-occupations and parameters of thought.

The Principle of Causality

We now turn to the question of the logical soundness of the argument by which Descartes establishes the existence of God. For given that the problem of circularity cannot be ascribed to the 'real' Descartes, the question of whether his argument for the existence of God is logically valid takes on major significance. In the first place, we can no longer take it that, by virtue of its circularity, the argument is, at least in essence, formally valid. And in the second place, we can now see that this argument is crucial to Descartes' claim to have established, in Meditation Six, a realist conception of mathematical truth. Stripped of its religious overtones, Descartes claim is that through a consideration of the notion of infinity the realist credentials of mathematical truth are demonstrable.

The nature of Descartes' argument is, to some extent, obscured by the anachronistic jargon he employs and its apparently religious content. However, there can be no doubt that the argument of Meditation Three is one in which a principle of causality is employed to licence and secure a move from a 'real and positive idea of the Infinite' (that is, of God) to the conclusion that God exists and is not a deceiver. Although we might question the claim that any idea of the infinite can be a 'real and positive idea',
it is certain that such an idea provides the starting point of Descartes' argument. Similarly, although we might question Descartes' claim that a principle of causality is a principle of reason which can licence and secure any inference, it is certain that the argument of Meditation Three (as distinct from that of Meditation Five, where Descartes offers an alternative proof of God's existence) relies on such a principle. Although I will later examine what is involved in a real and positive idea of the infinite, I will first consider here the meaning, status and application of the principle of causality brought into play in Meditation Three.

Descartes introduces this principle when, in Meditation Three, he says:

Now it is manifest by the natural light that there must be at least as much <reality> in the efficient and total cause as in the effect of that cause. For where, I ask, could the effect get its reality from, if not from the cause? And how could the cause give it to the effect unless it possessed it? It follows from this both that something cannot arise from nothing, and also that what is more perfect - that is, contains in itself more reality - cannot arise from what is less perfect. (CSM,2,28)

The meaning of this claim is not transparent. But rather than confronting 'head-on' the problem of what is meant here, I will approach the problem indirectly with a view to eliminating certain misconceptions. For with these misconceptions cleared away we will be in a very much better position not only to grasp the meaning of the principle but also Descartes' entitlement to rely upon it.
This principle of causality is introduced by Descartes in the context of a discussion concerning the reasons we might have for affirming that mind-independent objects exist such that they correspond to what is represented in our ideas (or, what is the same thing, correspond to the 'objective reality' of our ideas). As Descartes put it, "the chief question at this point concerns the ideas which I take to be derived from things existing outside me: what is my reason for thinking they resemble these things?" (CSM,2,26). The discussion begins with Descartes' pointing out that although we have a strong natural tendency to assume that things exist outside the mind and which somehow imprint their likeness upon us, these natural tendencies are distinct from, and are not to be confounded with, clear and distinct perceptions. For whereas the latter are such that they cannot be doubted, the former are open to doubt. As Descartes puts it:

Whatever is revealed by the natural light - for example that from the fact that I am doubting it follows that I exists, and so on - cannot in any way be open to doubt. This is because there cannot be another faculty both as trustworthy as the natural light and also capable of showing me that such things are not true. But as for my natural impulses, I have often judged in the past that they were pushing me in the wrong direction when it was a question of choosing the good, and I do not see why I should place any confidence in them in relation to other matters. (CSM,2,27)

In other words, it is readily conceivable that by following our natural impulses we can be led into beliefs we can subsequently judge mistaken. We must therefore look to something other than natural impulses if we would establish
any certain knowledge concerning the existence of mind-independent things.

However, notwithstanding that our natural impulses may sometimes lead us astray, it may still seem that we are justified in claiming that ideas which, as it were, force themselves on us independently of, or even against, our will, are produced in us by mind-independent objects. In other words, if, as Locke was subsequently to maintain, there must be some exterior cause of ideas which "force themselves on me and which I cannot avoid having"11, we would be justified in claiming that the phenomenological fact that some ideas present themselves regardless of our will is sufficient evidence of the existence of external things. This view Descartes takes up (temporarily) when he says:

now, for example, I feel the heat whether I want to or not, and this is why I think that this sensation or idea of heat comes to me from something other than myself, namely the heat of the fire by which I am sitting. And the most obvious judgement for me to make is that the thing in question transmits to me its own likeness rather than something else. (CSM,2,26)

Descartes' subsequent rejection of this line of thought is unequivocal. Firstly, he reminds us that when dreaming ideas present themselves to us quite independently of our will. But since we can doubt that these ideas are caused by, and resemble, mind-independent things, we can similarly doubt a general rule of the sort subsequently put forward by Locke. Thus, argues Descartes,
although these ideas do not depend on my will, it does not follow that they must come from things located outside me. Just as the impulses I was speaking of a moment ago seem opposed to my will even though they are within me, so there may be some other faculty not yet fully known to me, which produces these ideas without any assistance from external things; this is, after all, just how I have always thought ideas are produced in me when I am dreaming. (CSM, 2, 27)

That is to say, since not all ideas produced by the mind are produced in accordance with the will, we cannot hold to any general rule to the effect that all ideas which present themselves to us independently of our will must, ipso facto, be produced by some mind-independent thing.

Furthermore, Descartes points out, even were we to grant that ideas which present themselves to us independently of our will are caused by external things, "it would not follow that they must resemble those things" (CSM, 2, 27).

This point Descartes illustrates by drawing our attention to the different ideas we have of the sun. "One of them", he says, which is acquired as it were from the senses and which is the prime example of an idea which I reckon to come from an external source, makes the sun appear very small. The other idea is based on astronomical reasoning, that is, it is derived from certain notions which are innate in me (or else is constructed by me in some other way), and this idea shows the sun to be several times larger than the earth. Obviously both these ideas cannot resemble the sun which exists outside me; and reason persuades me that the idea which seems to have emanated most directly from the sun itself has in fact no resemblance to it at all. (CSM, 2, 27)
In short then, we can doubt that ideas which "force themselves on me and which I cannot avoid having" resemble mind-independent things. Thus the conclusion seems unavoidable that:

All these considerations are enough to establish that it is not reliable judgement but merely some blind impulse that has made me believe up till now that there exist things distinct from myself which transmit to me ideas or images of themselves through the sense organs or in some other way. (CSM, 2, 27)

So far then it seems that the arguments of the skeptics must prevail: we cannot be certain that 'any of the objects of which I have ideas within me exist outside of me' and no realist conception of truth can be established. Here we should note that Descartes is clearly at one with Hume who, against Locke, maintained that there is no adequate basis in logic for the claim that 'there must needs be some exterior cause of ideas which force themselves on us and which we cannot avoid having'. Thus, whatever meaning attaches to the principle of causality Descartes employs, it is not this.

Yet while it is easy enough to understand what is not involved in Descartes' principle of causality, it is not so easy to understand what it does involve. Williams sheds little light on this difficulty when he says that in the degenerate terminology that Descartes employs, the cause of any idea must possess at least as much reality as the idea possesses, not only formally (intrinsic qua idea) but also objectively (in respect of its having a certain sort of object). If the cause has just as much reality as the effect, the reality of the effect is said to be present in it formally; if the cause has a greater degree of reality, it is said to contain the effect eminently.
Although this explanation is difficult to understand, we must resist the temptation to assume that this merely reflects the unintelligibility or incoherence of the principle itself.

In dealing with this issue, I will examine, firstly, some of the distinctions Descartes draws on by way of explaining the principle of causality he employs and, second, I will show that despite Hume's famous attack on the necessity of a cause, Hume himself assumes exactly the same principle in his foundational claim that there can never be anything in an idea that is not first in an impression of sense. Thus I will argue that in understanding and ceding Hume's foundational claim, we have thereby understood all that is needed to understand the nature of the causal principle Descartes employs. For we cannot consistently claim an adequate understanding of Hume's foundational claim and yet insist that the causal principle Descartes employs cannot be rendered intelligible.

Descartes himself gives various formulations of this principle. In Meditation Three we find the formulation "there must be at least as much <reality> in the efficient and total cause as in the effect of that cause" (CSM, 2, 28). In his reply to the Second Set of Objections, Descartes explains this by saying:

The fact that 'there is nothing in the effect which was not previously present in the cause, either in a similar or higher form' is a primary notion which is
as clear as any that we have; it is just the same as the common notion 'Nothing comes from nothing'. For if we admit that there is something in the effect that was not previously present in the cause, we shall also have to admit that this something was produced by nothing.... It is also a primary notion that all the reality or perfection which is present in an idea merely objectively must be present in its cause either formally or eminently. This is the sole basis for all the beliefs we have ever had about the existence of things located outside our mind.... (CSM,2,97)

This passage Descartes concludes by saying:

But there may be some whose natural light is so meagre that they do not see that it is a primary notion that every perfection that is present objectively in an idea, must really exist in some cause of the idea. For their benefit I provided an even more straightforward demonstration of God's existence based on the fact that the mind which possesses the idea of God cannot derive its existence from itself. (CSM,2,97-8)

From this it is clear that if the cause of an idea must possess at least as much reality as the idea possesses, then if any idea possesses more reality (whatever that is) than there is in myself, I cannot be the total and efficient cause of that idea. Thus, there must exist some mind-independent thing. So far, so good. But what is meant by 'more or less' reality? This question was raised by Hobbes, who said "M. Descartes should consider afresh what 'more reality' means. Does reality admit of more and less?" (CSM,2,130).

In his response to Hobbes, Descartes replied that he had already made it quite clear how reality admits of more or less. A substance is more of a thing than a mode; if there are any real qualities or incomplete substances,
they are things to a greater extent than modes, but to a lesser extent than complete substances; and, finally, if there is an infinite and independent substance, it is more of a thing than a finite and dependent substance. All this is completely self-evident. (CSM, 2, 130)

From this it is clear that the notion of 'dependence' is central to an understanding of any talk concerning 'more or less' reality. And in allowing, with the Cogito Argument, that a thought can neither be, nor be conceived, without a thing which thinks, we have allowed that the existence of a thought necessarily involves, and depends on, the existence of a thinking thing. Equally, since we can conceive that the continued existence of a thing which thinks does not necessarily involve the continued existence of any particular thought, it is clear that the continued existence of a thing which thinks does not necessarily involve or depend on any particular thought. Thus there is an asymmetrical relation of 'dependence' between a thought and a thinking thing. By the passage just cited, it follows that, in the jargon employed by Descartes, any particular thought possesses less reality than a thing which thinks.

However, of itself this does not seem much help to us in deciding whether any of our ideas are caused by, or resemble, mind-independent things. For given that a thing which thinks has more reality than any particular thought, there seems no reason to suppose that as a thinking thing I myself could not be the total and efficient cause of any thought which presents itself to me or which I construct.
Thus the principle that 'there must be at least as much reality in the total and efficient cause as there is in its effect' seems, on the face of it, incapable of enabling us to establish the existence of mind-independent things.

However, as Descartes points out, there are two quite distinct ways of considering ideas here. He says:

In so far as the ideas are considered simply as modes of thought, there is no recognizable inequality among them: they all appear to come from within me in the same fashion. But in so far as different ideas are considered as images which represent different things, it is clear that they differ widely. (CSM, 2, 27–8)

That is, as modes of thought, all ideas alike possess the same degree of reality and, in this sense, they are indistinguishable from one another. But they are distinguishable one from the other in terms of their phenomenological content; they are individuated, at least, by their respective intentional objects. This phenomenological content is characterised, in the jargon used by Descartes, as the 'objective reality' of the idea. Thus, ideas are distinguishable one from the other in terms of their 'objective reality'; they are all the same in being ideas, but what distinguishes them one from the other is their content.

Granted that the phenomenological content or 'objective reality' "existing in the intellect by means of an idea, is not an actual entity, that is, it is not a being located outside the intellect" (CSM, 2, 75), we may nonetheless
attribute different degrees of reality to the different things existing 'objectively' (or by representation) in the mind through the idea. That is to say, just as substance has more reality than mode, so, similarly, the idea of substance possesses 'objectively' more reality than the idea of a mode. Thus Descartes says:

Undoubtedly, the ideas which represent substances to me amount to something more and, so to speak, contain within themselves more objective reality than the ideas which merely represent modes or accidents. Again, the idea which gives me an understanding of a supreme God, eternal, infinite, immutable, omniscient, omnipotent and the creator of all things that exist apart from him, certainly has more objective reality than the ideas that represent finite substances. (CSM, 2, 28)

Understanding this, we are now in a position to understand Descartes' claim that there must be at least as much reality in the cause of any idea as there is 'objectively' in the idea. For by this principle it would follow that if I have any idea which contains 'objectively' more reality than there is in me myself, I cannot be the efficient and total cause of the idea. Thus, some external thing(s) must exist. In short then, like Hume, Descartes holds that the creative power of the mind is limited. But whereas for Hume what can and cannot be conceived is limited by what can and cannot be perceived by means of sense (the cause of our ideas), for Descartes, if any idea contains 'objectively' (or by representation) some reality which is not present in ourselves, we cannot ourselves be the total and efficient cause of that idea.
It remains a fact, nonetheless, that while this discussion serves to clarify something of the meaning of the jargon Descartes uses, it is unlikely to much advance Descartes’ cause in the eyes of the contemporary reader. And for this purpose I want now to turn to Hume and, by exposing not only the degree of analogy, but also the literal parallels between Hume and Descartes, we will be able to see the essential import of the principle of causality Descartes employs.

Hume, of course, is renowned for his attack on the necessity of a cause. It can therefore come as some surprise to discover that his Treatise On Human Nature, (which contains an attack on the necessity of a cause), begins with an argument offered as "proof, that our impressions are the causes of our ideas, not our ideas of our impressions". This claim, which asserts the necessity of a causal connection between impressions and ideas, provides the foundation of Humean empiricism. This being so, the way is opened up for us to see that both Descartes and Hume assume the same necessary relation of cause and effect. To be sure, where Hume begins with the assertion that "all our simple ideas proceed either meditately or immediately from their corresponding impressions", and by means of the principle of causality, proceeds to show that we cannot have an idea of the infinite or of a vacuum, Descartes moves in the other direction. That is, far from assuming the cause of all ideas, Descartes begins with an investigation of ideas with
a view to discovering whether, by means of a causal principle, the existence of any mind-independent things can be proved. And it is his claim that since we do, as a matter of contingent fact, have an idea of the infinite, then, by the same principle of causality Hume uses to show that we cannot have such an idea, the existence of the infinite (i.e. God) is demonstrable. Thus where Hume begins with impressions which he construes as the cause of all ideas, Descartes begins with ideas considered as effects. But the point remains that despite their different respective starting points, each employs the same principle of causality - something cannot come from nothing - to demonstrate what stands in need of demonstration.

For Hume, it follows from his proof that 'impressions are the cause of our ideas, not our ideas of our impressions', that, since we cannot point to an impression of infinity or a vacuum, neither can we have any such ideas. Thus at the conclusion of Part One of Book One of his Treatise of Human Nature, in which he discusses (and rejects) the infinite divisibility of space and time, Hume claims that we are mistaken in thinking that we can ever have any idea of the infinite or a vacuum, on the ground that we can never have an impression of these things. This argument he concludes by saying:

But that we really have no such idea is certain. For whence should it be derived? Does it arise from an impression of sensation or of reflection? Point it out distinctly to us, that we may know its nature and qualities. But if you cannot point out any such
impression, you may be certain you are mistaken when you imagine you have any such idea.\textsuperscript{16}

Given Hume's first principle, this claim must be held as uncontroversial. For to deny it would be to assent to the proposition that something can proceed from nothing.

Thus it is apparent, at least in the case of ideas and impressions, that Hume not only grants but assumes the necessity of the relation of cause and effect. For he applies to all our ideas the general principle that they can contain nothing that is not first in their cause. This principle is subsumed under his claim that:

\begin{quote}
though our thought seems to possess ... unbounded liberty, we shall find, upon a nearer examination, that it is really confined within very narrow limits, and that all this creative power of the mind amounts to no more than the faculty of compounding, transposing, augmenting or diminishing the materials afforded us by the senses and experience.... Or, to express myself in philosophical language, all our ideas or more feeble perceptions are copies of our impressions or more lively ones.\textsuperscript{17}
\end{quote}

Clearly what we see here is an agreement between Hume and Descartes on the claim that "there is nothing in an effect which was not previously present in the cause, either in a similar or higher form" (CSM,2,97). But where, for Hume, this 'higher form' in which things are present in the cause is characterised in terms of the "degree of force and vivacity"\textsuperscript{18} of our sense impressions, for Descartes it is characterised more generally in terms of a distinction between 'objective' and 'formal' reality, or greater and lesser 'perfection'. Thus Descartes says in Meditation
Three that

in order for a given idea to contain such and such objective reality, it must surely derive it from some cause which contains at least as much formal reality as there is objective reality in the idea.

And, amplifying this distinction in response to the First Set of Objections, he says:

'Objective being in the intellect' ..., will signify the object's being in the intellect in the way in which its objects are normally there. By this I mean that the idea of the sun is the sun itself existing in the intellect — not of course, formally existing as it does in the heavens, but objectively existing, i.e. in the way in which objects normally are in the intellect. Now this mode of being is of course much less perfect than that possessed by things which exist outside the intellect; but, as I did explain, it is not therefore simply nothing. (CSM, 2, 75)

Cutting through these verbal distinctions which, arguably, serve only to obfuscate and confuse, the essential point (held in common by Descartes and Hume) is that there can be nothing 'real or positive' in an effect that is not first in the cause. Thus given Hume's basic premise that impressions are the cause of all ideas, there could be no disagreement between Hume and Descartes that our 'ideas' of the infinite or a vacuum contain nothing real and positive but, in the jargon employed by Descartes, are 'materially false' ideas (i.e. ideas which represent what is nothing as if it were something). Where Hume and Descartes differ is not on the rule of inference but on the truth of the claim that all our ideas are caused by impressions of sense; only one of them is, after all, an empiricist.
It should however be further noted that if, with Locke, Descartes were to maintain a tabula rasa theory of the mind, or, with Hume, he were to maintain that all ideas are caused by impressions of sense, he would, as Hume has ably shown, have great difficulty in accounting for the necessity of a cause. However, since Descartes supports neither of the above claims it is open to him to account for the necessity of a cause in terms of an innate idea or an idea given with the nature and structure of the mind. This, of course, he does. For he explains that

... when we recognize that it is impossible for anything to come from nothing, the proposition Nothing comes from nothing is regarded not as a really existing thing, or even as a mode of a thing, but as an eternal truth which resides within our mind. Such truths are termed common notions or axioms. The following are examples of this class: It is impossible for the same thing to be and not to be at the same time; What is done cannot be undone; He who thinks cannot but exist while he thinks; and countless others. (CSM, 1, 209)

From this it is apparent that the principle of causality employed by Descartes has the status of an eternal truth or 'common notion'. The apprehension of such principles is given, in the jargon Descartes employs, by our 'natural light' and does not involve the apprehension of anything existing outside the mind. Thus, these principles are antecedent to scientific knowledge. Their nature is such that they can, in Descartes view, be clearly perceived. But, he adds,

some of them do not really have an equal claim to be called 'common' among all people, since they are not equally well perceived by everyone. This is not, I think, because one man's faculty of knowledge extends more widely than another's, but because the common
notions are in conflict with the preconceived opinions of some people who, as a result, cannot easily grasp them. But the selfsame notions are perceived with the utmost clarity by other people who are free from such preconceived opinions. (CSM, 1, 209)

Thus understood, we are able to see that Descartes has available to him the same sort of response to the question 'Why is a cause always necessary?' as that subsequently developed by Kant. For by construing the principles of our natural light as innate and given with the nature and structure of the mind, Descartes is claiming that they are given a priori. Thus he is, in effect, laying down the ground for the notion of a priori necessity which, subsequently, was to be given definitive form by Kant.

However, just because the common notions apprehended by our natural light constitute the source of necessity in Cartesian philosophy, it is with Descartes, rather than Kant, that we first see the shift in the locus of necessity away from what exists outside the mind. That is: with Descartes, logical (or a priori) necessity is not construed as derivative of necessary being - Platonic Forms or Divine Ideas - but as grounded in the human mind itself. Thus whereas for classical pre-Cartesian philosophy necessity was grounded ontologically and was in the human mind only derivatively, with Descartes, this direction is entirely reversed.

It is thus that we now see the meaning and locus of necessity of the causal principle employed by Descartes in
his argument of Meditation Three. It remains, however, for us to examine Descartes' application of this principle. We have seen that, unlike Hume, his starting point is not with some presumed cause of all ideas (i.e. impressions of sense), but with the ideas themselves. His concern in Meditation Three is not to discover some causal relation which holds good for all our ideas, but to discover (if possible) some idea of which we could not ourselves be the total and efficient cause. If any such idea can be discovered - if, that is, we can discover in any of our ideas some reality that neither is, nor could possibly be, present in ourselves - then the existence of some mind-independent object can be established.

Descartes begins his confrontation with this task thus:

"Among my ideas, apart from the idea which gives me a representation of myself, which cannot present any difficulty in this context, there are ideas which variously represent God, corporeal and inanimate things, angels, animals and finally other men like myself." (CSM,2,29)

These ideas all represent things existing in the external world. This, however, is clearly not of itself sufficient to justify the claim that it is precisely these things which are represented in our ideas. The question we must ask therefore, is whether there is anything represented in these ideas which could not be present in ourselves. For by the principle of causality, we can conclude that there is something in the external world which resembles what is represented in the idea, only if what is represented in the
idea could not possibly be present in ourselves.

Descartes considers first "ideas which represent other men or animals or angels" (CSM,2,29) and, on the ground that these ideas may have been formed by us "from the ideas I have of myself, of corporeal things and of God" (CSM,2,29) it is clear, Descartes argues, that we cannot conclude that anything exists in the external world which resembles these ideas. However, although these ideas are complex ideas which may have been constructed by us, it is appropriate to consider whether any of the various distinct elements contained in them is such that it could not have proceeded solely from ourselves. (Note here that and how the Humean distinction between simple and complex ideas is clearly analogous to and/or derivative from the distinction Descartes is presently drawing.)

Descartes thus next turns to a consideration of ideas of corporeal things. Of these ideas, he distinguishes between those which are clearly and distinctly perceived and those which are not. To the latter category belong ideas of sense such as those of "light and colours, sounds, smells, tastes, heat and cold and other tactile qualities" (CSM,2,30). These ideas are dismissed from consideration by Descartes on the ground that they may be 'materially false' - that is, they may represent nothing as if it were something. He explains:

For example, the ideas which I have of heat and cold contain so little clarity and distinctness that they do not enable me to tell whether cold is merely the
absence of heat or vice versa, or whether both of them are real qualities, or neither is. And since there can be no ideas which are not as it were of things, if it is true that cold is nothing but the absence of heat, the idea which represents it to me as something real and positive deserves to be called false; and the same goes for other ideas of this kind. (CSM,2,30)

This notion of 'material falsity' is an important one. For just as Hume was later to argue that our 'ideas' of a vacuum or the infinite are, as it were, non-ideas which do not have any corresponding cause in an impression of sense, Descartes argues that because some of our ideas are burdened with so much obscurity and confusion, there is no need to posit any corresponding reality as their cause. As he explains:

Such ideas obviously do not require me to posit a source distinct from myself. For on the one hand, if they are false, that is, represent non-things, I know by the natural light that they arise from nothing — that is, they are in me only because of a deficiency and lack of perfection in my nature. (CSM,2,30)

This claim that ideas can arise in us as a product of a deficiency or lack of perfection is rendered transparent when we consider the flashes of light and colour we 'see' following a blow to the head, or the heat we feel when in the grip of a fever or illness. For Descartes, then, any idea which is not clearly and distinctly perceived may be materially false and consequently cannot be employed to establish that one is not alone in the world.

Accordingly, Descartes turns to those ideas of corporeal things which are clearly and distinctly perceived:
The list comprises size, or extension in length, breadth and depth; shape, which is a function of the boundaries of this extension; motion, or change in position; to these may be added substance, duration and number. (CSM, 2, 30)

These ideas - ideas of ideal geometrical space - cannot be conceived as ideas which are "in me only because of a deficiency and lack of perfection in my nature" (as the result, for example, of a blow to the head), and thus they cannot be conceived as materially false. Yet while they are, as it were, the right stuff upon which to erect an argument, there remains the question of whether they are necessarily caused by some mind-independent reality. For to say that an idea is not materially false, is not to say that it must proceed from something existing outside the mind. Indeed, Descartes makes it quite clear that, to this point of the argument at least, the ideas of number and duration may proceed entirely from oneself qua a substance whose entire nature is to think. (This is not to say that I am a substance whose entire nature is to think, but rather that, even were this the case, I could myself be the total and efficient cause of the ideas of duration and number.) As Descartes says,

I perceive that I now exist, and remember that I have existed for some time, moreover, I have various thoughts which I can count; it is in these ways that I acquire the ideas of duration and number which I can then transfer to other things. (CSM, 2, 30-31)

Thus the ideas of duration and number may be caused by myself even if I am only a thing which thinks.
However, continues Descartes, if I am only a thing which thinks, it does not seem that I could myself be the total and efficient cause of the "other elements which make up the ideas of corporeal thing, namely, extension, shape, position and movement" (CSM, 2, 31). Yet even this, on Descartes view, is insufficient to establish the existence of external things. For while it has been established that I am a thing which thinks, for all we yet know it may be that these things (i.e. extension, shape, etc.) "are contained in me eminently" (CSM, 2, 31). While this notion of 'eminent' existence is difficult to grasp, it is sufficient for our purposes here to note that, on Descartes' view at least, the fact that I am only (necessarily) a thing which thinks, does not necessarily preclude the possibility that extension, shape, etc., may also (contingently) exist in some way in me. Thus, it may be that these ideas do not proceed immediately from, and resemble, things existing outside me.

Finally, and as Descartes says, "there remains only the idea of God: and I must consider whether there is anything in the idea which could not have originated in myself" (CSM, 2, 31). Only if this idea contains something which, demonstrably, does not exist in myself, can it be demonstrated by the principle of causality that some mind-independent reality exists. And since, argues Descartes, the idea of God involves "a substance that is infinite, eternal, immutable, independent, supremely intelligent, supremely powerful, which created both myself and
everything else (if anything else there be) that exists" (CSM, 2, 31), and as this is not a materially false idea (i.e. an idea which could conceivably have resulted from, for example, a blow to the head), then unless these attributes pertain to me, God exists. And since these attributes demonstrably do not pertain to me, God necessarily exists.

For many, this argument is singularly unpersuasive. Putting aside any religious (or other) prejudice, this is primarily because the two crucial moments in the argument are inadequately understood. Firstly, as we have seen, it is necessary to grasp the meaning, nature, and status of the principle of causality on which the argument turns. But even given that this is fully understood, if we cannot discover in ourselves the idea of God - or a real and positive idea of the infinite - the argument will fail to persuade because it remains essentially incomprehensible.

That we can have such an idea is, of course, denied by Hume on the ground that all ideas are caused by impressions of sense and we cannot point to any impression of the infinite. But since, unlike Hume, Descartes does not claim that impressions are the cause of all ideas, Descartes cannot be disqualified on this ground from claiming that the idea of God or of the infinite is not materially false. However, there still remains the question of whether the idea of the infinite is materially false - that is, an idea which represents nothing as if it were something - or real
and positive. This question is an important one which has a long and interesting history. And, by way of clarifying what is supposed to be involved in a 'real and positive idea of the infinite', I will briefly retrace something of its historical development in the following chapter.
Chapter Seven Footnotes

1. This identity of the real and the true is the thought which lies behind, and lends sense, to the remark ascribed to Jesus in John 14, verse 6 "I am the way, the truth and the life". (The Bible; King James version)

2. My point here is, of course, not that the problem of the external world had never been raised by philosophers. Rather, the point is that pre-Cartesian philosophy was unable, of its own resources, to address the problem. Thus any skeptic who raised the problem was obliged to resort to faith or the lessons of nature for resolution of the problem.


4. ibid p27

5. quoted from Curley E, Descartes Against the Skeptics, p98

6. Caton H, The Origin of Subjectivity, p126

7. Wilson M D, Descartes, p131

8. ibid, p131-132

9. ibid, p132

10. Dummett, 'The Justification of Deduction', in Truth and Other Enigmas, p 298

11. Locke J, Concerning Human Understanding, 4, xi, ii.

12. ibid


14. Hume D, A Treatise of Human Nature, Pk 1, Pt1, p5
15 ibid, p7
16 ibid, p65
17 Hume D, Concerning Human Understanding, Section 2, para 13.
18 Hume D, op cit, p2
19 ibid, Part 2, Section 3
Chapter Eight

God and Infinity

The Problem

In the preceding chapter I argued, inter alia, that Descartes needs to prove the existence of God in order to establish the realist credentials of mathematical truth and thus a foundation for scientific knowledge (or knowledge of mind-independent things). Indeed, so important is this proof that Descartes provides two different ways in which its conclusion is established. In the first, (given in Meditation Three), the conclusion that God exists is drawn, by means of a causal principle, from the idea of God. In the second, (given in Meditation Five), the same conclusion is purportedly shown to follow directly from what is given with the idea of God. Thus although distinct, these arguments each describe a 'system-foundational' movement on the part of the mind with the idea of God being the crucial point of departure. This idea is therefore one of critical importance.

It must, however, be admitted not only that (considered in itself) Descartes' own explanation of this crucial idea is less than satisfactory but also, at this date at least, that the idea has no accepted place in modern philosophy or
science. One way of accounting for this is to claim that the idea is simply incoherent. And such is the view put by Jean-Luc Marion. He argues that the determinations of the Cartesian conception of God, viz., infinitude, independence (causa sui), and perfection -- are mutually inconsistent. Thus he claims, Descartes' idea of God is incoherent. On this view the idea turns out to be (on Descartes' own terms) a composite idea which, like the idea of a square circle, is not only 'materially false' (i.e., an idea which represents nothing as if it were something), but an idea of an impossible object (or an idea which is necessarily 'materially false').

If correct, this is an utterly damning condemnation of Cartesian thought. For not only is the idea of God of pivotal importance in Cartesian philosophy but Descartes himself insists that it is not such that it can be conceived as 'materially false'. For Descartes, the idea of God is at least an idea of a possible object (or of an object 'capable' of existing). And although he grants that composite ideas do not have true and immutable natures (and thus may have inconsistent determinations), he claims that the idea of God has a true and immutable nature. Not merely are the determinations of this idea consistent but, moreover, like the properties or 'determinations' of the idea of a triangle, they are demonstrable. And while, on Descartes' view, we cannot grasp all that is intelligible in the idea of God -- or all of its properties or determinations -- we can, nonetheless, have clear and
distinct understanding of it. And this in just the same way that we can have a clear and distinct understanding of a triangle and some of its properties, without necessarily having grasped or demonstrated all of its properties. Indeed Descartes claims that "God provides much more ample and straightforward subject-matter for clear and distinct knowledge than does any created thing" (CSM, 2, 82).

There is thus a serious conflict between Descartes' and Marion's analysis of the idea here in question. And while it may be, as Marion argues, that Descartes is very seriously confused about this crucially important idea, it may equally be that Marion has just misunderstood both the nature of the idea employed by Descartes and the jargon he uses to describe it. They may just be talking about different things. Thus, rather than directly addressing the difficulties raised by Marion, I will first to explore the genealogy of the thought here in question and by this means show why Descartes characterises the idea of God as involving the determinations of infinitude, perfection and independence.

The task is not an easy one. However, contrary to Marion's claim that the idea here in play is "without known predecessor", it is not unique to Cartesian philosophy. Nor, perhaps somewhat surprisingly, can it be understood as an idea which rightfully belongs to the sphere of theology rather, that is, than to metaphysics. For what is central to this idea is a metaphysical analysis and development of
a 'real and positive' concept if infinitude. And as we will see, the idea here in question is one whose genealogy can be traced, notably, through the work of Nicholas of Cusa, Bruno, Descartes, Spinoza, Leibniz and, finally, Hegel. It is true that in the hands of each of these thinkers the idea is developed in different ways and takes on different complexions and aspects. Yet at the same time, a common thread is clearly discernible. Crucially, this common thread involves the development and employment of a 'real and positive' notion of infinitude, or a notion of the infinite which is such that it cannot be understood straight-forwardly as a negation of the finite (i.e. as that which is 'not-finite'). Rather, it must be understood as that which transcends but, at the same time, in some sense 'contains' and/or provides the Ground of all possible determination, limitation, finitude or negation. And because these possibilities are endless, the idea of the Absolute Infinite (= God) both gives rise to, but is distinguished from, a notion of infinity construed negatively as 'unsurveyability' or indeterminacy. Here we think of the Hegelian distinction between the Absolute Infinite which transcends all opposition, and the 'bad' infinite of endless opposition; of the Spinozistic distinction between Substance which is One and indivisible, and its infinite number of modes under an infinite number of attributes; or, finally, of the Cartesian distinction between God (= the Infinite) and the universe which is indeterminate.
Thus understood, and notwithstanding my earlier comment regarding its place in science, the thought here in question has been crucially significant in the history of science. For, as we will see, its development provided the philosophical ground which led to the rejection of the closed (finite) world of classical Greek 'science' and the development, in its place, of a concept of the actual universe as indeterminate or, in a sense, infinite. Thus I argue that despite the not inconsiderable difficulties involved in rendering intelligible the Cartesian idea of God (= the Infinite), it is not without significant content and we cannot, without temerity, dismiss it as incoherent.

However, not the least of the difficulties confronting us here relates to the jargon Descartes uses to describe and characterise this idea. For although, as we will see, the notion here in question emerged progressively out of a Christian development of Aristotelian thought, its emergence was not a straightforward development either of Christianity or of the thought of Aristotle. Indeed, notwithstanding its genesis, it became progressively clear that the idea of the Infinite (= God) is incompatible both with classical Greek thought and with important aspects of Christian doctrine concerning, for example, the creation (and radical contingency) of the universe. There is thus some incoherence in attempting to portray this idea in terms of an essentially Aristotelian and/or Christian universe of discourse. Yet this type of incoherence is an inevitable correlate of any major and radical development.
in science or philosophy -- an associate of any 'paradigm shift'.

This 'paradigm shift' has, however, largely been ignored by modern philosophy. And although, as Etienne Gilson correctly insists, the significance of the Christian development of the notion of infinity is such as to warrant serious philosophical attention, there is a general dearth of research available on the subject. Recognizing that it lies beyond the scope of this work to fill this gap, my aim in the following is (conservatively) to indicate something of the developments in metaphysics which gave rise to the concept of the Infinite (= God) employed by Descartes and which lends sense to the jargon Descartes uses.

In the following, I will first briefly highlight why the notion of the Infinite (= God) employed by Descartes is incompatible with the empiricist (finitist) claim that sense impressions or sensible objects are the source and foundation of all knowledge. I will then turn to consider something of the historical transformation which, under the impetus of Christianity, led out of, and away from, Aristotelian conceptions of finitude and infinitude. Accompanying this, I will show how the jargon of Aristotle came to take on new meanings and associations. This process importantly comes to a culmination, firstly, with Nicholas of Cusa who, in his book De docta ignorantia, attacks the finitist metaphysical foundation of classical Greek 'science', and secondly with Descartes, who posits
the Infinite (= God) as of foundational importance for modern science. Thus we will see that what is here at issue is not an essentially religious concept, but a metaphysical one -- and one which is of every bit as much significance for mathematics and physics as for philosophy.

**Hume: Infinity as a Negation of Finitude**

Hume was one who saw clearly the interconnection of mathematics, physics and our philosophical understanding of the infinite. In Book 1, Part 2 of his *Treatise of Human Nature* he not only showed that, starting with the finite (sense impression or sensible object), a real and positive idea of the infinite is impossible, but also that the infinite divisibility of space, time and number, must be rejected. Hume's argument begins with the claim that all ideas are derived from impressions of sense, and, since we can have no impression of the infinite, the idea of the infinite can only be formed as a negation of the finite. Thus the idea of infinity is necessarily a 'negative' idea. And since Hume held the finite as the source and foundation of all knowledge, he similarly held that no cognitive content is to be discovered in its negation. Thus the 'idea' of infinity is, for Hume, both negative and empty of all content. And since, by contrast, a 'real and positive' idea of the infinite is neither empty of cognitive content nor formed as a negation of the finite, the claim that we can discover such an idea, involves a rejection of the empiricist claim that the finite (sense impression or
sensible object) is the source and foundation of all knowledge.

Thus, and as Hume clearly showed, it is not possible consistently to hold that the finite is the source of knowledge and that we have a 'real and positive' idea of the infinite. To accept the former, is to reject the latter and vice versa. And, mutatis mutandis, just because Descartes claims that our idea of the Infinite is a real and positive idea (i.e. not such that it could possibly have been formed as a negation of the finite), he is thereby committed to the view that it is impossible that the finite could be the only source of knowledge. On this point there could be no dispute between such otherwise disparate thinkers as Hume and Descartes. We can thus see that although, as Hume argued, the rejection of the idea of the infinite involves a rejection of the actual infinite divisibility (and expansion) of the universe, the existence of a 'real and positive' idea of the infinite minimally involves the possibility that infinitude is mind-independently extant. On this point again, there could be no dispute between Descartes and Hume. Their point of difference focuses on the question of whether we must start with the finite or the infinite. And whatever position we take on this question will have, as we will see, significant impact on the cognitive content ascribed to both the idea of the finite and the infinite.
We have already seen that, unlike Hume, Descartes does not begin with the claim that the finite is the source of knowledge. Rather, he begins with ideas which he considers in terms of their phenomenological content (or 'objective' reality). Thus considered, he claims it is apparent that, as a matter of fact, we possess a real and positive idea of the infinite. That is, the idea is not empty of all real content, and thus cannot have been formed by means of a 'negation' of the finite. Rather, he holds, it must be the other way about - our idea of the finite is derived by means of negation from that of the Infinite. He says:

And I must not think that, just as my conceptions of rest and darkness are arrived at by negating movement and light, so my perception of the infinite is arrived at not by means of a true idea but merely by negation the finite. On the contrary, I clearly understand that there is more reality in an infinite substance than in a finite one, and hence that my perception of the infinite, that is God, is in some way prior to my perception of the finite, that is myself. (CSM2,31)

In other words, just because the idea of the Infinite has cognitive content, it cannot have been formed as a negation of the finite. Thus, the priority of the Infinite over that of the finite is, first and foremost, a cognitive one. For as he says,

how could I understand that I doubted or desired - that is, lacked something - and that I was not wholly perfect unless there were in me some idea of a more perfect being which enabled me to recognize my own defects by comparison? (CSM,2,31)

In short then, it is Descartes' claim that we could not have an idea of the finite as imperfect or as 'that-from-
which-something-is-lacking', unless we first had an idea of 'that-from-which-nothing-is-lacking', viz: an idea of the Infinite, the perfect, or God (call it what you will). For it is only in terms of the cognitive content given with the idea of the Infinite, the perfect, or 'that-from-which-nothing-is-lacking', that we can recognize the finite as imperfect or somehow privated. And since we do have an idea of the finite as 'that from which something is lacking', we must have a real and positive idea of the Infinite.

This conception of the finite as that which is somehow privated is, of course, nowhere to be found in Hume. Moreover, as we will see, it is in direct opposition to the Aristotelian view that finitude is the mark of perfection. This is not, as some have suggested, evidence that Descartes has somehow failed properly to assimilate the philosophy of Aristotle10. For under the impetus of Christianity there had occurred, in the period separating Cartesian philosophy from that of classical Greece, a major development in philosophy (of which Descartes was clearly not unaware11) concerning the cognitive content involved in the ideas both of the infinite and of the finite. And it is to this historical transformation I will now turn.

Existence: Finite or Infinite?

It is important to note at the outset that the transformation here in question is essentially in the
sphere of metaphysics rather than epistemology. Thus, the starting point is with the nature of existence as distinct, that is, from the nature of knowledge. And since, as we have seen, in the pre-Cartesian context the direction was always from existence to thought, the epistemological structure was essentially and unequivocally realist. Of course, this direction is now reversed with the result not only that the realist credentials of truth have been thrown into question but that new philosophical techniques and distinctions have been developed. And, while it would be an interesting exercise to explore the question of whether (or to what degree) our modern philosophical tools are capable of adequately representing the metaphysical development here in question, my purpose here is to highlight the essential genealogy of the Cartesian idea of the Infinite and the transformation in the meaning of the language Descartes uses.

**Classical Greek Thought**

Where for Hume, the starting point of all knowledge is with finite impressions of sense, for classical Greek thought the starting point is with the finitude of what exists. And the finitude of what exists, it was held, is not merely a contingent matter of fact. Rather, it was construed as a necessary consequence of all things being of some particular form or another. For on this model, to be an actual thing was to be 'informed' and thus of some definite, determinate and finite nature. As a consequence,
finitude was construed as a necessary determination of existence. Ivor Leclerc neatly sums up the position when he says:

> It was fundamental in classical Greek philosophy ... that to be, to exist, is to be definite, that is, to be limited in this way rather than that. Aristotle had made quite explicit what was in fact pretty generally agreed in Greek thought, that unlimitedness, unboundedness, indefiniteness, implied the unformed, [and] that which is without form,... as Parmenides had insisted, can neither be nor be thought.12

Finitude or limitation is thus not construed as a privation, but as a necessary condition of existence. Thus if, *per impossible*, we could have any real (or 'contentful') idea of the infinite it would be, by definition, an idea of an impossible object. But that we can have such an idea was denied on the ground that, in just the same way that everything that there is necessarily of some definite form or another, every idea must similarly be of some definite form or another. This point is explained by Leclerc when he says:

> the unformed implied the unknowable, the incomprehensible, for there can be no knowing what has no form to be grasped. To know an entity is to comprehend what distinguishes it, that is, to grasp that whereby that entity is distinct and separate (limited) from other entities.13

Since what is infinite is by definition unlimited, it is without any particular form. And since what has no form to be grasped is unknowable, the infinite is necessarily unknowable.
Thus far, it is apparent that this Greek/Aristotelian model is relevantly the same as that subsequently developed by Hume. The finite is first in the order of knowledge and, as a consequence, we can have no real and positive idea of it. And far from finitude being a mark of imperfection as Descartes claims, it is a mark of what is perfect, actual and complete.

However, as both Aristotle and Hume recognized, a model of this type is unable to accommodate the mathematical insight into the infinite. Recognizing this, Hume rejected the mathematical insight into infinity as altogether incoherent. Aristotle, however, took a different view, and in so doing he developed a metaphysic which involved a rejection of the law of the excluded middle. For, he claimed, the infinite is such that it neither exists nor does not exist. His argument is an interesting one and can be seen as foreshadowing in metaphysics, the post-Cartesian finitist/intuitionist claim regarding the potentiality of the infinite and the so-called 'fallacy' of the excluded middle.\(^{14}\)

Aristotle saw clearly that if everything which exists is necessarily of some particular form or another, (and thus by definition finite), it matters not whether reality is One (as Parmenides had maintained) or multiple, the infinite can neither exist nor can it be an attribute (or truly predicated) of what exists. The main points of Aristotle's argument are summarized by Leclerc as follows:
The universe conceived as an infinitely extended existent must be either compound or simple. Prima facie the more probable supposition is that it is compound. The plurality of sensible bodies we encounter are readily recognizable as divisible and composed of constituents. Since this divisibility and composition cannot go on indefinitely, we come to certain ultimate constituents which are the elements out of which all other bodies are made up. 15

In other words, Aristotle comes to something very like an atomistic view of the universe. But, he maintains, such a view is inconsistent with an infinitely extended universe. Leclerc explains:

The plurality of elements or elementary constituents must each be a fully and definitely existing entity. But if each is actually and definitely existing, this means that there must be a definite number of them, that is, they must be definitely numerable. The number may be vast (for instance, beyond the range of human numeration), but since each existent is definite and actual, their number must be definite, and this means in principle numerable. But that being the case, this implies that the number cannot be infinite, for the concept of the infinite is precisely that which cannot be gone through to the end, since the infinite is that of which there is no end. 16

In short, if the universe is made up of a plurality of finite individuals, the totality of such individuals must be, in principle at least, surveyable or numerable. Thus the infinite divisibility and expansion of the universe must be rejected. What, then, can remain of the mathematical insight into the infinite?

Aristotle's answer to this problem is nothing if not innovative. For by way of avoiding the need for an outright rejection of the mathematical insight into the infinite, Aristotle developed a notion of potential
existence. Following on this, he drew a distinction between, on the one hand, the actual and determinate nature of the forms and, on the other, the potential and indeterminate nature of matter. In this way, as we will see, Aristotle posits a sphere which is, in principle, unsurveyable and the subject matter of pure mathematics. And because neither existence nor non-existence can be predicated of matter, the metaphysical equivalent of the law of the excluded middle must be rejected. For while Aristotle insists that everything thing that there is finite, he maintains the subject matter of mathematics (viz. matter) is infinite and, as such it neither does nor does not exist. It occupies a middle ground characterised by Aristotle in terms of the 'potentiality' of matter.

This Aristotelian distinction between the actual and determinate nature of the forms, and the potential and indeterminate nature of matter, is best understood in terms of the distinction between a thing and a process. For the potentiality of matter is not such that it can be conceived in the same way we might think of a stone as potentially a statue - indeed, it cannot be conceived as any sort of thing at all. Yet in the same way that a day is essentially a process - a process in which only a small part (the present) is, or ever can be, actual - so similarly matter is construed as essentially a process of which only a small part is, or ever can be, actual. It is thus in principle unsurveyable. But whereas a day is a finite process -- that is, something which can be gone
Le Clerc sums up Aristotle's position:

The infinite is not as such an actual entity or being; and the infinite is not an attribute of an actual being. The infinite does not exist as actual at all. It exists as potential, and the potentiality pertains not to a thing, a 'this' (tode ti), a substance, as an attribute, but it pertains to a process. The infinite as potential refers to the process of going through. The 'potentiality' of the infinite means that the process is able to be actualized, portion by portion. And the 'infinity' of this potentiality means that this process of successive actualization of portions can go on indefinitely without an end ever being able to be reached.¹⁷

On this model then, the infinite can never be a complete, definite or actual thing. For this reason it is construed as necessarily imperfect. And because, on the Aristotelian view, matter (hyle), being mathematical, is infinite, its presence in anything is a mark of imperfection. By contrast, the perfect is complete: that from which nothing is lacking and to which nothing is wanting. And this perfection is an attribute of the forms which, being without matter, involve no potentially or becoming. They are, as it were, the really real: finite, definite and complete.

Descartes was clearly not unaware of this Aristotelian notion of the infinite as potentiality. Yet while he adverts to this notion and, further, entertains the thought that he may possess the potentiality for all the perfections which exist in God, he insists that the idea of
the Infinite (= God) contains nothing of potentiality. He says:

First, though it is true that there is a gradual increase in my knowledge, and that I have many potentialities which are not yet actual, this is all quite irrelevant to the idea of God, which contains absolutely nothing that is potential; indeed, this gradual increase in my knowledge is itself the surest sign of imperfection. What is more, even if my knowledge always increases more and more, I recognize that it will never actually be infinite, since it will never reach the point where it is not capable of further increase; God, on the other hand, I take to be actually infinite, so that nothing can be added to his perfection. (CSM, 2, 32)

Furthermore, pace Aristotle, Descartes argues that if the infinite were merely a potentiality, (or a process which can never be complete), we could have no idea of the infinite. For, he says:

I perceive that the objective being of an idea cannot be produced by potential being, which, strictly speaking is nothing, but only an actual or formal being. (CSM, 2, 32)

From this it is clear that on Descartes' view, the mathematical insight into the infinite cannot be secured by, or grounded in, the infinite potentiality of matter. Aristotle's attempt to accommodate the mathematical insight into the infinite is accordingly rejected by Descartes on the ground that, if the infinite can never be actual, we could never have an actual - real or contentful - idea of it. Here, once again, the Cartesian position is, in this respect at least, clearly consistent with that of Hume. For like Hume, Descartes steadfastly clings to the view that if we start with the finite, and identify this as the
'real and the true', we can never have a 'real and true' idea of the infinite. For if all that is actual is finite, the idea of the infinite can only be constituted as a negation of what is actual. It is thus necessarily a negative idea which, lacking content, can be neither a real idea nor an idea of anything real.

Of course, the language Descartes employs is reminiscent of Aristotle, but because there is nothing of potentiality in the Cartesian concept of the infinite, we can see clearly that the concept of the infinite Descartes employs cannot be an Aristotelian concept. But this is not to say that the notion Descartes employs lacks philosophical credentials. For philosophy did not stop with Aristotle and begin again with Descartes. And although the intervening period was largely dominated by Christian thought, it is in the appropriation and development of Aristotelian thought by Christian thinkers that we see the philosophical genesis of the idea of the infinite employed by Descartes.

This process was a gradual one. And the work of Plotinus played an important role in the progressive development and genesis of the Cartesian concept of the Infinite (= God). For although Plotinus accepted the Aristotelian claim that everything that there is finite, he posited the infinite as the source or 'architect' of all being -- as that from which all determination, form and finitude springs. And, as that from which all
determination springs, Plotinus held that the infinite transcends both existence and diversity. Thus, on his view, the infinite is necessarily One. However, since there is no knowing what has no form to be grasped, the One of Plotinus is unknowable. As Leclerc puts it: "Plotinus' doctrine, therefore, is that God or the One is 'beyond thought and knowledge and even what we can speak of as being' (Enneads, V, 4, 1)."

Christian Developments

The position developed by Plotinus provided a framework for a philosophical accommodation of the Christian creature/Creator distinction. For, modulo Plotinus, everything that there is derives its determinate form and existence from the One which is itself transcendent of all form or finitude in much the same way that, for Christianity, the creatures derive their nature and existence from a transcendent God. However, this model was not without its difficulties for Christian thinkers. For, according to Christian doctrine, although God transcends the finitude of things, God does not similarly transcend existence. Equally unacceptable to Christianity is the claim that the One is in essence (or necessarily) unknowable. What is unacceptable here is not that we, who are finite, cannot know God, but that God, which is infinite, cannot know itself.
Thus, under the impetus of Christianity, Augustine was to insist that the infinite (= God) does not transcend being, but merely the finitude of being. For, as Gilson explains:

Like most Christian theologians, Augustine conceives God as 'being'. The well known text of Exod. 3,14, which runs through the whole history of Christian thought, is accepted by him in its literal meaning. This alone was enough to separate him from Plotinus. According to Plotinus, the absolute first principle was the One, which he posited above even being. Now, in the mind of a Christian, there is nothing above God, and since we know from Scripture that God is HE WHO IS, we also know that the absolutely first principle is being. Naturally, Augustine admits that God is the One, but he does not subordinate being to the One; rather he identifies the One with being. 19

By identifying God (= the infinite) with being, Augustine challenged, and began the move which was to result in a breakdown of, the nexus between finitude and existence. This, in its turn, was to call for, and lead toward, an entirely new approach to metaphysics. For given a rejection of the nexus between finitude and existence, it is clearly no longer tenable to claim that, by virtue of their determinate, definite and finite nature, the forms of classical Greek thought can be identified as the actual, the perfect and the true. And, following this, the classical Greek distinction between form and matter must similarly be rejected. For matter can no longer be distinguished from the forms by virtue of its imperfection, potentiality and infinitude. And finally, by insisting that God does not transcend existence, Augustine opened the
way for the development of a positive notion of the infinite -- or a concept of the infinite which is not merely an empty negation of finitude.

Henry of Ghent was one who saw clearly that, by challenging the nexus between existence and finitude, the philosophy of Augustine called into question the metaphysical foundation of classical Greek thought. And conceiving metaphysics as the "science of being", Henry took up the challenge of Augustine and drew a distinction between two different ways of considering 'being', viz; "that which is being itself" and "that which is something to which being belongs, or may belong". Gilson explains: "The first kind of being is by itself, it is uncreated; the second kind of being is by another, it is created". Stripped of its religious aspects, this distinction is one between ontological dependence and independence. Of course, it also provides the metaphysical basis for the uniquely Christian distinction between God as that whose essence is identical with existence (and is thus independent), and the creatures whose essence is distinct from existence (and thus are dependent). However, we should note that on this model, the infinite is not understood as a simple negation of finitude, but as that which transcends the finitude of being. Thus, as Gilson explains, "Henry conceives infinity as the positive power whereby the divine being transcends all possible limitations". With this move, the Aristotelian distinction between the infinite and the finite is, in some
sense reversed. For no longer is the infinite construed as necessarily imperfect because, lacking determination, it can never be actual; instead, the finite is construed as necessarily imperfect because, being bounded and determinate, its existence is necessarily limited (and dependent on what is other to it).

This reversal of Aristotelian metaphysics called for, and gave rise to, a corresponding change in epistemology. For, as we have seen, pre-Cartesian epistemology was unequivocally realist. And just as for Aristotle, the finite is the first both in the order of being and in the order of knowledge, the claim that the infinite is first is the order of being gave rise to the claim that it is similarly first in the order of knowledge. Thus Duns Scotus was to argue that

instead of, as was previously done, starting from the concept of the 'finite' to arrive at an understanding of God as 'not-finite', [we must start] from an understanding of God as perfect (= infinite) to arrive by contrast with this at the status of the finite. Finiteness, definiteness, accordingly connotes limitedness in the sense of derogation from perfection, deficiency.22

For Duns Scotus (as for Aristotle), existence or perfection is first in the order of knowledge. But because existence or perfection is not for Duns Scotus (as it was for Aristotle) identified with the finite, the finite cannot be construed as first in the order of knowledge. Rather, it is construed by Scotus as derived, by means of negation, from the infinite. And thus construed, the finite is
understood as that from which something is lacking. Limitation is thus no longer a mark of perfection, but a mark of privation - of imperfection. Clearly thus construed, the finite can never be negated in such a way as to yield a concept of the infinite (or that-from-which-nothing-is-lacking). That is, we cannot, by means of negation, derive a notion of the Infinite = perfect from that of the finite = imperfect.

On the model we see developing here, existence (= God) is construed as Absolutely Infinite in the sense that it is absolutely unbounded - for there quite literally is nothing by which it could be bounded or limited (on upon which it could depend). Thus the notion of the Infinite here in play is such that it comprehends, in some (mysterious) sense, everything that there is. By contrast, the notion of the finite is the notion of that which is limited or bounded. Clearly, this is not a simple reversal of the Aristotelian equation of perfection with finitude and imperfection with infinitude. For it is founded on the development of an entirely new metaphysic which crucially involves both the rejection of the Aristotelian equation of infinitude and potentiality and the development of an entirely new concept of the Infinite. However, while this development so far is consistent with Christian doctrine, it provided the ground leading to a conception of the (actual) universe as infinite. And although, as we will see, the infinitude of the universe was distinguished from the Absolute Infinity of God, it is not at all clear that
this distinction is consistent with the traditional Christian creature/Creator distinction.

Nicholas of Cusa

Nicholas of Cusa brought to a culmination this transformation of classical Greek notions of finitude and infinitude. For he saw quite clearly that it involved a paradigm shift such that any finitist approach to 'science' must be rejected. In his important book De docta ignorantia, Cusanus explicitly argued that 'scientific' knowledge which does not involve a real and positive notion of the Infinite is really ignorance, 'learned ignorance'. This theme, which runs throughout the work of Cusanus, is summarized by Leclerc:

contrary to antecedent thought, we cannot attain to a sound and true understanding of the finite except in terms of the infinite, for the finite is not self contained and self subsistent but is utterly dependent on God, the infinite. Thus what usually is taken for knowledge - that is, what is attained by concentrating on the finite - is not really knowledge at all; it is ignorance, learned ignorance. True knowledge is in the first instance and primarily knowledge of God, the infinite, and from this knowledge we can attain to a real knowledge of the world, the finite.

Significantly, this same condemnation of classical Greek 'science' is picked up by Descartes in his Principles of Philosophy where he says:

Now since God alone is the true cause of everything which is or can be, it is very clear that the best path to follow when we philosophize will be to start from the knowledge of God himself and try and deduce an explanation of things created by him. This is the way to acquire the most perfect scientific knowledge,
that is, knowledge of effects through their causes. In order to tackle this task with a reasonable degree of safety and without risk of going wrong we must take the precaution of always bearing in mind that God, the creator of all things, is infinite, and we are altogether finite. (CSM, I, 201)

Although on the face of it, this looks rather like an attempt to base science on a concept of God and thus on religion, the essential thought here in play is that any 'science' which takes as its starting point the finite, must be rejected. And importantly, by instead taking the Infinite as the starting point of science, Cusanus argued that the closed (finite) world of classical Greek 'science' must be rejected in favour of a conception of the universe as, at least in a sense, infinite. It is thus to Cusanus that is ascribed the merit (or crime) of asserting the infinitude of the universe. And since, as we have seen, starting with the finite, classical Greek 'science' rejects the infinitude of the actual universe, such 'science' is, on Cusanus' view, nothing but ignorance, learned ignorance.

Cusanus' argument for the infinitude of the (actual or created) universe begins with a concept of the Infinite (= God) as that which transcends and contains all finitude in a 'coincidence of opposites'. Post-Hegel, we might think of this 'coincidence of opposites' - coincidentia oppositorum - in terms of a synthesis which contains both thesis and anti-thesis in such a way that their opposition is transcended. But Cusanus was a mathematician and he illustrates the concept by mathematical analogy. For, as he points out,
if one side of a triangle is extended to infinity, the other two sides will coincide with it. Again, if the diameter of a circle is extended to infinity, the circumference will coincide in the end with the diameter. The infinite straight line is thus at the same time a triangle and a circle.25

This analogy is designed to illustrate how the Infinite (= God) can transcend the determination and diversity of the finite without at the same time transcending existence. For the "coincidence at infinity of the triangle and the circle with the straight line" does not mean, as Leclerc explains, that they disappear in every respect. To the contrary, "they must in some respect remain for otherwise there would not be a 'coincidence'."26. In other words, although the being of finite things is, in some sense, contained, comprehended or 'enfolded' in the Infinite, in the Infinite the opposition (multiplicity, distinction and relativity) of finite things is transcended. Thus the Infinite (= Being = God) is unique, absolute and perfect.

This point is nicely brought out by Copleston when he says:

God is, for Nicholas coincidentia oppositorum, the synthesis of opposites in a unique and absolutely infinite being. Finite things are multiple and distinct, possessing their different natures and qualities while God transcends all the distinctions and oppositions which are found in creatures. But God transcends these distinctions and oppositions by uniting them in Himself in an incomprehensible manner. The distinction between essence and existence, for example, which is found in all creatures, cannot be in God as a distinction: in the actual infinite, essence and existence coincide and are one. Again, in creatures we distinguish greatness and smallness, and we speak of them as possessing attributes in different degrees, as being more or less this or that. But in God all these distinctions coincide. If we say that God is the greatest being (maximum), we must also say that He is the least being (minimum), for God cannot possess size or what we ordinarily call 'greatness'. In Him maximum and minimum coincide.
There is then, nothing relative about the Infinite. And this in just the same sense that there is nothing relative in the Hegelian Absolute Infinite - it is a unique synthesis which transcends all opposition and negation, relativity and plurality\(^2\).

However, just because the relativity, diversity, multiplicity and opposition of the finite is seen as transcended by way of being 'contained' or 'enfolded' in the divine simplicity of God (= the Infinite), it is also capable of being 'unfolded'. This 'unfolding' of what is 'enfolded' in the Infinite is, as it were, a manifestation or explicatio of the Infinite. The implication of this is evident - the existence of the universe is a manifestation of the infinite, the explicatio Dei. And, construed as the explicitio Dei, the universe must be infinite. For it would be incongruous to hold that the primary manifestation of the Infinitude of God is in some finite or bounded entity. Thus Cusanus argued that the fundamental character of the universe is an "interminate, endless, extensiveness"\(^2\).

The implications of a paradigm shift such as this are usually not evident at first but are progressively realized. And it says much for the genius of Cusanus that he recognized that, as a consequence of this new conception of the universe, the medieval anthropocentric or geocentric view of the universe must be rejected. Anticipating in this way the later findings of Copernicus, Cusanus argued that the claim that the universe has a centre is without
objective meaning. For such a claim presupposes that the universe is bounded. And since this presupposition must be rejected, the centre of the universe cannot be real but only apparent. Such an appearance, he argued, is a consequence of our fixed point of reference which, in a universe where all things are in motion, appears to be at rest relative to all other things. Thus, Cusanus maintained,

[t]he earth ... is really in motion, but because it constitutes our point of view, it appears to be stationary, and the celestial bodies appear to be in motion around it. Likewise, in an unbounded universe without a centre, there can be no fixed and immovable poles; relativity is universal.29

Nearly two centuries later at the time in which Descartes was writing, it had become apparent that the rejection of the closed world of classical Greek thought and the development, in its place, of a concept of the universe as heliocentric and boundless, posed a major problem, for Christianity. And in confronting this problem, the Church was confronting one of the greatest crises in its history. In the light of this, it is not surprising that Descartes should refrain from fully explicating the notion of God (= the Infinite) upon which Cartesian science is grounded. This is consistent with his renowned prudence, and is quite sufficient to account for the less than satisfactory nature of his account of this crucial idea. For Descartes was no confrontationalist. Not unreasonably, his concern was to establish that his position was not inconsistent with basic tenets of
Christian doctrine.

Thus although, like Cusanus before him, Descartes rejects the finite (closed) universe of classical Greek thought and distinguishes between the infinity or indeterminacy of the universe and the Absolute Infinity of God, he does not positively assert the infinitude of the universe. The term 'infinite' Descartes reserves for that which cannot in any way be bounded - i.e. for God (= Being). By contrast, he terms that whose boundaries (if they exist) we cannot perceive, 'indeterminate' or 'indefinite'. Thus for Descartes, God is Infinite but the universe is indeterminate; the former is surveyable in the sense that we can positively perceive that it has no boundaries, the latter is unsurveyable in the sense that it has no boundaries which are perceptible to us. Although Descartes makes clear his position on this matter in his Principles of Philosophy (CSM, 1, 202), in a letter to Chanut written 6 June, 1647, he indicates that he has some hesitation about publicising his position. He says:

I will try to write all I can say on this topic, provided I may be allowed to think that it is to you alone I am writing, so that my imagination may not be too clouded by veneration and respect.

He begins, defensively, with the recollection that:

the Cardinal of Cusa and many other doctors have supposed the world to be infinite without ever being censured by the Church; on the contrary, to represent God's works as very great is thought to be a way of doing Him honour. And my opinion is not as difficult to accept as theirs, because I do not say that the world in infinite, but only that it is indefinitely
great. There is quite a notable difference between the two: for we cannot say that something is infinite without an argument to prove this such as we can only give in the case of God himself; but we can say that a thing is indefinitely large, provided that we have no argument to prove that it has bounds.31

At this point Descartes then proceeds to argue that "it is impossible to prove or even to conceive that there are bounds to the matter of which the world is made". But, on the ground that "there may be some reasons which are known to God though incomprehensible to me", he refrains from an outright assertion that the world is infinite32. In short then, Descartes' position is that while we cannot positively assert that the universe is unbounded, we cannot perceive any bounds. But we can positively assert that the Infinitude of God is Absolute and unbounded because there quite literally is nothing which is not contained or 'enfolded' in the Being of God. There is thus a distinction between the Infinitude of God and the indefinite or indeterminate nature of the universe.

Although thus expressed, the distinction here in play is a very fine one, it is, nonetheless, real and important. Firstly, by contrast with the Infinitude of God, the 'infinitude' or indeterminacy of the universe of both Cusanus and Descartes, is of a kind with Hegel's 'bad' infinite. It can be thought of as an endless progression, a perpetuation of the finite, of opposition, diversity and relativity; it is unsurveyable in the sense that, no matter where we choose to stop, there is always something beyond.
In this limited respect, it is also of a kind with Aristotle's conception of the infinite. But whereas the Aristotelian infinite pertained to the potentiality of matter, there is a sense in which the actual universe now emerges as infinite. And this sense is such that the mathematical insight into the infinite can now be construed not as an insight into the potentiality of matter, but, mutatis mutandis, as an insight into the nature of the actual universe.

However, although this distinction between the infinite or indefinite nature of the universe and the Absolute Infinite (= God) arguably reflects and, in some sense, accommodates the Christian creature/Creator distinction, it (minimally) demands that we conceive this Christian distinction in a new way. For although on each model, God is both transcendent of, and immanent in, the universe, the universe can no longer be understood as radically contingent and suspended from the will of a transcendent God. This was clearly seen by Spinoza who argued that the universe is a necessary manifestation of God (= Substance) and, thus, that it is necessarily infinite.

Unlike Spinoza Descartes, however, insisted on the creative power of God. But since, on the Cartesian model, there is no real distinction between the divine will and the divine intellect, it is difficult to see what this creative power amounts to. For with the collapse of the distinction between the divine will and the divine
intellect, the distinction between the universe construed as a 'manifestation' and/or 'creation' of God similarly collapses. For this latter distinction turns on the former. It is thus that although, unlike Spinoza, Descartes nowhere explicitly asserts either that the universe is the necessary manifestation of the divine being or that it is necessarily infinite, he does quite clearly insist that the universe is dependent on God (= the Infinite) not only for its creation but, no less importantly, for its conservation. He says:

> it does not follow from the fact that I existed a little while ago that I must exist now, unless there is some cause which as it were creates me afresh at this moment - that is, which preserves me. For it is quite clear to anyone who attentively considers the nature of time that the same power and action are needed to preserve anything at each individual moment of its duration as would be required to create that thing anew if it were not yet in existence. Hence the distinction between preservation and creation is only a conceptual one, and this is one of the things which are evident by the natural light.

This somewhat surprising claim becomes quite intelligible if we take it that for Descartes there is no distinction between construing the universe as the creation and/or manifestation of God. For construed as the manifestation of the Being of God, the universe clearly cannot, even for a moment, exist without God. Thus far does Descartes take us. However since, on his own terms, the being of God is necessary, it is but a short step to claim that, construed as the manifestation of God, the universe must similarly exist necessarily. But of course, by taking this step Descartes would be taking up a position in clear opposition
to the Christian doctrine that the universe is radically contingent and suspended from the divine will. And, while there are strong philosophical reasons for ascribing to Descartes such a position, he would have had equally strong prudential reasons for not taking up such a position - or at least, for not making it explicit.

At any event we can now see that although the philosophical development of a 'real and positive' idea of the Infinite (= God) emerged out of a Christian 'working through' of classical Greek thought, what emerged is at odds both with classical Greek metaphysics and traditional Christian dogma. And it is crucially important that we do not allow Descartes' prudence and emphasis on the name 'God' to blind us to the central importance of this positive conception of the Infinite for mathematics and science. For in the context of science and philosophy, what crucially turns on this concept is not a point of Christian faith. Rather, what is here at stake is the philosophical basis for the realist extension of mathematical truth and the infinite divisibility (and expansion) of the (actual) universe.

**The Realist Extension of Mathematical Truth**

And it is an interesting fact that although the realist extension of mathematical truth is generally taken as axiomatic by modern science, the proof by which Descartes purportedly shows that science must so proceed, is
generally rejected by philosophy. There are, I suggest, several reasons for this rejection - some of which are internal to Cartesian philosophy, and others which are external.

Amongst the 'internal' reasons is, firstly, the problem of the so-called Cartesian Circle. This is a fundamental procedural difficulty to be overcome. For unless it can be shown clearly and distinctly that Descartes' reasoning is not circular, we are apt not only to dismiss the argument as philosophically faulty but, worse, to completely miss its point. However, as we saw in the preceding chapter, there is nothing circular about Descartes' reasoning and, as this becomes clear, the essential point of Descartes' proof for the existence of God is able to re-emerge, viz; the realist extension of mathematical truth and thus a new foundation for science.

The second difficulty concerns Descartes' use of a principle of causality to establish the existence of God (= the Infinite). For although in Meditation Five, Descartes offers an alternative proof which does not turn on any causal principle, if he is not entitled to rely on such a principle, his argument of Meditation Three is thereby exposed as unsound. Although it is not so clear that a definitive resolution of this problem is possible, in the preceding chapter I have shown why, pace Hume, Descartes is entitled to rely on a causal principle. For unlike Hume, Descartes is able to appeal to what is given a priori (in
the sense defined by Kant) by way of justifying his reliance on such a principle.

But the third, and in some respects the most philosophically important difficulty, is that of recognizing what a 'real and positive' idea of the infinite is supposed to be. For without an understanding of what is involved in this idea, we are simply in no position to understand Descartes' argument. And my purpose in this chapter has been to show that, while this idea is inconsistent both with the finitism fundamental to classical Greek thought and to aspects of Christian dogma, it would be rash thereby to dismiss it as incoherent. For although its place in the universe of philosophical discourse is decidedly tendentious, the concept is by no means without philosophic and scientific credentials. Indeed, whatever its philosophical difficulties, it was with its emergence onto the philosophical stage that the mathematical insight into the infinite first emerged as applicable to the actual universe. And this thought is foundational to the 'scientific' rejection of the closed world of classical Greek thought and the development of modern science. Thus, although at least in part 'disowned' by the Church, it is to Christian developments in philosophy we must look for an understanding of the conceptual shift which underpinned and gave rise to the universe of modern science.

Interestingly however, and reflecting the separation of
Science and philosophy generally, the universe of modern science has become divorced from its philosophical foundation. Significant in this process was a rejection by Sir Isaac Newton and his followers of the concept of the Absolute Infinite. In its place, Newton posited a Lord God whose dominion extends over all of an infinite creation. The picture thus developed was rejected and sarcastically parodied by Leibniz who pointed out that, on this Newtonian model,

> the Machine of God's making is so imperfect ... that He is obliged to clean it now and then by an extraordinary Concourse, and even to mend it, as a Clockmaker mends his Work ..."  

Yet despite the efforts of Leibniz, this picture gained ground. And although this could be construed as a victory for the traditional Christian view concerning the relation between God and the world, it has proved a pyrrhic victory. For Newton's God increasingly emerged as superfluous to science; a point famously made by Laplace who reportedly responded to a question from Napoleon concerning the place of God in science with the comment "Sire, je n'ai pas eu besoin de cette hypothèse."
Although Descartes offers different proofs of the existence of God, these proofs fall into two types. Thus, in response to the First Set of Objections, Descartes says that "there are only two ways of proving the existence of God, one by means of his effects, and the other by means of his nature or essence" (CSM, 2, 85).

Marion J-L, 'The Essential Incoherence of Descartes' Definition of Divinity', in Rorty A (ed), Essays on Descartes' Meditations

For a discussion of this point, see Curley E, Descartes Against the Skeptics, p147-151

Undoubtedly the best contemporary work (in English) on the subject is Ivor Leclerc's book The Nature of Physical Existence, George Allen & Unwin, 1972

Descartes' was clearly aware of the crucially important work of Nicholas of Cusa to which he refers in a letter to Chanut, 6 June, 1647 - see Kenny A, Descartes: Philosophical Letters, p221

Leclerc, The Nature of Physical Existence, p61

ibid
For a discussion of Intuitionism, the potentiality of infinitude and the fallacy of the excluded middle, see Russell B, Introduction to Mathematical Philosophy, (London and N.Y 1919); Heyting A, Intuitionism. (Amsterdam, 2nd ed, 1966)

ibid, p50-51
ibid, p51
ibid, p56
ibid, p63
Gilson E, History of Christian Philosophy in the Middle Ages, p70
ibid, p448
ibid, p449
Leclerc, op cit, p68
ibid, p72
see for example, Koyre A, From the Closed World to the Infinite Universe, p6, and Le Clerc, op cit, Chpt 5
Copleston F, A History of Philosophy, Vol 3, Pt 2, p44; see also Le Clerc, op cit, p74
Leclerc, op cit, p75
Taylor C, Hegel, p115
Leclerc, op cit, p81
ibid, p83
Kenny A, Descartes - Philosophical Letters, p221
ibid
32 ibid

33 Spinoza B, *Ethics*, prop 16

34 Letter from Leibniz to the Princess of Wales, 1715, in Koyre A, *From the Closed World to the Infinite Universe*, p235

35 ibid, chpt. xi-xii

36 ibid, p276
CONCLUDING REMARKS

I have attempted in this study to show that the relevance of the Cartesian *Meditations* to the concerns of twentieth century philosophy is not to be discovered by assimilating Cartesian philosophy into the contemporary philosophical context, but by firmly situating it in that of the seventeenth century. And this, not in the light of our commonly held, but historically conditioned, post-Cartesian view that the pre-Cartesian period was a 'dark age' in philosophy. For the historical context of Cartesian philosophy must be understood in the light of the work of the great scholars of the pre-Cartesian Christian period in just the same way, that is, that the context of twentieth century philosophy must be understood in the light of the great scholars of the so-called post-Cartesian period. Of course, this is not to say that we cannot draw on developments in post-Cartesian thought to throw light on Descartes' arguments, for Cartesian philosophy is, after all, the pivotal point which marks the demise of the Christian medieval tradition in philosophy and the birth of our modern approach.

We have, however, now seen that, precisely by divorcing Descartes' arguments from their historically conditioned philosophical context of the seventeenth century, they are
Viewed in this light, Descartes' strategy of methodic doubt appears, as Kenny, Williams and others have ably pointed out, as at best naive and, at worst, simply foolish. Its revolutionary purpose is lost, with the result that Descartes' arguments concerning the reliability of sensation and reason are seriously distorted. And thus distorted, their bearing on the concerns of contemporary philosophy is lost.

For as we have seen, thus regarded it appears that although, in his Dreaming Argument, Descartes claims that sensation cannot provide a reliable basis for scientific knowledge, he must subsequently retract this claim. For the claim is based on an argument to the effect that we cannot reliably distinguish dreaming from waking experiences. But since Descartes subsequently claims that we can, by means of an appeal to memory, reliably draw just this distinction, it seems his initial argument against the reliability of sensation must collapse. And despite attempts by scholars such as Frankfurt to show that Descartes' argumentative strategy is not as bad as it looks, its philosophical importance and/or relevance to contemporary philosophical concerns is, to say the least, difficult to recognize.

Further it seems that, with his doubt concerning the reliability of reason, Descartes casts himself irrevocably into a problematic morass. For although it is difficult, on this model, to see why Descartes should
want to cast into question the reliability of reason, this he apparently does. For it is certain that he introduces the hypotheses of a Deceitful God and a malignant demon and, by this means, purportedly shows that the most simple and basic truths of arithmetic and geometry are dubitable. And since Descartes makes it clear that these truths do not depend on things existing 'in nature', it appears that reason must, on Descartes own cognizance, be considered dubitable. Such a position as this is clearly something of a philosophical show-stopper and, not surprisingly, from this point on, the difficulties associated with Descartes' argument seem only to multiply. For if Descartes' Deceiver Argument is indeed supposed to render dubitable the reliability of reason, he clearly cannot (consistently) assume its reliability to prove his own existence or that of God. And although it has been argued that he relies not on reason but on an intuition to establish his own existence, he manifestly relies on reason to demonstrate the existence of God. And, worse yet, it appears that the major point of this proof is to establish the reliability of reason.

Thus construed, Descartes' argumentative strategy appears not merely circular, but viciously so. How the progenitor of a mistake so blatant and fundamental as this could reasonably be ascribed the status of 'founder of modern philosophy' is difficult to imagine. Indeed, it seems that the only way intelligibly to account for this is to suggest that such was the philosophical naivety of
Descartes' time, that his mistakes remained generally unremarked. Thus, Amelie Rorty's view that Descartes' arguments are best regarded as a development and authentication of the spirit of his time— that is, as arising out of a traditional (spiritual) meditational genre and moving toward a philosophical genre—seems unexceptionable. For thus regarded, Cartesian philosophy (for all its faults) represents the emergence of philosophy from a 'dark age' dominated by religiosity and prejudice. A view such as this appears as a natural outcome of the Anglo-American tradition in Cartesian scholarship and serves reassuringly, if somewhat inaccurately, to emphasize the philosophical distance philosophy has travelled since its emergence in the seventeenth century.

However, against this view, I have argued that the gap separating contemporary from Cartesian philosophy is not so great as it thus appears. For such was the success of the Cartesian revolution in science and philosophy that it militates against our recognition both of the extent to which contemporary philosophy remains trapped within an essentially Cartesian framework and, concomitantly, of the philosophical outlook it overturned and replaced. And I have shown that, by recovering the philosophical context out of which Cartesian philosophy arose, we are able not only to recognize Descartes' argumentative strategy as coherent, but to appreciate its full revolutionary importance. As a result, the extent to which contemporary philosophy represents a 'working through' of the Cartesian
problematic legacy becomes apparent.

For we have seen that, although the philosophy of the medieval pre-Cartesian period was essentially Christian in its outlook, it was, for all that, philosophy. And skeptical doubt is employed by Descartes as a means by which to overturn and destroy the realist foundations of the sciences of pre-Cartesian Christian Europe. His doubts concerning the reliability of sense and intellectual perception effectively challenge the medieval Christian view that such perceptions are constituted and defined in relation to the cosmic order and thus can secure a realist foundation for science. Thus construed, the point of both Descartes' so-called Dreaming and Deceiver Arguments is clear, and the problems which have come to be associated with them are dissolved. For Descartes' object is to establish a new foundation for epistemological realism and thus, for science.

As we have seen, on the pre-Cartesian Thomistic view, sensation was defined in relation to the cosmic order and was held, not only to provide the basic canon of scientific measurement, but to secure the realist foundation of science. Thus it is clearly important that the Thomist is able reliably to distinguish perceptions of sense from those of imagination. And the point of Descartes' so-called Dreaming Argument is to show that, on the Thomists' own terms, no such distinction can reliably be drawn and, thus, that experiences of sense collapse into experiences
of the imagination. As a result, sensation cannot secure the realist foundation of scientific knowledge. Consistent with this, Descartes claims that sensation must be understood, not as constituted and defined in relation to the cosmic order, but as impressions in consciousness. In this crucial respect experiences of sense are, for Descartes, indistinguishable from experiences of the imagination and thus can provide no realist foundation for science. And this point remains even though Descartes subsequently claims to be able to distinguish dreaming from waking experiences.

In his second skeptical argument Descartes takes up the characteristically pre-Cartesian neo-Platonist claim that the objects of our intellectual perception are simple and universal things - Forms or Ideas - which, although perhaps not existing 'in nature', exist independent of our perceptions of them. And as we have seen, the point of his Deceiver Hypotheses is to show that we may be mistaken in thinking that our intellect ever stands in a relation of conformity with such objects. Indeed, it may even be that such objects do not in fact exist. Thus Descartes rejects the neo-Platonist view that the foundation for epistemological realism (and thus, for science) is secured in and by an immediate intellectual perception of Forms or Ideas. Instead, he relies on demonstrative reasoning by which to establish, and on which to ground, epistemological realism and thus, a new concept of science.
The destruction of the characteristically pre-Cartesian notions of sense and intellectual perception had, as Descartes clearly recognized, significant consequences for science and philosophy. For although, on the one hand, it carried with it the destruction of the realist foundation of medieval epistemology and science, on the other hand, the way was cleared for the emergence of our characteristically modern notion of self-defining subjectivity. Thus, following his skeptical critique of medieval philosophy and science, Descartes ushered onto the philosophical stage a concept of the knowing subject whose existence is demonstrated, and essence defined, without reference to any other thing. Reflecting this, the medieval concepts of sense and intellectual perception were radically transformed and re-defined, not in relation to the cosmic order, but to the knowing subject. Thus our characteristically modern notions of sensation and reason emerged. And although modern scholars (such as Wittgenstein and others) have challenged Descartes' claim that the principles of reason are given by God with the nature and structure of the human mind, the primary point remains, viz. for Descartes, as for modern philosophy generally, the nature of reason (like that of sensation) is understood and defined, first and foremost, as a function of the knowing subject rather, that is, than of the cosmic order. Thus is the post-Cartesian debate between empiricism and rationalism distinguished from that of the pre-Cartesian period.
At this point it is appropriate to note that although, as Charles Taylor points out\textsuperscript{13}, the notion of a self-defining subject was not without precedents, Descartes gives it a significantly new twist. For unlike his skeptical predecessors, he does not rest content with a withdrawal from the world (or a suspension of judgement concerning it); rather, he seeks a rapprochement with it. And this, not from a position of subjection, nor of despair in the face of its baffling impenetrability, but from a position of intellectual autonomy. This new approach called for the development of new categories in terms of which the relation of the knowing subject to the world could be understood. Thus, and crucially, we see, \textit{inter alia}, a philosophical shift of focus away from the classical Christian creature/Creator distinction (and the Greek Form/matter distinction which had been incorporated into Christian thought). In its place the philosophical spotlight is shifted onto the characteristically modern distinction between mind and body and/or between the mind-dependent and mind-independent.

Although, by means of his proof that the things of which mathematics treats are truly recognized as external objects, Descartes purportedly bridged the gap marked by this distinction, his proof of this depends on the existence of God (= the Infinite). And since, as we have seen, Descartes proof of God's existence has not been incorporated into modern philosophy, the problem of the external world remains a central problem for modern
philosophy. Yet we should not forget that the conceptual space within which, *inter alia*, the contemporary realist/anti-realist debate is conducted, was generated by the rejection of the pre-Cartesian notions of sense and intellectual perception, and the emergence of Cartesian concept of the mind as self-defining subject.

It is apparent then that, notwithstanding the problems commonly associated with Cartesian philosophy, our own post-Cartesian philosophical framework has been significantly conditioned by Cartesian thought. For although it has come to appear as if contemporary philosophy has moved beyond, and stands outside, the Cartesian problematic legacy, such a view is grounded in a distorted understanding of Cartesian philosophy. Thus I have argued that we must re-appropriate Cartesian philosophy, not by abstracting it from its historical context, but by re-constructing the revolutionary dialectic which saw the overthrow of the classical medieval Christian outlook and the emergence of a new, characteristically modern, approach to science and philosophy. And if, by this means, we do not transcend our own historicity, we can at least deepen our reflective awareness of it. For the lesson to be learned from the success of the Cartesian revolution is surely this: if we would, in our turn initiate a counter-Cartesian beginning, it is not sufficient merely to criticize Cartesian philosophy; we must first recognize how we have been conditioned by it.
Concluding Remarks: Footnotes

1 For a discussion of this point, see Chpt 2 (above)
2 For a discussion of Descartes' Dreaming Argument and its interpretations, see Chpt 3
3 Frankfurt, *Dreamers, Demons and Madmen*, Chpt 3
4 For a discussion of Descartes' Deceiver Argument and its interpretation, see Chpt 4
5 For a discussion of the 'intuitionist' interpretation of the Cogito, see Chpt 5
6 For a discussion of the problem of the so-called Cartesian Circle, see Chpt 7
7 Rorty A, 'The Structure of Descartes' Meditations', in Rorty A (ed), *Essays on Descartes' Meditations*, p 1-20
8 For a discussion of the relation between Cartesian skepticism and pre-Cartesian philosophy, see Chpt 2
9 See Chpt 3 (above)
10 See Chpt 4
11 See Chpts 5 & 6
12 See Chpt 7
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