# MIND-BODY DUALISM IN THE PHILOSOPHY OF DESCARTES

# MIND-BODY DUALISM IN THE PHILOSOPHY OF DESCARTES

A Study of the Origins of the Mind-Body Problem

By

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## ABSTRACT

Prior to proposing a solution, it is necessary to first understand the problem which one is attempting to resolve. Many have wrestled to overcome the mind-body dualism of Rene' Descartes but few have made the effort to comprehend the factors which necessitated the Cartesian divorce between mind and body. To this latter task will I apply myself and this I propose to achieve by conducting an investigation for the main-spring which sets the Cartesian clockwork in motion.

If there is one central fact in the genesis of Descartes' thought, it must be his rationalism, his inherent trust in the process of reason as the guiding light in the search after truth. I will here conduct an examination of "reason" as it is unfolded in the Rules, which as a doctrine expounds Descartes' methodological approach to knowledge. I will then expand on the centrality of the Method and of reason, for Method is but an illustration of reason at work, by designating its importance as the foundation upon which Descartes' philosophy is built.

Having secured this general conclusion, I will then turn, in

my final chapter, to my main theme: the mind-body problem, and here argue that Cartesian dualism, like the philosophy in general, is grounded in Descartes' rational attempt to gain knowledge. Finally, it will be concluded that Descartes' concept of matter, of "body" as extension, a concept grounded in reason itself, is the very feature which leads to the formulation of the dualism of mind and body.

## ACKNOWLEDGEMENTS

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## ABBREVIATIONS

| | |
|---|---|
| CB | Descartes - Conversations with Burman. Translated by John Cottingham (Oxford: Clarendon Press, 1976). |
| HR | The Philosophical Works of Descartes. Translated by Elizabeth Holdane and G. R. T. Ross in 2 vol. (Cambridge: Cambridge University Press, 1911; reprinted 1975 and 1970 respectively). |
| Letters | Descartes' Philosophical Letters. Translated and edited by Anthony Kenny (Oxford: Clarendon Press, 1970). |
| Selections | Descartes: Selections. Edited by Ralph M. Eaton (New York: Scribner's, 1927). |
| Olscamp | Discourse on Method, Optics, Geometry, and Meteorology. Translated by Paul J. Olscamp (New York: Bobbs-Merrill, 1965). |

# INTRODUCTION

There are many perplexing questions in the discipline which has as its goal perfect knowledge or wisdom, that is in philosophy. There are complex difficulties which center around the knowable, its nature, structure, limitations, and acquisition. There are perennial concerns such as what constitutes the ethical and (or) social good. But one problem which is of particular concern not only to philosophers but to all men is that of our nature as men, as living individual persons. For this, above all, is what all of us as living functioning identities, whether conceived of as spiritually animated bodies or as biological mechanisms, reduce to. We are all, from a common sense point of view, individual persons. But yet, curiously enough, a problem which constantly confronts us is our inability to adequately explain our very nature as persons. This is a problem which necessarily concerns all of us and which I will here attempt to understand. It is not my purpose in this thesis to present or defend a theory, but rather to try to understand why it is that when philosophers, or for that matter, when anyone speaks of persons the categories "mind and body" almost always are granted the central position in ensuing discussions.

That I, a person, am an individual thing is beyond doubt. And yet, when I endeavor to understand what kind of thing it is that I am, almost without exception the terms "mind-body" are employed in the expressing of this thing that I am. Thus, though I am one, this "one-ness" is comprehended within the scope of dual terms, or, if these terms are to be understood as representing two distinct substances, this "one-ness" must be comprehended within the scope of two distinct natures. Some philosophers, namely the dualists, have thought the person to be a unity of two such natures. Others have attempted to reduce the individual into either one or the other category. Idealists or mentalists have hoped to express the thingness of a person as "mind" only, while materialists or philosophic behaviorists try to formulate an explanation solely in terms of "body". It is this latter view which is currently prevalent both in philosophy and in psychology. However, to adequately judge the validity of this or any other theory, it is important to first understand what factors make this distinction necessary, then with these as a criterion one can judge any theory on the basis of how adequately it accounts for these factors along with the apparent unity of the person.

Formulated in terms of a question, the object of this inquiry then is: what factors lie at the basis of our dualist terminology, or what presuppositions led to the formulation of dual categories? In uncovering these one will at once comprehend what must be accounted for

in order to adequately explain the nature of persons. But where does one begin? It was in the philosophy of Rene Descartes that the dualism of mind and matter was expounded, in Quinton's words, "with a clarity and definiteness that has never been improved on."[1] Thus although Descartes may not have been the first to propose a dualist theory, Plato and Augustine before him emphasized the distinction between the soul and the body, the very clarity of his expression leads one to believe that if anywhere, it may be here that our inquiry must begin. But perhaps a more important reason for beginning here would be that the mind-body problem, as it is known today, is itself a result of Descartes' unsatisfactory attempt to reconcile his dualism of mind and body with the unity of the individual. Thus beyond any clarity of expression it would be this root in Cartesianism which requires that my inquiry be directed towards the philosophy of Descartes.

The main body of this work will consist then in an investigation of Descartes' philosophy, the purpose of which is not only to illuminate the nature of mind and matter but also to determine what factors led to the formulation of Cartesianism and the mind-body problem. It is my belief that the object of our search will be brought within our reach through an answer to the following question. Any student of Descartes should be well aware that the corpus of his thought extends over a variety of subjects; for instance, philosophy, science (physics), mathematics, and geometry. Now, I ask, what is the connection

between these various disciplines? That Descartes conceived of these as connected, of all knowledge as being connected, will be made abundantly clear. And yet, what is important is why Descartes conceives these as conjoined, as parts of one system.

Where does one begin to look for the yoke that binds these shafts together? Let us accept, for the present, Descartes' statements that Method* is at the basis of his search for truth, of his theory of knowledge. And with this lead let us look at Descartes' Method for that factor which will explain his unified concept of knowledge. And this, it will be discovered, is nothing other than human reason itself. But for reason to acquire knowledge, what is required is a subject which knows and an object which is known. Thus Descartes' concept of knowledge leads to an account of reason, and to mind (the subject) and hence to mind and body.

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*Here and throughout this paper, "method" refers to Descartes' particular methodology as presented in the Rules.

## Chapter I

## THE HISTORICAL INFLUENCES

### 1. Background

Of primary importance when conducting a detailed investigation of a philosophy, and in particular that of one who has had such a profound influence as René Descartes is the uncovering of the intellectual trends which mark the period into which the philosopher is born. For no man transcends the bounds of history and no thought is radically ahistorical. And although some, like Descartes himself, may have turned their backs upon dominant historical modes of thought, their rejections have their historical reasons.

Born in Touraine, at La Háyé, in March 1596 to Joachim Descartes, was a weak sickly child named René. This disposition accompanied the young Descartes throughout his first twenty years of life. At the age of eight (1604) René was sent to the college of La Fléche and there until 1612* he studied and received his formal academic education.

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*There is some question as to the certainty of these dates. The above is supplied without reference by Copleston, A History of Philosophy, Vol. 4, (New York: 1963), 74. Caton, The Origins of Subjectivity, (New Haven: 1973), xv outlines a chronology of Descartes' life adapted from Sirven, 1926, and Alquie, 1950. And here the dates are 1606-1614.

According to college manuals, the curriculum was eseentially constituted by "sound Aristotelianism" and in particular the central theses of Thomas Aquinas.[1] These teachings comprised the "Scholasticism" upon which the mature Descartes turned his back. This though is not to claim that as a pupil Descartes had once accepted this doctrine, for it is evident that even as a student Descartes was unsatisfied with these teachings (HRI, 83-86).

As with all general terms or "ism's", the term "Scholasticism" is difficult to define.[2] Roughly, this philosophy forms one group among the many which existed in the Middle Ages and is characterized by such noted philosophers as Anselm, Alexander of Hales, Bonaventure, Thomas Aquinas and Duns Scotus. What tied these philosophers together was a basic and shared Aristotelian metaphysics. Though perhaps not pure, this metaphysical framework was to dominate the Middle Ages.

This, in general, was the tradition upon which Descartes turned is back. Two developments which may have influenced Descartes in this will be here examined - the revival of scepticism and the rise of the "new science", both occurring in the century preceding Descartes' own lifetime.

Beside the dominant Aristotelianism, the Church also had a powerful influence on the development of thought in the Middle Ages. Together these two forces shaped the thought of this period. It was not that the Church's teaching were intrinsically compatible with

Aristotelianism, rather the Middle Ages was characterized by incessant attempts to reconcile their differences. And although there were always dissenting philosophies, none succeeded in challenging the authority of these powers.

It wasn't until the Reformer's challenge of the early 16th century that the dogmatic teachings of the Church were openly and seriously questioned. Martin Luther was the first to break with the Church and to establish an independent standard of religious knowledge. This break, according to Popkin, in challenging the accepted criteria, that is the authority of the Church, had the effect of raising the fundamental question of how one justifies the basis of one's knowledge and led to a sceptical crisis not only in theology but in other areas of human knowledge as well.[3] The rediscovery of the writings of the Pyrrhonian sceptic Sextus Empiricus, the first modern Latin edition of the Hypotyposes appearing in 1512 and published by Henri Estienne,[4] deepened the need for an acceptable criterion and stimulated a quest for certainty "that gave rise to the new rationalism of Rene Descartes."[5] Thus Popkin views the writings of Descartes as an answer (though unacceptable) to the rise of the "nouveaux Pyrrhoniens".

The most significant figure in the revival of ancient scepticism, according to Popkin, was Michel de Montaigne (1533-1592). In the Preface to his work, Popkin contrasts Academic and Pyrrhonian scepticism. The former claims that no knowledge is possible, while the latter

declares that the evidence to determine if any knowledge is possible is itself insufficient and inadequate; thus, the only possible recourse is to suspend judgement on all questions concerning knowledge. It is this latter form of scepticism to which Montaigne adheres.

Montaigne conceives man as a "miserable and wretched creature" whose understanding, that is the faculty of understanding, is no more fit than that of animals; that is that man in nature is no different than the animals around him - he possesses no special faculty with which to comprehend the 'truth'.[6] Knowledge, for Montaigne, is a product of custom, not of reason, and beliefs an impression of the mind. And because custom changes, the opinions of man likewise "have their revolutions, their seasons, their birth, and their death".[7] In the light of this constant fluctuation, Montaigne asks what powerful and permanent authority can be described for man's beliefs. In his search for a criterion of truth, after dismissing custom and culture as a valid criterion, Montaigne approaches the heart of the matter

> Now all knowledge is addressed unto us by the senses, they are our maisters ... The senses are the beginning and end of human knowledge.[8]

All knowledge comes to us through our senses, this is the source and extent of our knowledge. With regard to the power of human reason, Montaigne obviously believes it to be insufficient, for the expressed purpose of his work An Apologie of Raymond Sebond is to vindicate

Sebond from the charge of weak reasoning by showing that all reasoning is weak and that no certainty can be achieved by rational means. It would be too great a task within the scope of introductory material to detail Montaigne's argument against rationality, or man's ability to obtain knowledge through the use of reason. However, his general design is to proceed by comparisons. His method throughout is similar, if not an imitation of Sextus' method of "setting things in opposition".[9] Man is compared to animals, opinion to opinion, until finally a shadow is cast on all man's abilities and beliefs. The overall effect of this is to belittle man, to make him appear small and insignificant, even foolish. In this way, which perhaps may not be the most sound philosophical approach possible, Montaigne shows that man's claims to wisdom are mere pretensions and that no criterion can be secured on which to anchor the 'truth'. Thus, Montaigne casts a long sceptical doubt over the ability of mankind to discover absolute knowledge.

Not reason, nor eternal essences provide the foundations of our knowledge, but sensation alone. However, after elaborating this position Montaigne declares that the senses themselves are uncertain and falsifiable.[10] Hence Montaigne concludes that both the "inward and outward parts of man [his rational ability and sense experiences] are full of weakness and falsehood".[11] Thus no certainty can be established, no criterion of truth can be secured.

But all of this is restricted to a specific situation, that is it

applies only when man acts by his "owne weapons" and without the grace and knowledge of God. All is open to doubt, no standard of truth can be affirmed, what remains then is to accept tradition, to accept the "Catholic rule of faith". In this way Montaigne's Pyrrhonism becomes a "Catholic Pyrrhonism". Since no standard of truth is discoverable, faith in God and His word is the only recourse open to us. In Popkin's words, Montaigne "offers a total scepticism as a 'defense' of the Catholic rule of faith".[12] Without faith man is lost in a sea of uncertainty, with faith he is given a divine foundation, a source and path to guide his life.

Thus the spread of Pyrrhonism through Montaigne and his followers: Pierre Charron, Leonard Marandi, Francois de la Mothe Le Vayer, among others[13] had the effect of discrediting all rational grounds for certainty. Man, without the divine grace of God, cannot on his own obtain true knowledge. Reason, sense experience, neither of these can ascertain the truth. Without God, who is revealed only by faith, no criterion of truth can be established. Man operating on his own powers alone cannot come to know the truth. These are the conclusions that are to be reached by the sceptics' arguments. And it can be seen at once the difficulties that one (like Descartes) would have if he indeed attempted to challenge the sceptics as Popkin claims and assert that man by his own powers is capable of discovering

the truth. We shall view Descartes' criterion of truth at a later time, for now it is sufficient to state that for Descartes man can arrive at true knowledge through his own power of reasoning. Of course, God does play a role in Descartes' theory of knowledge, but God himself is not accepted on faith by Descartes but is established as certain by man's own rational ability.

In spite of the above sceptical claims with regard to man's ability to discover knowledge, a new light was at the same time beginning to dawn, that of the "new science", that of experimental science in which man through observation and investigation was able to claim knowledge and truth. The experimental sciences have their origin in the writings of the ancient Greeks. Aristotle wrote on physics, biology, and astronomy.* Archemides developed the lever, Ptolemy, the geocentric theory in astronomy, Democritus, a theory of atoms. But with the fall of Greece experiment in science also declined. The Romans were content with the collection of the researches of their Greek predecessors. And in the Middle Ages, the statements of the ancients, in particular Aristotle, were granted an authority that none could successfully challenge. Peter Ramus was forbidden "on the pain of corporeal punishment" to teach against the doctrine of Aristotle. Bruno, Vanini,

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*To begin with Aristotle is not to claim that he was the first to investigate nature and develop the scientific perspective, for the Presocratics also engaged in scientific enquiries.

and Fontanier all came to "tragic ends". And Roger Bacon, who advocated an experimental basis for science was charged with heresy and imprisoned.[14]

And yet this wave of resistence to blind authority could not be contained, for the new discoveries and theories, which in many cases directly contradicted established belief (i.e., the Copernican system in astronomy) were extending the limits of man's knowledge of nature. For this reason the "new science" succeeded but in its very process, with the generation of knowledge, a redefinition of the nature of truth and knowledge evolved. Truth, for scientists such as da Vinci and later, Galileo, was not conceived of as in nature belonging to a transcendent reality and thus ultimately out of man's grasp but was itself discoverable in the empirical world around us.[15] In other words, man by his own competence, it was believed, could uncover the truth about man and nature for the new truth was no longer to be found in the transcendent realm of universals or eternal essences but was open to man through observation and investigation of the empirical world.

It is E. A. Burtt's[16] conviction that what led to this shift in thought, to a new conception of knowledge and nature, was the growing belief in the mathematical structure of the universe. In asking what reasons Copernicus had for advocating his heliocentric hypothesis, Burtt answers that Copernicus in the face of many objections could only plead "that his conception threw the facts of astronomy into a simpler and more

harmonious.mathematical order".[17] Copernicus' system was simpler than the Ptolemeic system, in replacing its eighty epicycles with only thirty-four, and more harmonious in that the planets could be represented by a fairly regular series of concentric circles around the sun. This new system enabled Copernicus by using simple trigonometry to calculate with great accuracy planetary distances.[18]

Thus for Copernicus mathematics was the key to knowledge, in that truths could be discovered by mathematical calculations. But this basic assumption not only guided Copernicus, but as well Kepler and Galileo, the latter of which is quoted by Burtt.

> Philosophy is written in that great book which ever lies before our eyes - I mean the universe - but we cannot understand it if we do not first learn the language and grasp the symbols, in which it is written. This book is written in the mathematical language, and the symbols are triangles, circles, and other geometrical figures, without whose help it is impossible to comprehend a single word of it; without which one wanders in vain through a dark labyrinth.[19]

Galileo's belief in the validity of a mathematically ordered universe is clearly represented in this passage. The implications of this view, for philosophy, are two. First, the nature of knowledge becomes mathematical and thus obtainable by anyone who is capable of understanding the simplest mathematical demonstration. And secondly, to interpret the world mathematically is to give unto the world a mathematical nature, or structure. And in doing this one necessarily rejects the old view of knowledge as transcendent in nature. Thus acceptance of this new order

necessarily entails rejection of the old.

The consequences of the rise of the 'new science' then, of a science mathematically structured in its interpretation of the empirical world, were not only to make knowledge humanly possible through mathematical investigation and thus redefine knowledge as mathematical, but also, and most crucially, to redefine the nature of the universe itself. And yet, as this new approach to knowledge plunged forth leaving in its wake new discoveries, new facts, upon its coat-tail the new sceptics decried all claims to knowledge. But the sea, it must be remembered, upon which the scientists were navigating, and whose opposition strongly impeded their progress towards the new land, the new order, was the weight, and dominance of Scholasticism.

## 2. The Philosophy of Descartes

What remains to be done, for the balance of this chapter, is to determine Descartes' position with respect to the above picture. Without question, on the testimony of his scientific works, Descartes must be placed on the same side as the scientists fighting against the waves of Scholasticism and the resistance of the new sceptics. Popkin, however, characterizes Descartes as one of the many Saint Georges who rose (in vain) to slay the sceptical dragon and concentrates on the method of doubt as the key to an answer to the new pyrrhonism. This is true, Descartes through his method of doubt, by pushing doubt to its extreme,

does in effect overcome the doubts of the sceptics when after this he establishes his one truth as knowledge beyond all doubt. But the sceptics are not Descartes' main opponent. In the Search after Truth, it is Epistemon, the 'Schoolman' and not Epistemon, the sceptic, which Descartes fashions as the opposition to his spokesman Eudoxus.

With regard to Descartes' own doubts, in the Discourse he writes:

> But because in this case I wished to give myself entirely to the search after Truth, I thought that it was necessary for me to take an apparently opposite course, and to reject as absolutely false everything as to which I could imagine the least ground of doubt, in order to see if afterwards there remained anything in my belief that was entirely certain (HRI, 101).

The doubt with which Descartes begins his quest for certainty is but a method for arriving at the Truth. It is not the possibility of knowledge per se which is doubted, but rather the doubt consists of weeding out all probable knowledge and leaving intact only what is absolutely certain. The doubt then is but a means toward the end of absolute knowledge. And yet, in effect, it is a method of destruction, in one fast, hard stroke Descartes cripples both his enemies - the sceptics and the 'schoolmen'. Thus clearing the way for foundations of his own making.

Popkin sees these foundations originating from Descartes' struggle with scepticism, for he claims that Descartes was not only acquainted with the sceptical literature of the time but that "he was also deeply aware of the crise pyrrhonienne as a living issue"[20] and furthermore,

that Descartes left Paris for Holland to work out in isolation his own solution to the pyrrhonian crisis.[21] It was in Holland that Descartes worked out his foundations for knowledge, or metaphysics: thus, Popkin's argument is this - that Descartes' metaphysics were written as a solution to a sceptical crisis which deeply affected Descartes.

But this suggestion about what led to the writing of the Meditations neglects an important development which greatly influenced Descartes; and that was the rise of the 'new science'. Descartes, like Galileo, Copernicus, and Kepler before him, shared the same conviction with regard to mathematical truths. In the autobiographical section of the Discourse, Descartes informs us that as a student he was "delighted" with Mathematics because of the "certainty of its demonstrations and the evidence of its reasoning". But yet he confesses that at that time he did not understand its true use (HRI, 85). We shall see a little later in this chapter the "true use" of mathematics, what concerns us here is his "delight" for mathematics. It is highly improbable that Descartes ever became disillusioned with, or doubtful of the certainty of mathematical demonstration. Even in the radical doubt of the Meditations wherein he appears to question the validity of mathematics (HRI, 147), it is not mathematical certainty which is in question, two and three always make five. What is in question is whether a deceptive God exists and allows us to think these truths as firm when they are not. Popkin, himself, admits that Descartes never doubted the certainty of

mathematical knowledge. With regard to the same passage in the Meditations, Popkin writes:

> It is not that Descartes was denying or doubting the self-evidence of our mathematical or most certain knowledge, but rather he was showing that as long as we might be demonically infected, what appeared self-evident to us might be false.[22]

Thus Descartes never came to a "crise pyrrhonienne" with regard to mathematical certainty, nor did he ever come to doubt the nature of truth. In a letter to Mersenne, 16, October, 1639, Descartes writes with regard to Lord Herbert's De Veritate:

> In the general plan of the book the author takes a route very different from the one I have followed. He examines what truth is, I have never thought of doing so, because it seems a notion so transcendentally clear that nobody can be ignorant of it. There are many ways of examining a balance before using it, but there is no way to learn what truth is, if one does not know its nature.

It can be seen here that not only the certainty of mathematical demonstration but the very nature of truth itself were beyond suspicion for Descartes. Thus his metaphysics cannot be the result of a search for truth, of an attempt to discover its nature, but rather, I shall suggest, Descartes' metaphysical foundations for knowledge were necessary as a justification for the knowledge Descartes obtained once he had discovered the "true use" of the mathematical mode of investigation. Of course, Descartes does formulate his philosophy within the context of a "search for truth" but this search is not conducted without

an a priori method. In the Discourse, Part II, after presenting the four rules of his method, Descartes states:

> Those long chains of reasoning, simple and easy as they are, of which geometricians make use in order to arrive at the most difficult demonstrations, had caused me to imagine that all those things which fell under the cognizance of man might very likely be mutually related in the same fashion; and that, provided only that we abstain from receiving anything as true which is not so, and always retain the order which is necessary in order to deduce the one conclusion from the other, there can be nothing so remote that we cannot reach to it; nor so recondite that we cannot discover it (HRI, 92).

As long as his method is adhered to, Descartes feels that all things which man is capable of knowing, that all knowledge can be discovered by the strict use of his method. And this is the true use of the mathematical mode of reasoning, for it is the essence of Descartes' method, and as such it is extended not simply to mathematical problems, but to Geometry, Algebra, Physics, to all that man can know. Thus all knowledge has as its foundations one and the same method. Copernicus and Kepler had made use of the mathematical method in astronomy, Galileo marvelled at the manner in which natural happenings followed the principles of geometry. But Descartes' objective was to take the mathematical method, modify it (HRI, 91-92), and apply it to all the sciences, to all knowledge.

But one may wonder why, if Descartes was so certain of his method, he felt it necessary to ground his theory of knowledge in a metaphysics. He explains:

> But what pleased me most in this method was that I was certain by its means of exercising my reason in all things, if not perfectly, at least as well as was in my power ... and not having restricted this method to any particular matter, I promised myself to apply it as usefully to the difficulties of other sciences as I had done to those of Algebra ... But having noticed that the knowledge of these difficulties must be dependent on principles derived from Philosophy in which I yet found nothing to be certain, I thought that it was requisite above all to try to establish certainty in it (HRI, 94).

The explanation which Descartes provides in this passage from the Discourse is vague and it must remain so for a little while longer. What is important at this point is the belief that order must be restored to the discipline of Philosophy before knowledge in the sciences can proceed. Thus, the motivation for Descartes' metaphysical foundations of knowledge is not found in a reaction to the "crise pyrrhonienne" but in a perceived connection between knowledge in science and in philosophy. The question of what this connection is is the stimulus for the material presented in the coming chapter.

## 3. Concluding Argument

In light of the intellectual atmosphere which surrounded Descartes, I have proposed, although the details of the connection have yet to be presented, that it was science and mathematical order which most influenced the thought of Descartes, in particular his metaphysical principles, and not scepticism. Thus the question which still remains is why Descartes felt it necessary to ground certainty in the sciences on principles of

philosophy. However, before an answer can be proposed, a number of concepts must be fully analyzed. These are "knowledge", since we are dealing with a connection between two modes of knowing, "Method", the means of acquiring knowledge, and "reason", the heart of the Method. Once these concepts are fully grasped, the question of the relationship between metaphysics and physics can be intelligently discussed. Let us begin with "knowledge".

## Chapter II

## THE RATIONAL FOUNDATIONS OF DESCARTES' THOUGHT

### 1. Knowledge

There is only one kind of knowledge that Descartes seeks and that is "perfect knowledge". Probable knowledge or knowledge which is suspect must be rejected. We must "trust only what is completely known and incapable of being doubted" (HRI, 3). But how is it that we come to doubt what we know? Do I not know that there is a book in front of me, that I am sitting in a room, at a desk, etc. ? A student of the Meditations, in answer will quickly produce such statements as:

> At the same time I must remember that I am a man, and that consequently I am in the habit of sleeping ... How often has it happened to me that in the night I dreamt that I found myself in this particular place, that I was dressed and seated near the fire, whilst in reality I was lying undressed in bed! (HRI, 145-146)

Thus, while I may be aware of something, it seems that unless I am aware of the basis or cause of my awareness, what I believe to know may in fact be false. Unless I can show that I am not dreaming that what I am aware of is not internally caused and thus not an illusion I cannot claim to have "knowledge", in Descartes' sense of the term,

for knowledge, or perfect knowledge, the only kind permissible according to Descartes, requires awareness of, in the language of the Principles, its "first causes or Principles" (HRI, 204). If I am aware of the principles upon which my knowledge rests, if I know the cause of my awareness, then such knowledge is perfect for no doubt can be raised with regard to it.

Let us expand on this. If my interest is in scientific knowledge then to be certain of this knowledge I must become aware of its basis, the cause or principles upon which it is grounded. The discipline which is concerned with such principles Descartes entitles "metaphysics" (HRI, 211) and the study of this is "philosophy" (HRI, 204). Here the term "philosophy" is used in a narrow sense.[1] Thus scientific knowledge for Descartes must seek its foundations in philosophy or metaphysics, for only in this way can one establish its first principles.

And yet, following Descartes, science itself is to be broken down into four separate sciences; physics, medicine, mechanics, and morals. And here again as with metaphysics and science in general there is an inter-connection. Physics which is the study of the nature and composition of material objects, or of the physical world, contains the foundations of the latter disciplines, in so much as these have their basis in the nature of physical objects. Thus not only is science dependent on philosophy for its certainty but the various sciences are themselves inter-connected and inter-dependent. Hence, Descartes tells

us that "philosophy as a whole is like a tree whose roots are metaphysics, whose trunk is physics, and whose branches, which issue from this trunk, are all the other sciences" (HRI, 211). "Philosophy" used here in a wider sense than that above indicates that all knowledge is an interrelated and unified system. Thus knowledge itself is one.

This is the conclusion which Descartes' concept of knowledge leads us to. Scientific knowledge, or simply, knowledge, since this is the only mode of knowing which Descartes places any value in, is one unified system. There is then a unity or uniting principle in all our knowledge. But what, one may ask, is the basis of this unity? What gives to the "tree" of knowledge its shape and life? To answer this question we must uncover the importance which the study of science has for Descartes. But first we must see what "science" is and this not in terms of its object but in terms of its form as a mode of knowledge.

The explanation to Rule 1 provides us with a distinction between the arts and the sciences. The arts which "depend upon an exercise and disposition of the body" are for Descartes bodily skills which can only be mastered singly. Science, on the other hand, "entirely consists in the cognitive exercise of the mind". Scientific thought then is an intellectual endeavor. In its entirety science is "true and evident cognition" (HRI, 3). To get closer to Descartes' meaning let us

consider the following passage, for here we will find an indication of what science consists of.

> Neither, though we have mastered all the arguments of Plato and Aristotle, if yet we have not the capacity for passing a solid judgement on these matters, shall we become Philosophers; we should have acquired the knowledge not of a science, but of history (HRI, 6).

If we cannot pass "solid judgements" on the works of philosophers, we have no claim to the title of philosopher, and unless we can judge soundly we have not acquired knowledge of a "science". Thus scientific knowledge consists of nothing but the ability to pass sound judgements.* And judgement being an exercise of the mind, we can see that science in so far as it is an exercise of the ability to pass sound judgements is in this respect a function of the mind.

Since the ability to pass sound judgements is required for knowledge to be scientific all the sciences must be the same or identical in that they are all an exercise in sound judgement. Thus another way in which all knowledge is one emerges and that is that all knowledge consists of the ability to pass sound judgements. And in this the value of science is to be found, for the expressed intention or purpose of all

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*It should be noted that Descartes' theory of judgement in the Rules is not identical with his theory in the Meditations. The crucial difference being that the will is not clearly defined as a separate faculty in the Rules, whereas, in the latter work the will is so defined.

study, as declared in Rule 1, is "to direct the mind towards the enunciation of sound and correct judgements on all matters that come before it"; thus, scientific endeavor as an exercise of this ability is suitable training. But this foundation in the mind not only provides the value criteria of science but also gives us a clue as to why all knowledge is unified and that is that this unification, in some way yet undisclosed, may also be due to the fact that science is an exercise of the mind.

We have seen then that not only is knowledge unified as one inter-connected system, but that also in nature, as sound judgement, it is one and the same regardless of the different objects of each scientific discipline. In nature, scientific knowledge is "clear and evident cognition"; it is an exercise in sound judgement. But how is this so? To fully understand Descartes' concept of knowledge we must unravel Descartes' Method as presented in the Rules, for herein a full account of both its nature and acquisition is given to us.

## 2. Method

We have witnessed two characteristics of knowledge. Let us now consider a third:

> we must not fancy that one kind of knowledge is more obscure than another, since all knowledge is of the same nature throughout, and consists solely of combining what is self-evident (HRI, 47).

Thus knowledge is not simply clear and evident cognition. it is

also the "combining" of what is evident. To understand Descartes' concept of knowledge then we must first come to grips with what "clear and evident cognition" is, and secondly, what this "combining" consists of. But let us not forget that knowledge is also an expression of our ability to make sound judgements. We must determine also then the relation between this ability and the process of combining the self-evident. *

Our chronological starting point then is that all knowledge is of the same nature. What this allows us, or Descartes, to claim is that only one Method is necessary for the acquisition of all knowledge. If the nature of knowledge was determined by its objects and thus consisted of, as many natures, as disciplines or modes of knowing then clearly no one method would account for all knowledge. But Descartes is confident that this is not the case; thus, he prescribes one method, one manner of acquiring knowledge. Although we do not as yet know why all knowledge must be of the same nature, let us concede to Descartes that one method will suffice. And, let us postpone for the present one further question and that is why this method and no other

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*Most commentators on Descartes' Method stress this latter aspect of knowledge. However, I have yet to find a satisfactory account of the relation between judgement and reason as presented in the Rules. Although, L.J. Beck, The Method of Descartes (Oxford 1952), 18 does go so far as to distinguish between judgement in the Rules and the doctrine of judgement in the later works.

will do.

But before we examine Descartes' Method let us consolidate our present position. In accepting Descartes' formulation of knowledge we have unwittingly slipped into the Cartesian mode of thought. We have become "mentally" (i.e., mind) oriented, we have left aside the content or matter, the concrete facts which comprise one's knowledge and have focused purely on the form, shape, or perspective that knowledge has when viewed solely from the thinking mind. Let us continue in this path until we have completed the cognitive aspects of knowledge, then we will turn to Descartes' discussion of the "objects" of knowledge.

'Tis better to follow a method in our search for truth then to "roam the streets" blindly with only luck and chance as our guide. So suggests Rule IV. 'Tis better to follow "certain and simple rules" than to "walk in darkness". So Descartes seeks to persuade us to take with us as our guide his Method. Let us agree that by following certain, simple rules our quest for knowledge will be more advanced than a quest conducted without guidelines. But before these rules are unfolded let us set the stage.

> In the subjects we propose to investigate, our inquiries should be directed, not to what others have thought, nor to what we ourselves conjecture, but to what we can clearly and perspicuously behold and with certainty deduce; for knowledge is not won in any other way (HRI, 5).

We should not absorb ourselves too deeply in the "writings of the ancients" for in blindly accepting all that they pronounce we may come to accept their errors as well as their truths. We should never trust "doubtful opinions" regardless of authoritarian weight, nor conjecture or hazard guesses but only what we can clearly recognize as certain and with certainty deduced. This advice (Rule III) agrees with what Descartes outlines in Rule II and that is to reject all "probable knowledge" and accept only that which is indubitable.

But who is this advice given to? Is it not to all of us singly? 'I' should trust only what 'I' can clearly recognize and deduce with certainty. It is the 'I', each single individual subject which must discriminate the indubitable from the probable and deduce from this only what is certain. But here an obvious problem arises. Is it not possible that two minds, two persons, may each clearly and perspicuously conceive two entirely opposite things as true?

This would be a serious problem for Descartes if it was not for the uniformity which his one Method gives to all thought. If we all follow the Method, if we all reason in the same manner, i.e., using the mathematic model, then all our thoughts, guided by the same procedure will result in a uniformity of knowledge. And if a discrepancy occurs then the source of error would be traced to, or accounted for by, a mistake in the application of the Method. Granting this, the rules or Method are what each of us must follow simply in our search for

knowledge. And since we must rely on our own cognition, each of us must do our own work. None can discover and deduce the truth for another.*

Truth, then, is subjective and is manifest in clear and evident cognition. But awareness of the truth can either be immediate or mediated. Immediate awareness, to use Descartes' own technical term, is labelled "intuition" and mediated recognition "deduction".

> By intuition I understand, not the fluctuating testimony of the senses, nor the misleading judgement that proceeds from the blundering construction of imagination, but the conception which an unclouded and attentive mind gives us so readily and distinctly that we are wholly freed from doubt about that which we understand. Or, what comes to the same thing, intuition is the undoubting conception of an unclouded and attentive mind, and springs from the light of reason alone (HRI, 7).

In this definition no reference is made to the objects of intuition, or to what is immediately grasped in an intuition, rather, Descartes outlines the characteristics of an intuition. Beck, in The Method of Descartes, in his analysis of intuition divides these characteristics into two kinds - psychological, which characterize the source of intuition, and epistemological or logical, which outlines the nature of

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*This may be qualified somewhat in that truths which others have discovered can be incorporated as one's own. But this only on the condition that these present themselves as clear and evident.

the act (i.e., simplicity).[2] An intuition is an indubitable "conception"* of the mind, or more precisely, of the understanding, rather than a sensation or product of the imagination. But it is of a mind which is "unclouded and attentive" and is itself presented readily, or immediately, and distinctly. An intuition is a "seeing" or recognition which is so evident, thus so free from doubt that we cannot but affirm it as true. Examples of this immediate grasping of a truth are provided by Descartes; for instance, one can clearly recognize, immediately intuit that he exists or that he thinks. These facts are so clear, so evident, so immediately recognizable as true that their truth is beyond doubt.

If there is one acute problem in the above definition, it lies in Descartes' reformulation of an intuition as a conception which "springs from the light of reason alone". This phrase, "the light of reason" or as Descartes refers to it in his later writings, "the natural light of reason" does have an historical ancestry. John Morris, "Descartes' Natural Light",[3] traces two possible sources for this term, the first being more likely to have influenced Descartes than the second. The most likely source of this term, Morris believes, is the works of St. Thomas Aquinas, in which the "light of the agent intellect" is that which

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*In the Rules the term "conception" lacks clear meaning. The closest we come to an explanation is in Rule XII (HRI, 39), wherein it is characterized as an "impression" of the mind.

enables us to abstract intelligible conceptions from images derived from sensible objects. Here the natural light would be the active agent in this process. Another function which Aquinas assigns to the natural light, and which may serve as an indication of Descartes' use of the term, is that it is the source, or agent, which gives to man knowledge of first principles. We can see some possible assimilation here in that for Descartes intuition, as the above quotation suggests, "springs" from the light of reason and, as we shall see shortly, intuition does provide Descartes with first principles, not only of deduction but within his metaphysics of his first metaphysical principle. The other possible source, in which Morris sees no indication of influence on Descartes, is the Ockhamist tradition, in particular Pierre d'Ailly, which relies on the natural light as the source of indubitable axioms (i.e., the principle of contradiction).

But what is important for the purposes of this paper is to get clear on the meaning of this term as used in the above passage.

In general, outside of Morris' article, this notion has received scant attention. Peter A. Schouls, "An Incapacitating Presupposition of Rationalism", while noting the importance of this term characterizes the natural light vaguely as the "something" which "sees" or "grasps" the truth.[4] Beck, in his brief treatment, of the natural light equates it with the "natural power of discerning or discriminating the true from the false".[5] For Beck, the natural light is synonymous with "human

wisdom" and "good sense" in that all of these terms are used to express the natural power of discerning the truth. Norman Kemp Smith, wrongly, according to Morris, equates the natural light of reason with cognitive awareness or man's cognitive ability. Descartes, Kemp Smith feels, is committed to the:

> far reaching conclusion that sense, imagination, memory, and understanding are not really separate cognitive faculties, but merely alternative titles given to the "natural light of reason".....
>
> This equating of cognitive awareness with the natural light of reason, consistently held to by Descartes in all his writings.....[6]

Kemp Smith is correct in his claim that sense, imagination, memory, and understanding are not separate faculties, but, whether these are to be regarded as alternative titles for the natural light is another question. For if intuition springs from the light of reason alone and not from the testimony of the senses or constructs of the imagination, then clearly the "natural light of reason" cannot be an alternative title for all that Smith claims.

Morris' own formulation of the natural light hinges on the distinction between active mind and passive mind, between will and understanding. It is active mind which brings ideas into consciousness, and passive mind, or understanding which gives recognition to ideas as true. The natural light for Morris is a function of the understanding only in that "it does not form ideas, or bring them into consciousness.

Instead it simply gives a click of recognition when a true idea is brought before it". In other words, the natural light is that which causes one to recognize that something is true.

Now, let us see if any of these formulations will help us to understand the use of the "light of reason" in relation to intuition, leaving aside the difficult problem of attempting to resolve any consistency or lack of such in Descartes' use of the term throughout his works. We can see immediately that Beck is of no help here, for in intuition no discerning or judgement about what is true occurs, all that happens is the simple immediate recognition of something as so clear and evident that no doubt can be raised; hence, no discernment or judgement is necessary. We can also see that however valid Morris' formulation is in the latter works, which is the obvious* and expressed source of Morris' analysis, it is of no value here, for intuition gives to us a clear concept which "springs" from the light of reason. Thus the light of reason must itself be the ground of intuitive awareness and not simply a shutter which clicks yes or no when ideas are presented. And in so far as intuition is a form of cognitive awareness it must have its source in one of the faculties of cognitive awareness - sense, imagination, memory, or understanding. We cannot make Smith's mistake, for Descartes

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*Obvious in that the active-passive distinction used by Morris is clearly based on the separation of will and understanding in the Meditations.

does reject sensation and imagination explicitly and memory implicitly in that intuition is immediate apprehension. Thus if the light of reason refers to the source of cognition in intuition the only possibility left is the understanding. Thus the light of reason then refers simply to the faculty of understanding as the source of intuitive awareness. In other words, when I have an intuition, that intuitive awareness which I have is not awareness of something sensed, or imagined but awareness of something triggered by the light of reason, by pure understanding.

But one must be careful with the term 'faculty'; for although Descartes himself uses it (HRI, 35) we must heed not only Smith's warning but Descartes' own (HRI, 39) that the mind does not consist of separate faculties. Descartes does maintain that the "cognitive power" is one and the same whether it is referred to as pure understanding, imagination, sense, or memory. The only difference is in the object of cognition. In imagination cognition is of impressions of the imagination, in sensation of impressions from sensible objects, and in understanding cognition is of impressions of the mind alone, when it acts alone.* Thus, my proposal must be further modified, an intuition stems from a particular mode of knowing, a particular form of cognition which is called "pure understanding" or the light of reason.

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*The concept of mind acting alone, should become clearer as I proceed with my analysis of deduction and reason itself.

Intuition, then, is rooted in the understanding, in the mode of knowing in which mind acts alone. To have an intuition is to have an immediate conception or impression of something as self-evidently true. Deduction, in contrast to the immediate apprehension of intuition involves "a certain movement or succession" (HRI, 8). For instance, one may not immediately apprehend that 23 + 21 = 27 + 17. * To comprehend this we must first intuit that 23 + 21 = 44 and then that 27 + 17 = 44. Thus to see that 23 + 21 = 27 + 17 requires beyond simple intuition the further operation or recognition that the last statement is the necessary conclusion of the two preceding ones. This further operation is coined "deduction" by Descartes and as can be seen involves "a movement from facts to conclusion". Thus deduction is understood as "all necessary inference from other facts that are known with certainty" (HRI, 8).

Intuition is validated by the immediacy and distinctness of the conception, deduction, on the other hand, because it involves a certain succession of facts cannot be validated by the same criterion. Its conclusions, though, can be certain if the principle or facts upon which it is built are true. Deduction, Descartes tells us, "cannot by us be erroneously conducted" (HRI, 7). But this is true only under one

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*To use an example which is not so clearly evident as 2 + 2 = 3 + 1. This being Descartes' own example in Rule III.

condition - "when performed by an understanding that is in the least degree rational" (IIRI, 5). If our inferences are conducted by a rational understanding, and what this means at this point is unclear, then we cannot err. Our mistakes then are not due to faulty inference but are caused when poor foundations, or "hasty propositions" are taken as the basis of our inferences. To the extent that our first or grounding principles are true, the conclusions we draw from these must also be true. Thus, deduction grounded on intuition must yield certain knowledge.

Intuition then, can be characterized as the spontaneous recognition of something as true and deduction as the process of construction, from intuited facts, of conclusions which are certain but not self-evident or immediately intuitive. However, it may be added here that once a conclusion is reached via deduction it is possible to apprehend the process and conclusion in one simple intuition.* For instance, once I have deduced that $23 + 21 = 27 + 17$ from the separate intuition: $23 + 21 = 44$, $27 + 17 = 44$ if I go back and repeat this process again and again I will come to an immediate grasp of its truth and the process which led to it (IIRI, 19). Thus the same facts may be known

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*It is necessary though to restrict this possibility to conclusions not involving a long complex series of inferences. For clearly, although Descartes outlines a procedure for strengthening the mind's capabilities, in particular memory (Rule VII), there is an upper limit to its ability to retain facts.

both by intuition and deduction.

Although Descartes repeatedly states that intuition and deduction are the only "certain routes to knowledge" one must not be drawn to the conclusion that these are two mutually exclusive methods. For not only are these aspects of one process in that intuition provides the first principles for deduction, it must also be recognized that deduction itself is in more than one sense but a series of intuitions. Once I have deduced from the series A = B, B = C, C = D, D = E, the conclusion A = E in consistently repeating the entire process of inferences I come to an intuitive grasp of the series of steps. Thus the whole series of inferences comes to be an intuition, that is we come to an intuitive grasp of the whole series.

But in another sense, in the actual deduction itself intuition has a role to play. To infer that A = B is to have an immediate grasp of the relation between A and B. Although a number of prior steps may have been necessary before the recognition of the relation between A and B occurs, this relation when grasped is itself presented so self-evidently and immediately that its truth is beyond doubt. Thus each inference, in this case A = B, must itself be intuitively grasped. And in this manner, in the very process of deduction intuition plays a key role.[8]

Thus it can be argued that deduction is no more than an extension of intuition, or a series of intuitions. And since intuition is itself

a "seeing", or immediate awareness of a fact, one may be drawn, as Kemp Smith is,[9] to the conclusion that all our knowing is not a "making" but only a "seeing". And as long as deduction is viewed simply as a series of intuitions which accumulate in one final complex intuition of the series itself, this conclusion is valid.

But it must be noted that deduction itself involves a progression from what is self-evident in intuition to a conclusion that was not immediately self-evident. Thus deduction and deductive knowledge not-only involves a "seeing" or immediate cognition of a first principle and possibly of each step in the process but along with this there is a construction, step by step, of knowledge not previously apprehended from intuitable facts. Thus knowing, for Descartes, is not simply a "seeing" but also a "making", a building up of new facts, or conclusions, from previously intuited facts. This "building up" will become even clearer in the coming discussion of the "objects" of knowledge.

Let us stop this exposition of the acquisition of knowledge for a moment and tie together a number of important points. At the beginning of this section "knowledge" was characterized as self-evident cognition and consisted of the combining of the self-evident. We can now understand a little more fully what Descartes means by this. Self-evident cognition is nothing other than intuition and the combining of the self-evident, the inferential process of deduction. Thus knowledge is nothing more than intuition and deduction. This not only expresses the way

by which knowledge is won but, as we shall see, contains an indication of the very nature of knowledge itself.

Knowledge, to recapitulate, is won by a single process which consists of the combination of the operations known as intuition and deduction. But although these operations constitute the nucleus of Descartes' Method, they are not performed in isolation.

> Method consists entirely in the order and disposition of the objects toward which our mental vision must be directed if we would find out any truth. We shall comply with it exactly if we reduce involved and obscure propositions step by step to those that are simpler, and then starting with intuitive apprehension of all those that are absolutely simple, attempt to ascend to the knowledge of all others by precisely similar steps (HRI, 14).

This passage, and an important one indeed, contains two statements. The first concerns the "objects" of knowledge, and the second, the procedure to be followed in ascending to the truth. Since we have yet to discuss the objects of knowledge, this first point must be bypassed for the moment. However, so as not to lose its significance, it must be kept in mind that the procedure which follows in some way, yet unclear, is connected with the order and disposition of these objects. Now, what is this procedure? It is, first, to separate the simple from the complex and then starting with an intuitive grasp of the "absolutely simple", deduce or "ascend", by intuitive grasp of inter-connections, to knowledge of the complex.

This procedure contains an essential premise which holds for

Descartes' entire theory of knowledge and that is that all knowledge conforms to a defined order, or certain series. This is essential not only for an understanding of the method but also, to briefly mention an old problem, it is essential in understanding why principles of physics are conceived of as dependent upon principles of metaphysics. Both of these are predicated on the belief that knowledge is structured, that there is a natural order from simple to complex in all our knowing.

Besides this presupposition, the above passage also reveals the method by which this order, or series, is constructed. The first operation requires an analysis or reduction of the complex, or involved and obscure, into its simpler components, which are intuitively grasped. The second consists of a reconstruction, or deduction, of the complex, from the simple. The relation or connection between the simple and the complex is disclosed in Descartes' discussion of the absolute and relative.

> we must note first that for the purposes of our procedure, which does not regard things as isolated realities, but compares them with one another in order to discover the dependence in knowledge of one upon the other, all things can be said to be either absolute or relative (HRI, 15).

In the breakdown of the obscure into its constituent parts all "things (left vaguely as any fact, proposition, etc.) are to be classified as either "absolute" or "relative". But these "things", it must be noted, are not to be regarded as isolated realities, that is each thing is not to

be considered as a single autonomous whole but is to be conceived of as in some way dependent. The necessity of this assumption is clear. If all our "bits" of knowledge are to be conceived of as autonomous in nature then obviously there would be no grounds for asserting a connection between these, as Descartes must if in deduction we are to join facts together. However, the nature of this connection, unfortunately, is left obscure by Descartes as are the terms "absolute" and "relative".

> I will call that absolute which contains within itself the pure and simple essence of which we are in quest (HRI, 15).

In order to understand this definition we must first satisfy ourselves as to our quest. In general, our quest is for knowledge; thus, the absolute would be that which contains in itself the essence of knowledge. However, this suggestion confuses rather than clarifies. To try again. In what is commonly referred to as the second part of the Rules (Rule XXIII through Rule XIV) Descartes offers us examples of his method in use. These examples are formulated in terms of "questions" or problems to be solved. From this perspective, the absolute would be that proposition which contains the essence or key to the solution of our problem. This is helpful, for Descartes in Rule VI does state that the absolute is the "simplest and easiest" term or proposition which "we can make use of ... in the solution of questions" (HRI, 15).

This characterization falls short as a definition, that is it does not tell us what the absolute is, rather, it tells us how to recognize it in any given series. And to help us in this recognition, Descartes provides some examples; "the term will be applicable to whatever is considered as being independent, or a cause, or simple, universal, one, equal, like, straight, and so forth " (HRI, 15). Needless to say, one wishes a clearer formulation than that which is offered by Descartes. But perhaps the closest that one can come to understand the absolute is by conceiving it as the ultimate ground, or first proposition in any given series, the proposition from which all others follow. And those which follow, which in some way depend on or are related to the absolute, Descartes terms "relative". But again, instead of clarification of this term we are given examples of what it is supposedly applied to (HRI, 16).

Many questions remain. Primary among these are the matters of the nature of the absolute and relative and the grounds of dependency. Descartes does tell us that they are of the same nature and that it is this participation in this nature which enables one to relate the absolute to the relative (HRI, 15). But again, what is this nature and in what sense does the relative share in the same nature as the absolute? But on the positive side what emerges is a distinction which provides the basis for distinguishing the simple from the complex. The order of method is from the simple to the complex. But how does one recognize

the simple, or the "absolute simple" which is to serve as the foundation for reconstruction? Descartes' answer appears to be that after we have analyzed the complex, reduced it to its simple terms we then examine all these terms and distinguish them according to their relativity. The absolutely simple, which starts our ascent to knowledge, then, would be the absolute term, the one that contains the key to the solution of our difficulty.

Perhaps, to clear away lingering clouds, an illustration of the formal aspects of knowledge, of its acquisition and consequently its construction is in order. Since Descartes formulates his own illustrations in the context of problems to be solved, let us also follow this procedure, for it will illustrate both how knowledge is acquired and its logical structure.

| | |
|---|---|
| Problem: | Given D, A, C, E, B; discover the order of succession between A and E. |
| Step I: | Reduce the complex, the order of succession between A and E, into its simpler components. |
| Result: | D/A/C/E/B |
| Step II: | Distinguish the absolute from the relative and list according to relativity of each item. |
| Result: | A/B/C/D/E |
| Step III: | With an intuitive grasp of the simplest relation (AB) construct or deduce the order of succession. |
| Result: | AB/BC/CD/DE. Therefore A, B, C, D, E. |

This example shows clearly how knowledge is acquired. Analysis of relevant information (Step I) is followed by the arranging of items in

relational sequence, from absolute to relative (Step II). These preliminary steps break the complex into simpler relations and thus enable one by intuitive grasp of the simplest relation (AB) to ascend to knowledge of the most complex (Step III). Thus knowledge is acquired through analysis and orderly construction. The whole process can be likened to the putting together of a jigsaw. First, all the pieces are laid out and each studied individually. Then starting with one basic piece one begins by connecting to it its closest neighbor, and this in turn is connected with its closest neighbor, and so on until the jigsaw is complete. Thus, knowledge, in its formal aspect, is nothing other than the putting together of bits of information. * And Method is that process by which we do the putting together. But let us recall the first point made by Descartes in Rule V, that the procedure we have just outlined is itself predicated on the order and disposition of its objects. Let us clarify this point.

The exposition to Rule XII begins with the following fundamental distinction:

> In the matter of the cognition of facts two things alone have to be considered, ourselves who know and the objects themselves which are to be known (IIRI, 35)

In the treating of knowledge two things alone have to be considered

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*I leave this ambiguous. The coming discussion of simple natures will enlarge and clarify this "putting together".

we who know, the subject which is aware, and the objects known, that which the subject is aware of. Let us leave the first part for discussion at a later point and turn directly to the "objects" to be known. But here Descartes does not give us what one would expect, for his first comments make it clear that he is not using "objects" in the ordinary sense of the term.

> we assert that relatively to our knowledge single things should be taken in an order different from that in which we should regard them when considered in their more real nature (HRI, 40).

In this passage I take "single things" as a reference to objects in nature (i.e., trees, books, etc.) and these Descartes maintains, from the perspective of knowledge, true cognition, should be regarded in a different light than that of their more "real nature". To illustrate the difference Descartes uses the following example. If we consider a body as having extension and figure, from the point of view of the thing itself, this body is not regarded as a thing composed of two distinct qualities - extension and figure. But relative to our understanding it is so conceived. Relative to our understanding a body is a composite of distinct natures - corporeal nature,* extension, and figure. And it is in this latter manner, in our conception, or awareness, of objects as

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*This is the only reference to "corporeity" as a simple nature. In his enumeration of simple natures pertaining to the purely material (HRI, 41), Descartes lists the following natures - extension, figure, motion.

a composite of simple natures that the "objects" of knowledge are to be considered. But notice here that the notion of a thing in nature as distinct from our awareness of it disappears. For in true cognition only two factors are to be considered - the awareness or cognition of the subject and that which he is aware of and this in terms of "objects" is something composed of simple natures. The subject is only aware of objects as such, thus no object can be conceived otherwise.

Let us now focus on the simples which comprise the object as we are aware of it.

> Hence here we shall treat of things only in relation to our understanding's awareness of them, and shall call those only simple, the cognition of which is so clear and so distinct that they cannot be analysed by the mind into others more distinctly known (HRI, 40-41).

The above definition of the simple rests on Descartes' notion of the "distinct" and this needs clarification. From the Principles, Part I, XLV (HRI, 237): the distinct is that which is "precise and different from all other objects". Thus the simple is that which is so distinguishable from all other things that it cannot be reduced to or confused with any other thing. Thus, to label extension, figure, and motion as simples common to matter is to consider these as distinct and irreducible.

But what are these simples? Descartes offers no analysis or description, but as with the absolute and relative he provides a list of examples. Simples are classified as either purely intellectual, purely material, and those common to both. They are the basic constituents

of knowledge in that its objects are compositions of these. But are simples only constituents of knowledge, are they merely, if at all, conceptual identities, i.e., notions of the mind? Brian E. O'Neil, in his article "Cartesian Simple Natures",[10] presents an argument for "epistemological direct realism" in the Rules. The major premise of his argument is that at least some simple natures, those pertaining to material things, are not merely conceptual but actual constituent elements of the physical world. This is an important point and should be examined closely.

The suggestion that some simple natures are not mere ideas is rooted in Descartes' enumeration of the simples. First, the purely intellectual natures:

> Those are purely intellectual which our understanding apprehends by means of a certain inborn light, and without the aid of any corporeal image. That a number of such things exist is certain, and it is impossible to construct any corporeal idea which shall represent to us what the act of knowing is, what doubt is, what ignorance, and likewise what the action of the will is ... and so with other things (HRI, 41).

As O'Neil points out, "Descartes is not just speaking here of ideas, he is speaking of the act of knowing, doubt, ignorance, will as things which exist." However, O'Neil's concern is with the accepting of such candidates as these as "parts of the world". And yet, since mental substance, or mind, is clearly a part of Descartes' world, and indeed a necessary one, these natures are more than ideas pertaining

to mental substance. They are for Descartes constituent elements of the mental substance, mind.

> What is a thing which thinks? It is a thing which doubts, understands, conceives , affirms, denies, wills, refuses, which also imagines and feels (HRI, 153).

With regard to material simples, Descartes states:

> Those things are purely material which we discern only in bodies; eg. figure, extension, motion, etc. (HRI, 41).

The key here is "discern only in bodies"; material natures are not discerned about bodies, but in bodies. Descartes' analysis of extension in Rule XIV confirms this point:

> My conception is entirely the same if I say extension occupies place, as when I say that that which is extended occupies place.
>
> Let us now take up these words: body possesses extension. Here the meaning of extension is not identical with that of body, yet we do not construct two distinct ideas in our imagination, one of body, the other of extension, but merely a single image of extended body (HRI, 58).

There is no difference between the conception, mind's awareness, of an extended thing, or object, occupying a place and of extension occupying place. Extension and extended things are one and the same, to have an idea of extension is to conceive an extended thing.[12] And again, when one says body possesses extension one does not form two ideas - body and extension in the imagination and then put them together but forms one idea - extended body. This would suggest that material

natures (extending the above analysis to figure and motion) are not something distinct from the material.

To add one further argument, let us consider Descartes' answer to the question what is the nature of the magnet.

> But he who reflects that there can be nothing to know in the magnet which does not consist of certain simple natures evident in themselves, will have no doubt how to proceed. He will first collect all the observations with which experience can supply him about this stone, and from these he will next try to deduce the character of that inter-mixture of simple natures which is necessary to produce all those effects which he has seen to take place in connection with the magnet (HRI, 47).

Assuming that in material objects, an assumption which stands in need of justification, there is nothing knowable in them other than simple natures and their inter-mixture, what is required is to deduce the inter-mixture of simples which produce the observed effects of the magnet. But if these simples are mere ideas and not constituents of the material object then how can their inter-mixture account for actual effects which we witness in connection with the magnet. Can ideas in our head make magnets behave the way they do.

The above arguments, although reformulated in my own terms, are derived from O'Neil's paper. Much more textual evidence could be provided to make the point. But it has been sufficiently made. Simple natures are not merely constructs of the mind that knows, although this may be the case with the common natures, but do constitute

elements of real things. In so far as mind and body are natural existents, the simples which pertain to these are real elements of the natural world and not simply elementary components of our knowledge of the natural world. Simples to be precise are both elements of knowledge since we deduce conclusions on the basis of our awareness of these and constituent elements of natural objects in that they are in conception inseparable from natural objects, this is particularly so with regard to material simples. Thus one can further see that the order of knowledge is the order of things for Descartes. Our awareness of objects as composed of simples is awareness of objects in their true nature.

The "objects" of knowledge, then, are the simples and these, Descartes maintains, are known per se, or intuitively (HRI, 14, 42), that is simple natures are what we intuit when we have an intuition. And it is their inter-mixture which we infer in our deductions. For:

> no knowledge is at any time possible of anything beyond those simple natures and what may be called their intermixture and combination with each other (HRI, 43).

With this, at last, we can begin to put an end to all our enquiries regarding Descartes' concept of knowledge. For instance, if I want to know the nature of the magnet, I can achieve this knowledge by first observing the effects of this stone and then via deduction infer the particular relations between, or intermixture of, its simple natures.

All knowledge is self-evident cognition. All knowledge is intuitive, or intuition of simple natures. But it is also the combining of the self-evident; it is the putting together of bits of information, or the deduction of the relationship between simple natures. And all knowledge is won by the same Method; by the analysis of the complex and obscure into its simpler elements, or simple natures, and by reconstruction via deduction, in which the inter-mixtures or connection between simple natures is clearly grasped; thus enabling us to comprehend the complex unclothed of its former obscurity.

But this procedure of analysis and synthesis, to recall Rule V is predicated on the order and disposition of its objects. These objects as we have discussed them are simple natures. Thus the whole Method rests on the doctrine of simple natures. It is because Descartes believes that the objects of knowledge are simples and knowledge itself the combination of these that the Method becomes viable. Analysis, synthesis, intuition, deduction, are the only procedures which yield knowledge because it is only by following these that we will be able to uncover simple natures and their inter-mixtures.

If this is a true picture of Descartes' Method then a number of questions of a critical nature present themselves. What reasons does Descartes have for advocating the acceptance of the Method along with its concept of knowledge and, what reasons can be provided

in support of Descartes' claim that deduction, or more generally speaking, the entire Method itself if properly followed will not yield erroneous results, or why cannot one draw faulty inferences. And finally, what justification can Descartes offer for the assumption that in material objects only simple natures and their inter-mixture are present. The justification for this, as we shall see, is itself the purpose which the Meditations were written for.

## 3. Reason

In the foregoing section my effort was directed toward the unfolding of the inter-structure of Descartes' Method, in this section I hope to uncover that hidden mechanism which makes the Method work. Descartes' Method is not simply an instrument to be used in the discovery and construction of knowledge but, in itself, represents or illustrates the role of the mind, the "we who know", in the acquisition of knowledge. Knowledge is self-evident cognition; intuition and deduction are not only "mental operations" but the only operations which yield knowledge. Thus the search after truth has a mental component. Let us isolate this aspect of knowledge.

With regard to we who know (Rule XII), Descartes enumerates four "faculties"* - understanding, imagination, sense, and memory,

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*For a discussion of Descartes' use of the term "faculties" see pp. 37, 40.

and asserts that the understanding alone is capable of perceiving the truth. Descartes does not offer us a complete picture of the knowing agent, what the mind is, what body is, and the faculties which assist our knowing, and his brief presentation is prefaced by the admission that the following "facts" need not be believed unless one is so inclined (HRI, 36). In other words, the following analysis is unsubstantiated, no justification is presented for its validity. The reasons for this qualification are interesting; however, they cannot be revealed at this time.

Sense, primarily, is classified as passive (HRI, 36) and operates on the same principle as wax receiving an impression from a seal. And while the external sense organ is that which is stimulated by an object, the "idea or figure" of the object is carried to the common sense and impressed on the fancy or imagination. Thus, imagination, in this respect, is passive, as is memory, characterized here as the retention of impressions. The power by which we come to know or become aware of impressions or ideas, here no distinction that is clear is made between these, Descartes tells us is "purely spiritual". However, in his next statement rather than clarify what he means by this, Descartes obscures the nature of this power when he adds that this power is "not less distinct from every part of the body than blood from bone or hand from eye" (HRI, 38). What is clear though is that this power is a "single agency, whether it receives impressions from the

common sense simultaneously with the fancy, or applies itself to those that are preserved in the memory, or forms new ones" (HRI, 38-39).

One agency then is responsible for all awareness. Properly called, this is mind. It is passive when it attends to impressions previously formed in the imagination and active when it forms new impressions of its own. It is mind which sees or touches when it applies itself to the impressions of the senses. It is mind which is said to remember, or imagine, or conceive (when it creates new impressions). And it is mind when acting alone which understands. Thus understanding is an activity of mind alone. But what is it to "understand"? Descartes does not elaborate. However, if it is the understanding alone which is capable of perceiving the truth, then "understanding" can only be awareness of the truth. And since the only two operations which bring this awareness about are intuition and deduction, these must be operations of the understanding, of mind when it acts alone.

One can now begin to see why Descartes' Method is the only method prescribed for the search after truth. If truth is a function of the understanding alone and intuition and deduction operations of the understanding, then Descartes' Method is nothing other than the natural functioning of our understanding. In describing his Method, Descartes describes not only a means for acquiring the truth but also the way in which our understanding operates. Method, then, is nothing other than human intelligence functioning in accordance with its own nature, it is

nothing other than the way my understanding works. To understand Descartes' Method is to understand how the "faculty" of pure understanding operates, it is to understand "mind" itself. My argument then is this: since Method is mind at work, this provides the basis for an answer to why Descartes' Method is the only means to knowledge. If intuition and deduction were not natural operations of the understanding, then the Method would be entirely superfluous.

Method then is an expression of the nature of the understanding. But let us characterize this nature a little more carefully. Earlier intuition and deduction were characterized as one single process. The time has come now to name that process. And the title to be given it is that of "reason". Peter A. Schouls, in "Descartes and the Autonomy of Reason", is careful to point out that both intuition and deduction together and neither singly express the nature of reason.[13] However, he fails to state why this is so. The reason, I think, lies in the characterization of reason as a process. A "process", roughly, is something which involves a movement or progression. Deduction, in itself, is just this: a movement from inference to inference. But deduction, alone, cannot provide the first principles upon which all inferences follow. Intuition must supply this. Thus, for the process to be complete, both intuition and deduction are necessary.

It would be unfair to hold Schouls accountable for not clarifying why both operations are necessary components of reason, since he is

primarily interested in the problem of reason's autonomy and thus provides only the material necessary for the illumination of his argument, rather than an exhaustive study of the nature of reason itself.[14] However, we ourselves cannot rest content with only a partial grasp of reason. Method consists of more than intuition and deduction, and if Method is but the process of reasoning then reason itself is not simply intuition and deduction. Along with these, Method involves analysis of problems or complexities into their simpler constituents. Reason, then, too, if Method is an expression of reason, must also be analytic, it must, in nature, be predisposed to breaking up complexities into simpler parts. It must be predisposed to the discovery of simple natures.

Reason, then, is not simply the process of intuition and deduction, that is reason is not simply a process of construction, it is also, and prior to this, a process which breaks up the complex into its simpler elements. Reason has both a synthetic and analytic aspect. The analytic aspect, as above, consists of the breaking up of complexities into their simpler elements, or into their constituent simple natures. In its synthetic function reason accumulates knowledge by discovering connections and relationships between the simpler elements. But it must not be forgotten that in all of this there is a precise order to be followed. One does not simply connect simples together in any haphazard fashion. One begins with the simpler connections, the least relative, and deduces

step by step the chain of consequences until the most relative, or most complex relation is discovered. The origin of this ordering we have previously traced to the disposition of the Method's objects. Thus reason in its orderly deduction of knowledge is not itself the source of this order but merely discovers it as present in its objects. Reason does not create simples and their relations but discovers these in nature.

To reason, then, is not simply to draw inferences but to draw inferences in an orderly manner - from the simplest relation to the most complex. But if reason operates as so described one can raise the legitimate question of why this power of reason cannot lead one into error if properly conducted. The cornerstone of any epistemology rests not merely on its ability to explain the basis of our knowledge but also in its ability to account for error. If error cannot be satisfactorily accounted for then the theory is clearly deficient. Within the Rules error is grounded not in faulty inference but in the acceptance of groundless propositions as the basis of inference. But why cannot deduction, or more broadly speaking, reason, draw false inferences? The answer to this question, as I shall show, rests on the autonomous status of reason.

Is reason autonomous? The statement that reason properly conducted cannot err displays Descartes' apparent trust in reason; for Descartes this is a faultless instrument. But what is the basis of this trust? Is reason trustworthy in itself, that is totally autonomous, or

is it to be trusted because it possesses some kind of external sanction? Those familiar with current Cartesian literature[15] will instantly recognize the difficulties commentators have in asserting a clear answer to this question. It is not my intention to join ranks on this issue; rather, having noticed that most of the discussion on this question centers entirely on the trustworthiness of reason within the Meditations, I cannot help but wonder if an important source of information has been overlooked. The clearest formulation of reason occurs in the Rules. Is it not possible then that a clue to an answer may be found within this work?

One might thus hope to gain an insight into this problem by scrutinizing Descartes' doctrine of Method. But, unfortunately, not many clues are here provided and what is stated is far from clear. Still, what does emerge may be of help. With regard to the basic operations of the Method, intuition and deduction, Descartes, in Rule IV, states that "unless our understanding were already able to employ them, it could comprehend none of the precepts of that very method, not even the simplest" (HRI, 10). That the understanding is readily able to intuit and deduce supports indirectly the proposition that reasoning is a natural propensity of our understanding. And yet because the understanding is naturally able to intuit and deduce,* does this in itself guarantee its

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*This claim is by far one of the most significant in all of Descartes' writings, and requires more attention than possible here. And yet, if reason, as Descartes conceives it, is not a natural propensity of our understanding, if the process of reasoning is other than Descartes

infallibility?

In the next paragraph, in urging for the acceptance of his Method, for the acceptance, indirectly, of his concept of reason, Descartes suggests that his Method is not at all something entirely new, that the ancient philosophers did have some knowledge of it, that they were naturally drawn towards it. Upon the heels of this follows: "For the human mind has in it something that we may call divine, wherein are scattered the first germs of useful modes of thought" (HRI, 10).

Granted, that the meaning of this sentence is far from clear, the message, nevertheless, appears to be that in the mind there is something which contains the rudiments of "useful" thought and this is called the "divine". Is the "divine" then responsible for our ability to reason, reason being a "useful mode of thought", or is this ability itself "divine" because it is a useful mode of thought? Although Descartes' language suggests that the proper way of looking at this is the former, the ambiguities, in particular the unclarified term "divine", in the above statement, makes the suggestion that some outside thing called the "divine" is responsible for our way of thinking almost nothing more than a wild speculation. But then, one must not forget that in the fourth Meditation Descartes consistently speaks of "faculties" given to us by God, namely,

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(continued from pg. 58)

describes it, then in so far as "reason" underlies Descartes philosophy, the whole corpus of his writings falls to ruin.

the understanding and the will. And in Principle XXX, Descartes speaks of the light of nature, man's cognitive power, as "the faculty of knowledge which God has given to us" (HRI, 231).

What this amounts to is the conclusion that reason is not autonomous, that its trustworthiness in some way rests in God, or more precisely it is trustworthy because it is given to us by God. Of course, the exact relation between reason and God constitutes a major problem within Descartes' writings; yet, though the details of this relation present numerous problems, the general proposition that the trustworthiness of reason rests in God's hands cannot, in my mind, be challenged. But if reason, itself, is the basis of Descartes' Method, if it is the instrument which discovers knowledge, then ultimately, the only reason we have to accept Descartes' Method is its roots in a rational faculty given to us by God.

## 4. Concluding Argument

At best I have presented a general outline of Descartes' Method and of his concept of reason, which the Method is considered an exercise of. And if the material presented appears in too favorable a light, it is precisely because my aim lies in the uncovering of the foundations of Descartes' thought and not in a critical assessment of his thought. And this, I hope to show, is precisely reason itself. But before this, let us put Descartes' concept of reason into perspective. At the

beginning of this chapter I referred to Rule I and Descartes' claim that knowledge consists of sound judgement. Rule I, itself, contains the statement that the end of all study is sound judgement. But we have seen that Method yields knowledge in that we combine the self-evident (simple natures) via deduction. We must inquire then what the relationship is between combining the self-evident and the pronouncement of sound judgement.

We need not search distant hills, for an explanation, for reason. the process of construction is also, according to the Discourse, Part I, "the power of forming a good judgement and of distinguishing the true from the false" (HRI, 81). To distinguish the truth, which is to make a good judgement, is to reason. But reason itself is the process of drawing inferences. Yet, to draw an inference, to reach a conclusion, is to formulate a truth. Thus through reason we come to know the truth and to make sound judgements as to what is the truth. To illustrate reason as the power of good judgement, let us again consider the nature of the magnet. If we want to form a correct judgement as to the nature of this stone, what are we required to do? We are required to deduce the character of the inter-mixture of simple natures, the characteristics of these as they are combined in the magnet which produce all the effects connected with the magnet. In doing this we reason and in doing this, in uncovering the nature of the magnet, its particular combination of simple natures, we come to form a correct judgement

in regard to its nature.

Thus, to form a good judgement is to reason. To deduce all the facts necessary to arrive at a clear understanding of something, in this case, the magnet, is to in the end form a correct judgement, to discern the true from the false.

This example illustrates the connection between knowledge and the ability to form a good judgement. To know, to discover the answer to a problem amounts to the same as the forming of a correct judgement about something, i.e., the nature of the magnet. A correct, or sound, judgement is one based on the conclusions of rational deduction. Sound judgement then is possible only on the condition that the Method is followed. But Method itself is an exercise of reason; hence, good judgement is naught but reason, it is the end result of the rational process.

Now, with regard to reason as the foundation of Descartes' entire philosophy, the first step is to solidify the proposition that Method is nothing other than human reason. For it is possible to maintain that Method is the key to Descartes' thought and yet deny that this statement is equivalent to the statement that reason underlies Descartes' philosophy. In other words, it may be proposed that Method is an exercise of something other than reason. For instance, A. E. Keaton, "Descartes' Method", sees Descartes' particular method as a species of the "general method of mathematical analysis".[16] And if one wished to stress the mathematical nature of Descartes' thought it is not

impossible to conclude that Method as an application of mathematics is the yoke of Descartes' system.

No one can rightly deny the influence of Arithmetic and Geometry on Descartes' thought. But let us ask how Descartes conceived these disciplines. In Rule II Descartes gives his reasons for his attachment to these. Two reasons are put forward (HRI, 5). The first is that these disciplines deal with objects so "pure and uncomplicated" that they cannot be rendered uncertain by experience. The second, that these disciplines consist of nothing more than "the rational deduction of consequences". The first reason Descartes gives suggests that the objects of Arithmetic and Geometry are objects of intuition - pure and uncomplicated objects not grounded in experience (i.e., simple natures). And the second that the process of mathematical reasoning is none other than the deduction of consequences. What I am proposing is that Arithmetic and Geometry have significance for Descartes because as modes of knowing these, and these alone, express the nature of the understanding of reason itself.

> These two methods [Arithmetic and Geometry] are nothing else than the spontaneous fruit sprung from the inborn principles of the discipline in question [the human mind] (HRI, 10).

> Mathematics accustoms the mind to recognizing the truth, because it is in Mathematics that examples of correct reasoning, which you will find nowhere else, are to be found (CB, 48).

Mathematics, or Arithmetic and Geometry, two disciplines within the field of Mathematics,* are grounded in the human mind, and Mathematical reasoning is but an illustration of human reasoning. It follows then that Mathematical reasoning is of value to Descartes only because it is an exercise of human reason. Thus it is human reason and not simply Mathematics which lies at the basis of Descartes' Method. This though is not to ignore the fact that Descartes' Method is clothed in an "outer husk" of Mathematical demonstration. But again, this is simply the "outer husk" of the Method, its inner core is the natural process of human reason.

It cannot be denied then that reason, though be it expressed in the form of mathematical reasoning, is the foundation of Descartes' Method. Let us now examine the relationship between Method and Physics. Physics, roughly, is that discipline which has as its object the material world. To determine the relationship between Physics and Method, i.e., reason, I propose to examine Descartes' description of material phenomena, in particular that of fire, for the description of fire in general typifies Descartes' account of all material objects. From The World, Chapter II:

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*"When first I applied mind to Mathematics . . . I paid special attention to Arithmetic and Geometry" (HRI, 11).

> When it burns wood or any similar material, we can see at a glance that it removes small particles of this wood, and separates them one from another transforming thus the finer parts into fire, into vapor and smoke, and leaving the grosser parts as ashes (Selections, 315).

Thus Descartes' analysis of fire consists of two things. First, small particles and second, the separation of these as the cause of the phenomenon we witness and call fire. The fire itself is comprised of the smaller particles of wood and the residue, or ash, is but the coarser parts. The agent responsible for the separation of particles is the flame, which Descartes describes as:

> composed of small parts which are in motion separately one from another, with a motion very rapid and very violent, and which, thus moving themselves, push and move with themselves the parts of the bodies which they touch, and which do not offer them too great resistance (Selections, 315-316).

Let us conceive the matter thus: the flame is a group of small rapidly moving particles. When applied to wood, the particles in the flame through their rapid violent motion break up the particles in the wood. The smaller parts offering the least resistance are consumed by the flame, that is they, when touched, assimilate the same motion as the particles in the flame and thus themselves become a part of the agent. The grosser parts, because of their size, offer more resistance than the finer particles; thus, when struck they will not assimilate the rapid motion of the particles in the flame but will spin off and fall as ash.

At first glance, Descartes' description bears little resemblance to his analytic procedure in the Method. But let us recall that the simples which constitute knowledge are not strictly defined by Descartes and that the simples we are aware of can be considered as constituent elements of the physical world. Earlier, we also characterized the absolute term, or the simplest and easiest term in a series as that which contains the essence or key to the solution of problems. Now, if we consider Descartes' description of fire as an answer to the question what is fire, we can immediately see that the answer consists of the particular motion of small particles. Thus the small particles would be the simple, or the absolute term, which account for Descartes' explanation of fire; and the various sizes and motions, which constitute the characteristic inter-mixture of simples found in fire, would be that which accounts for the effects of the flame which we witness. Descartes' account of fire then is none other than an explanation based on simples, small particles, and their relation or inter-mixtures (motion and size) and thus follows the Method exactly in the concept of its objects. And that which deduces the inter-mixture of simples to arrive at knowledge is nothing other than the process of reason; thus, the above account of fire is a rational explanation based on the notion of simples and their inter-mixture.

That the nature of matter in general is explained by Descartes in terms of small particles in motion is verified by a number of various

places in his writings, for instance, in the First Discourse of the Meteorology and in Chapter VI of The World. And if these small particles are to be taken as the simples out of which our knowledge of the material world is constructed, then clearly the Method, and reason itself, is at work in Descartes' physics. Scientific knowledge is achieved then through the Method, by the rational deduction of relationships between particles. Let us now turn to philosophy proper, or metaphysics. The objects of metaphysics, as outlined in the Dedication to the Meditations are two - the human soul and God. And to treat these, Descartes, noting that his Method was cultivated for the resolution of difficulties of every kind in the "Sciences" feels it his "duty" to apply the Method in the resolution of these difficulties also (HRI, 135). Thus the intention of application is clearly evident. The existence of the soul as distinct from the body and the existence of God are then demonstrated within the text of this work. It is beyond the scope of this project to consider in detail the various complexities and problems which emerge in the course of Descartes' demonstrations. But like Beck[17] I feel that the methodological basis of the Meditations can be established with satisfaction by presenting a general outline of the material in this work.

If one looks carefully at Descartes' procedure in the Meditations one will discover that this procedure is none other than that of the Method. For instance, the purpose of the first Meditation is to

clear the ground for certain knowledge by the elimination of all false opinions. Descartes proposes to achieve this by examining the principles upon which his opinions rest; these are two - sensation and reason. He then examines both in turn and concludes that both are uncertain. But what has happened here? Let us recall that Rule V directs us to reduce all complex propositions into those that are simpler. And is this not what Descartes has just complied with? The complex in this case is "all former opinions" and these are reduced to two simple propositions or principles - sensation and reason. Then an analysis of each in turn is performed to discover the degree of their certainty.

The first Meditation concludes that no certain knowledge was contained in any former opinion and this on the basis of the "evil genus" hypothesis. The second Meditation produces Descartes' first certain truth. In reflecting on the possibility that he may be deceived, Descartes recognizes immediately that he must exist, for how is it possible that he be the victim of deception if he does not exist? In the words of the Discourse:

> But immediately afterwards I noticed that whilst I thus wished to think all things false, it was absolutely essential that the 'I' who thought this should be somewhat (HRI, 10).

Thus Descartes has his first piece of certain knowledge - an intuition of his existence. And indeed, it is an intuition, for the fact

that one exists is offered in the Rules as an example of an intuition (HRI, 7). And furthermore, in his Reply to Objection II, Descartes states:

> He who says, 'I think, hence I am, or exist' does not deduce existence from thought by a syllogism, but, by a simple act of mental vision, recognesis it as if it were a thing that is known per se (HR II, 38).

Hence, the fundamental operation of intuition provides for Descartes his first piece of certain knowledge. At this point Descartes knows that he exists but he does not yet know what this 'I' is that exists. Again, he proceeds by analysis of all his former thoughts, but this time on the nature of the 'I' and concludes that the 'I' is a "thing which thinks". Once establishing the nature of the 'I' or the thinking thing, Descartes proceeds in the third Meditation via deduction to the conclusion that God exists.

> And the whole strength of the argument which I have here made use of to prove the existence of God consists in this, that I recognized that it is not possible that my nature should be what it is, and indeed that I should have in myself the idea of God, if God did not veritably exist (HRI, 171).

The details of Descartes' argument for the existence of God are complex and difficult to unfold but its general design, in essence, is but an illustration of reason at work. Intuition of his existence is followed by an analysis of the concept of the 'I' which exists. The 'I' is a thinking thing, that is it has thoughts or ideas. And the ideas

contained in the mind are reduced by Descartes, to three simple kinds (again, the procedure of dividing the complex into its simpler parts is adhered to). Ideas are classified as innate, adventitious, and fictitious (HRI. 160). After examining each of these in turn. Descartes concludes that only the idea of God has its origin in something other than the human mind; it is not an adventitious or fictitious idea. The conclusion which follows is that God must exist because the idea of God, in so far as it does not originate in the human mind, necessitates God's existence. Thus, intuition of self, analysis of ideas, leads to the inference that God exists. Analysis of the simple nature, the thing which thinks (mind), of its contents, leads to the rational deduction of the existence of God.

One can see then that certain arguments in the Meditations illustrate the influence of the Method on Descartes' metaphysics. But this can also be seen in the general design of the Meditations. The purpose of the Meditations is to secure certain knowledge, in particular to establish the certainty of the existence of material bodies. The first proposition toward this conclusion is provided by intuition - the existence of the self, the 'I'. This, if you like, is the absolute term, the simple proposition on which all those that follow depend. On the basis of this proposition, the first deduction Descartes makes is the existence of God. And this conclusion eventually leads to the certainty of the existence of material bodies. Thus the whole of the Meditations, in its constructive

aspect is but one long chain of reasoning, which stems from a basic intuition and in which each step is built upon the foundations of the preceding step. This, and the above, although very general, I submit as adequate to show that there is a connection between the procedure or arguments which establish Descartes' metaphysical principles and the methodology of the Rules.

We have viewed briefly the methodological foundations of Descartes' Physics and Metaphysics. But one thing remains yet, and that is to explain the connection between Physics and Metaphysics. If this can be adequately comprehended then in as much as Descartes' concept of knowledge incorporates both of these into one system, the factor which accounts for the necessity of this connection will lead to that which truly underlies Descartes' entire thought. And here again we must see the role of reason in this connection. Earlier I noted that Descartes' account of the knowing subject, of sensation and the knowing power, was presented in the twelfth Rule as an unsubstantiated hypothesis. But this is not the only theory that Descartes introduces as hypothetical. In the Meteorology, with regard to terrestrial bodies, Descartes admits:

> It is true that since the knowledge of these matters depends on general principles of nature which have not yet, to my knowledge, been accurately explained, I shall have to use certain hypotheses at the outset, as I did in the Optics. But I shall try to render them so simple and easy that perhaps you will have no difficulty in accepting them, even though I have not demonstrated them (Olscamp, 264).

And again, in regard to the entire treatise of The World, Descartes writes:

> Let, then, your thought pass for a little while beyond this world, that you may behold another wholly new one, which I shall cause to rise to view in imaginary spaces (Selections, 318).

In the text which follows, Descartes proceeds to paint his imaginary world. But why is this world imaginary, and why is the treatise of the Meteorology and the description of the knowing aspect, in particular of sensation, prefixed as unsubstantiated facts? The answer, I think, lies in the above quote from Olscamp. that knowledge in those matters, in Descartes' physical theories depend on general principles of nature which have yet to be demonstrated. A number of these principles are outlined in The World:

> that each individual particle of matter remains always in one and the same state, so long as contact with others does not compel it to change it (Selections, 323).

> that when one body impels another, it cannot impart to it any motion without at the same time losing so much of its own, nor take from it so much as its own is thereby increased (Selections, 325).

> that when a body moves, although its movement is most frequently in a curved line... nevertheless each one of its particulars in particular tends always to continue its own motion in a straight line (Selections, 327).

I suggest that it is principles like these, which regulate the initial confusion and chaos in Descartes' imaginary world, which stand

in need of demonstration. If these can be demonstrated as true then one has every reason to believe that these principles and the order they account for are applicable to all worlds in which we perceive similar order, i.e., the old real world. These principles and the world they regulate are both created by God (Selections, 318, 322). Thus if one can establish the existence of God then one has adequate grounds to believe in the certainty of these principles. Descartes' Metaphysics, as we have seen, seeks to establish the existence of God. Thus, Metaphysics and Physics are connected in that God, the object of metaphysics, once established guarantees the principles which account for the order in the physical world.

This is one way in which a connection between Metaphysics and Physics can be established. There is also another connection. Descartes' physical world consists of small particles, simples, and their various relations (i.e., motion and size). Knowledge of these is required by the cognitive activity of reason. Yet, for reason to discover the truth in these matters two prior conditions must be satisfied. Reason is but a particular mode of knowing differentiated from imagination and sensation in that it is a form of pure cognition. And yet for my reason to operate as a mode of knowledge what is required is that I exist. This is the first condition. Furthermore, reason operates on objects which it is aware of as the inter-mixture of simples. But reason can be aware of such objects only if such objects constitute the nature of the physical world.

The objective of the Sixth Meditation, Descartes states, is to prove the existence of material things, that is that the material world exists. This material world which Descartes seeks to establish, though, is not simply any material world, but the material world as Descartes conceives it to be, as consisting of nothing but extended bodies and their motions (HRI, 254-255), of the simple nature: extension and its various relations. The second condition then is the existence of material objects.

Thus for reason to operate, for reason to require knowledge, two prior truths must first be established - the existence of self and of the material world. Without these, knowledge is impossible, for there would be no certainty with regard to the existence and nature of the knower and the known. And it is these objects - the self and the material world, the nature of, and their existence, which constitute two of Descartes' main metaphysical presuppositions. The third, God, is necessary, for although Descartes has immediate intuition of the existence of the knower he is not immediately certain that the material world exists in nature as extended matter, but through the sanction of God this can be demonstrated as a certainty.

Thus Metaphysics supports Physics in that knowledge of physical objects is impossible without the metaphysical foundations of mind and God. Knowledge for Descartes can only be certain knowledge, and certain knowledge is knowledge based on awareness of first causes or

Principles. The first Principles, the causes, the a priori necessary conditions, for knowledge are mind and God. In this way, Physics and Metaphysics join to form one complete indubitable system of knowledge. Without the metaphysical foundations, Descartes' physics, however internally consistent and comprehensive, cannot produce certain knowledge, for Physics, itself, cannot account for its own possibility. Physical knowledge is possible only if mind and God exist. And this only Metaphysics can establish.

Whether Descartes' Metaphysics actually succeeds in this is beside the point, for my purpose is to outline why there must be a connection between the roots and the trunk of Descartes' "tree". It is human reason, the instrument of all knowledge which makes such a connection necessary. Reason cannot function, no certain knowledge is possible without mind and God.

Descartes' Metaphysics, then, is a necessary component of his theory of knowledge. And his metaphysical foundations, if taken as sound, do eliminate the worries of the sceptics. Indubitable knowledge is obtainable for Descartes because the tree of knowledge is the tree of reason and reason in its metaphysical employment provides the foundation for reason in its physical employment. However, I have tried to show that it was not scepticism, per se, which required Descartes to venture into the metaphysical realm but rather, his concept of knowledge as perfect knowledge which necessitated such a foundation.

Of course, the outcome is the overturning of scepticism, if Descartes' tree is sound, but the aim is a complete system of rational deduction. And this is the motivation and core of Descartes' entire thought.

But in his endeavor to extend reason to all things that man is aware of, a problem of major import comes to the horizon. To extend Method to Physics and Metaphysics singly is permissible. But if the Metaphysics is to serve as the foundation and justification for the Physics, for truths about material objects, then a deep-paradox lies at the heart of Descartes' system. For the physical theories as constructs of reason rests on metaphysical principles which again are the constructs of reason. Thus reason is used to justify reason. The employment of rational deduction in metaphysics justifies, or guarantees the veracity of, the employment of reason in the physical field. In other words, Descartes' physics yields knowledge of the material world only because the same process of reasoning yields knowledge of metaphysical principles.

This apparent paradox, to those familiar with Cartesian literature, is but a reformulation of the complex problem known as the "Cartesian Circle" or Descartes' "Validation of Reason". It is not within the scope of this project to sort out the philosophic debate on this issue. The best I can do is to acknowledge the presence of this apparent problem as a factor in the evaluation of the soundness of Descartes' scheme for perfect knowledge. My purpose being to

burrow towards the foundations of Descartes' scheme, having achieved this, I must rest content, for the moment, with my own discoveries.

## Chapter III

## THE NATURE OF MAN

### 1. Mind and Matter

Looking back, in the first two chapters of this thesis I seem to have strayed far from my expressed purposes in the Introduction, that is to map out the foundations for the dualistic terminology and the origins of the mind-body problem in the philosophy of Descartes. But let me, briefly, put this material into context. An analysis of Descartes' concept of knowledge has yielded the methodological foundations of his thought. We have seen the structure which knowledge has, and have witnessed the operation through which it is acquired, namely, reason. But for reason to acquire knowledge two metaphysical claims must first be made - the assertion of the cognitive self and of the existence of God as the creator and guarantor of the veracity of knowledge about the material world, about its existence and nature. For without the material world there would be no object for reason to operate on and without mind there could be no reason, no knowledge. Thus we are led directly to mind and matter.

Let us first expand on Descartes' notion of mind. Reason is

pure understanding, or pure "mind" at work. Thus implicit in Descartes' rational methodology is the general claim that mind is the ground of all knowledge. Earlier, "mind" was characterized as the "cognitive power", as the centre of awareness in man. And, again, the simples which the mind is aware of are classified as falling into three categories - the purely intellectual, the purely material, and those common to both (i.e., existence, duration, unity). Thus, the mind has knowledge of itself, in so far as it is purely intellectual in nature, knowledge of purely material things, and of notions which are common to both. What then does the mind know of its own nature?

First of all we know that the mind is singular, it is one single agency, or cognitive power, which has the capacity for receiving various impressions such as sensations, images, memories, and understanding. With regard to sensation, imagination, and memory, in so far as these are dependent on bodily impressions they cannot be regarded as activities of mind alone. It is the understanding alone which constitutes pure mental activity. But what is this pure activity of the mind? I believe, the answer lies in Descartes' analysis of mind in the second Meditation.

Descartes' rejection of all probable knowledge, of all that is doubtful, or alternatively, following his Method, his analysis of all his former opinions with an eye for their truth, results in the discovery of one thing that is certain, one simple that cannot be doubted, and that

is his own existence. Conceiving the first Meditation as Descartes' preliminary analysis of the complex question - what can be known for certain, the answer given in the second Meditation is that the first knowable is intuitive knowledge of one's own existence.

> But I was persuaded that there was nothing in all the world, that there was no heaven, no earth, that there were no minds, nor any bodies: was I not then likewise persuaded that I did not exist? Not at all; of a surety I myself did exist since I persuaded myself of something [or merely because I thought of something] (HRI, 150).

Reflecting on his ability to doubt, or to think of something, Descartes is led to assert his own existence. What cannot be doubted is doubt itself; thus, Descartes, in as much as it is he who doubts, cannot because of this deny his own existence. Yet, at this point, this is all that Descartes can maintain. He must once again conduct an analysis, but this time of all that he formerly believed himself to be. Let us briefly follow Descartes in his analysis.

The first opinion to be rejected is the scholastic definition of man as a "rational animal". This, on the premise that such a definition leads to an "infinitude" of more complex questions - what is "rational", what is "man" (HRI, 150, 317). Instead, Descartes turns away from this method and its preconceptions (to say that man is a "rational animal" is to already have a preconceived notion of man) to consider the thoughts which spring from his own mind. This move is not since it that for Des the s itic

approach leads to more complex and obscure propositions rather than a clear and evident cognition of the truth.

Since the object of this enquiry is the nature of the 'I', it is, of course, appropriate that Descartes turn inward to consider his own reflections on the nature of his being. And here two possibilities are examined - body and soul. True to his Method, Descartes takes the complex problem of what his nature consists of and divides it into simple components, in this case the two possible simples are mind and body, then proceeds to scan each in turn. As to the body, Descartes has no doubt about its nature and provides a clear definition (HRI, 151). We need not concern ourselves with Descartes' concept of the body at this point, though we will return to it shortly. What is important at this stage is Descartes' rejection of bodily activity as a necessary part of his nature. On presenting his definition of the body Descartes immediately asks if he can be certain if any of the properties which pertain to the body can be affirmed as belonging to his nature. And the answer is negative, on the basis that he may be deceived by the malicious genius into thinking that the body exists when it in fact may not. Thus Descartes' uncertainty with regard to the existence of material objects leads him to conclude that the body cannot be a part of his nature; that the properties which belong to bodies cannot be attributed to the 'I' that exists for the very existence of the body is in doubt.

The rejection of bodily properties as expressive of the nature of the 'I' which exists leads Descartes to examine the alternative, that his nature is bound up with the soul. And here Descartes finds an attribute which belongs to and which cannot be separated from the 'I'. Descartes can only be certain of his existence because he thinks. It is on account of the very process of thought that he can claim to exist ("I think, therefore I am"). Therefore, his existence must be bound up with the ability to think. Hence, thought must pertain to his nature.

> I am not more than a thing which thinks, that is to say a mind or soul, or an understanding, or a reason ... I am ... a real thing and really exist, but what thing? I have answered: a thing which thinks (HRI, 152).

At this point, I am not directly concerned with the validity of Descartes' argument that the 'I' is but a thinking thing. And since it will be necessary to return to this proposition in the coming section, I think it best to reserve all comments until then. What is important in the conclusion reached in the above passage is not simply that the 'I' is identified with thought but also that the mind, soul, understanding, and reason are all similarly associated with thought. And all of this is seen by Descartes as distinct from the body. At least in conception, for he cannot be certain that the human body which may not exist is actually different from the self which exists (HRI, 152). Thus at best Descartes has a conception of himself as a thinking thing and this is different in nature from the body. It remains for the sixth Meditation

to prove that there actually is a distinction and separation between mind and body.

Pressing on with his analysis, in the attempt to grasp more fully his own nature, Descartes expands his concept of a thinking thing:

> But what then am I? A thing which thinks. What is a thing which thinks? It is a thing which doubts, understands, [conceives], affirms, denies, wills, refuses, which also imagines and feels (HRI, 153).

Thus doubting, conceiving, willing, imagining, feeling, all pertain to the nature of the 'I', are all modes of thought. We can see then that "thought" for Descartes does not refer to one simple operation but to a variety of operations. Yet, we still need a clear formulation of thought itself. This Descartes attempts in Principle XI, Part I, of the Principles:

> By the word thought I understand all that of which we are conscious as operating in us (HRI, 222).

And again, when he reformulates his argument in "Geometrical Fashion" as an appendage to the Second Objections:

> Thought is a word that covers everything that exists in us in such a way that we are immediately conscious of it (HR II, 52).

It would seem then that thought is to be connected with consciousness. To think is to be conscious of something. And understanding, willing, imagining, etc., as modes of thought are those various

operations of the mind which we are conscious of. To clarify this point, let us turn directly to Descartes' concept of the mind. Thus far we have had two formulations of the concept "mind". In the Rules it was referred to as the "cognitive power", or "that power by which we are properly said to know things" (HRI, 38); and as previously quoted in the Meditations, it is nothing other than the thing which thinks.

First, let us consider mind as the cognitive power, or the power by which we come to know things. One possible way of illustrating what Descartes means by this is through a brief examination of his description of the process of sensation. The general mechanism which accounts for sensation is that the mind receives impressions of external objects through the mediation of the nerves. * In sensation the external sense organ is stimulated by an object, the animal spirits carry an impression of this (what this impression is is problematic) to the brain, or more properly to the pineal gland, which is the seat of the soul in the body. The impression of the object, once it reaches the pineal gland, via the movement of the spirits causes in the soul an awareness of that which stimulated the movements in the body. For instance, if an animal approaches us, the

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*For a full account of this process, see the Optics, Fourth Discourse, or The Passions

light reflected from its body causes an image of it in each eye and these two images by means of the optic nerve form two similar images in the interior surface of the brain. From there, by means of the animal spirits, highly refined particles of blood, these images "radiate" toward the pineal gland, via the nerves, for all the nerves converge into one single passage in which the pineal gland is situated. "By this means the two images which are in the brain form but one upon the gland, which, acting immediately upon the soul, causes it to see the form of this animal" (HRI, 347-348).

Leaving aside the adequacy of Descartes' account, what is clear is that the mind is the center of awareness, it is in the mind that awareness occurs. In this way, the mind is the power of awareness or consciousness. It is the agent responsible for all knowing, or the power of cognition in man. If this is what mind truly is for Descartes, then all thought is but a particular mode of awareness, for instance, sensation and feeling would be awareness of external objects while understanding would be awareness of truth, or true knowledge via the process of reason. Thus the concept of mind as the cognitive power is not inconsistent with Descartes' understanding of thought as having various modes, or particular objects.

Let us now turn to consider the notion of mind as a thinking thing. If Descartes' two notions of mind are consistent, the "thinking

to the it is

in Descartes' proof of his existence. Conscious of his own doubt, Descartes cannot but affirm his own existence. But what is it that he affirms as existing if not the agent which is conscious of doubt, if not the agent which is aware of a particular mode of thought, i.e., doubt? And this cognitive agent, the 'I' which exists is nothing other than the thinking thing, the mind. Thus "mind", "thinking thing", "cognitive power", are all synonymous.

To get clearer on the relation between thought and consciousness, let us once more consider the above model of sensation. It is the mind which sees or is conscious of the animal which approaches us. Thus "seeing" is a mental operation, or a function of the mind. But this "seeing" in so far as it occurs in us as thinking things or conscious beings is also a thought, or a particular mode of thought, sensation. Thus thought and consciousness are equated but not as subject-object. Thought is not simply what one is conscious of but is itself consciousness of a particular thing, for instance, in the mode of thought which is sensation, consciousness is of a particular material object.

We have seen then what Descartes means by "mind" and by "thought". We have also witnessed what sensation is, awareness of material bodies; but what of understanding, of the activity of mind alone? If mind is conscious activity, then "pure" activity of the mind would be activity which springs from the mind alone. Sensation, as a

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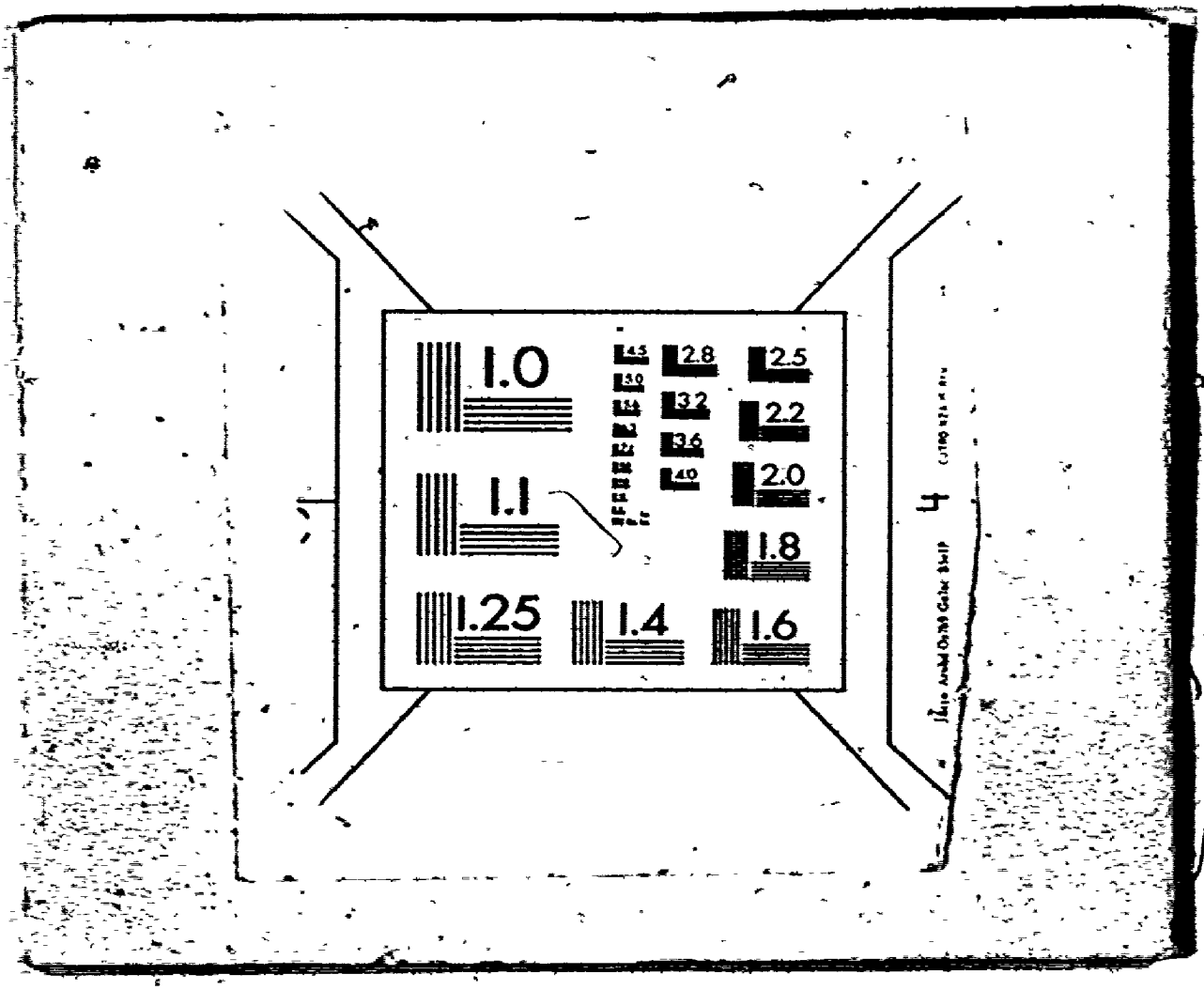


bodily movements, and can occur only through the interaction of mind and body; thus, it is not pure activity of mind alone. Conversely, then, pure activity of the mind must refer to thoughts not related directly to physical objects, as effect to cause. The label which I give to such activity is "reflective consciousness" and to illustrate what I mean by this I will use Descartes' example in the second Meditation of how knowledge of the nature of wax is obtained. And this, incidentally, will serve as a good start for the coming discussion of the nature of matter.

We have already disclosed that sensation results in awareness of material objects; but for Descartes this mode of knowing does not constitute the true source of our knowledge of material objects (HRI, 255). This is illustrated by Descartes' famous analysis of a piece of wax. In his hand, at the outset of the analysis, Descartes holds a fresh piece of wax. He can taste its sweetness, behold its colour, figure, and size, he can sense its hardness and coolness, and can hear a sound when he strikes it. All of these qualities are perceived through the various senses. But then Descartes asks us to notice what changes occur in the wax as he draws it closer to the fire. The taste is exhaled, the smell evaporates, the colour and figure are destroyed, the size increases, it becomes liquified, and finally, emits no sound when struck.

What then do we know about this piece of wax? It is certainly

the same wax but it has changed. Can we claim that the wax is the same on the basis of our sense perceptions? Descartes thinks not since all the perceived qualities have changed. Perhaps, then, the wax was just a body which appears to have certain qualities at one time and others at another. This is the alternative which Descartes adheres to. Since these qualities change, they do not yield knowledge of the nature of wax; thus Descartes suggests that we leave these aside and see what remains. And what remains is nothing except a certain extended thing which is flexible and movable (HRI, 154).

Needless to say, this example has stimulated a great deal of controversy in Cartesian literature; however, for our purpose it is enough to understand, perhaps only in a general way, Descartes' analysis. What we know about this piece of wax, about material objects is that they are extended and capable of changing appearances. And it is not the changing qualities which constitute its nature but rather the fact that it occupies a certain space, for this, briefly, is what extension means. But this idea of an extended mobile thing is not conveyed to us through our sensations, only the actual changes are. At least, this is Descartes' reasoning when he rejects imagination as the source of this idea (HRI, 154-155). Thus Descartes concludes that it is the understanding alone which perceives the true nature of the wax. But what is this understanding if not an act of reflective consciousness. Descartes is aware of various sensations

arising from his observation of the wax. But awareness of the various changes themselves, since Descartes has no doubt that the wax remains the same, cause him to reflect that the nature of the wax is constituted by something else, by something not given in sensation but which would account for the sensations received from the wax. This something else is extension and it is known not directly by the senses but by reflection on the data provided by sensation.

Thus through an act of reflection, or through reflective consciousness, the mind comes to see that the wax is nothing but a flexible extended object. And this act of reflection is nothing other than the activity of mind alone, in that it is the mind itself which gives us the idea of extension and not the senses. It is the mind when reflecting on the various changes in the wax which intuits its nature as extension. Pure activity of the mind, or reflective consciousness, then, as a particular mode of thought has as its root not bodily impressions but the conscious activity of the mind itself. And this conscious activity gives to us the idea of extension.

But what is this "extension"? Let us examine it a little more fully.

> By extension we understand whatever has length, breadth, and depth, not inquiring whether it be a real body or merely space; nor does it appear to acquire further explanation, since there is nothing more easily perceived by our imagination (HRI, 57).

Any body which has length, breadth, or depth, is understood as extended. This appears to be the full meaning of the word "extension", as Descartes states that no further explanation is necessary. Yet, there are enough clues in Descartes' thought to construct a deeper understanding of the words "whatever has length, breadth, and depth". The reason why no further explanation is required is that the imagination requires no further details in order to easily frame this idea in the mind. However, contrary to the above statement that the understanding is the source of the idea of extension, it appears here as if Descartes is taking an opposite view in maintaining that it is the imagination which forms this idea. But let us recall that in the Rules (HRI, 39) Descartes holds the view that the imagination ought to aid the understanding in its reflections on material bodies. And the reason for this is that

> even though the understanding in the strict sense attends merely to what is signified by the name, the imagination nevertheless ought to fashion a correct image of the object, in order that the very understanding itself may be able to fix upon other features belonging to it that are not expressed by the name (HRI, 59).

The imagination in depicting images of bodies represents to the understanding a picture or image which enables the understanding to more fully grasp the features it is reflecting upon. Thus there is no real conflict in saying that the imagination perceives extended bodies and the understanding is that which grasps the nature of these bodies,

for the imagination constructs an image of extended body and the understanding is that which apprehends the image. And apparently, an image of something extended in length, breadth, and depth is adequate for the understanding to grasp fully the nature of material bodies. Thus no further detail in description is necessary. But why is this so?

The answer, I believe, is found in the following passage:

> it will be more expeditious for us to expound the way in which we assume our object should be taken, in order that we may easily give a proof of whatsoever is true in Arithmetic and Geometry.
>
> Here therefore we deal with an extended object, considering nothing at all involved in it save extension (HRI, 59-60).

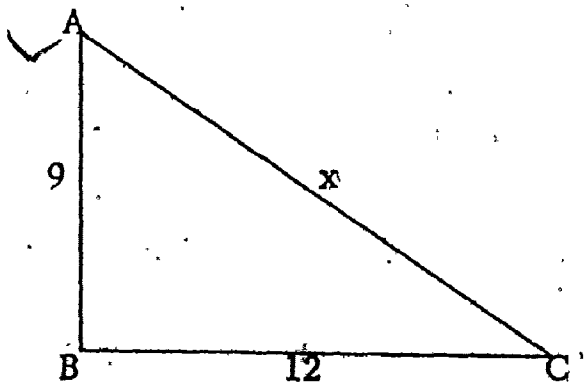
All we need to know is that material bodies are extended in order to show that Arithmetic and Geometry can be applied to them. Thus it would be Descartes' belief that Mathematics can apply to material bodies which shapes his idea of an adequate image of these.

> I would think I knew nothing in Physics [or about material bodies] if I could only say how things could be, without proving that they could not be otherwise. This is perfectly possible once one has reduced everything to laws of mathematics (Letters, 70-71).

Further evidence for this, that material bodies are to be reduced to suit the mathematical perspective, is contained in the text immediately succeeding the above passage from the Rules.

> We assume such a simplification of our problems as to leave nothing else to be inquired about except the determination of a certain extension by comparing it with a certain other extension that is already determinately known (HRI, 61).

Thus by considering only extension as pertaining to material bodies, Descartes is able to claim that all enquiries about material bodies can be satisfied mathematically, or reduced to mathematical demonstration, to the comparison of a "certain extension" to another "certain extension". Thus all knowledge of material bodies is mathematical in nature, or is knowledge of relations. And this knowledge is produced by comparisons between a known extension and an unknown extension. How this is possible is by paradoxically defining the unknown by means of specific conditions (HRI, 52). For instance, in the right-angled triangle ABC, where AB = 9 and BC = 12




and the problem is to discover the length of the hypotenuse AC, we treat the unknown as a known, that is assign it a value "x" and then by determining the ratio between these quantities one can determine the unknown. The ratio here is that $x = \sqrt{a^2+b^2}$, that is $x = \sqrt{9^2+12^2}$; thus $x = 15$.

This mathematical example illustrates exactly what Descartes means by comparing "certain extensions". It is clear that in this

mathematical illustration that which is to be compared poses no problem. But what is to be compared in extended objects if this method is to yield knowledge of the extended? Descartes gives us the answer - dimension.

> By dimension I understand nothing but the mode and aspect according to which a subject is considered to be measurable (HRI, 61).

"Dimension" refers to that aspect of extension which is measurable. Thus an extended body, in as much as it possesses the aspect of dimension, is a measurable body. Length, breadth, and depth are dimensions, as is weight (at least in the Rules) and speed (a dimension of motion), that is they all can be assigned a numerical value and thus be compared with each other. In this way material bodies can be mathematically treated. And thus it can be seen also that if one's intent is to reduce material bodies to the mathematical that only extension is necessary in order for the imagination to form a proper image of these. All it need do is to imagine a figure possessing length, breadth, and depth. so that the understanding can grasp the mathematical relations which characterize knowledge of material bodies.

It is not my intention to claim that Descartes consciously sets out to construct a concept of matter which makes it suitable for mathematical investigation, but rather, simply to suggest that such a concept is necessary in the development of a "Universal Mathematics", in the development of a general science of order and measurement in which it

makes no difference if the object of measurement be "numbers, figures, stars, sounds, or any other object" (HRI, 7).

What I have hoped to achieve in the above exposition is to indicate that Descartes' concept of material bodies as in nature possessing simple extension did not spring from nothing but was influenced by his desire to extend the science of order and measurement, i.e., mathematics, to all things which man may be aware of. And since mathematical reasoning is but a model for human reason, it follows that this concept of matter is but the product of the endeavor to bring the physical world under the sway of human reason.

Let us now turn to Descartes' actual description of material bodies. In The World, Descartes conceives of the matter in this world as:

> a true substance perfectly solid, which uniformly fills all the length, breadth, and depth of that great space, in the midst of which we have stayed our thought, so that each one of its particles always occupies a portion of that space so related to its magnitude that it could not fill a greater, nor contract itself into a less, nor allow, while it remains there, any other to enter it (Selections, 319).

The matter of Descartes' world is perfectly solid, not only in that it uniformly fills all space such that no vacuum, i.e., space with no substance is possible, but also in that each particle which occupies a portion of space is itself a solid which will admit no other particle to fill that same portion of space. The Cartesian world then is a solid

three-dimensional expanse. But if this is so, then how can Descartes account for the diversity of objects in the world? One explanation, which is offered in the Meteorology, is that these particles differ both in size and shape, and that different combinations of these account for different bodies (Olscamp, 263-268). However, this cannot give us a criterion to distinguish between objects, for these particles are imperceivable (Selections, 316), thus we would have no way of knowing which shapes account for which bodies. In fact, it has been argued by R. Catesby Taliaferro, The Concept of Matter in Descartes and Leibniz, that these particles are not to be identified as permanent atoms,[1] a position which Descartes himself gives weight to in Principle XX, Part II of the Principles. However, it should be noted that in the Meteorology it is apparent that Descartes intends these as constituent elements of the real world.

Regardless of the above difficulty, the more accepted account for the diversity of bodies is that which is provided by Principle XXIII, Part II of the Principles, wherein it is stated:

> That all the variety in matter, or all the diversity of its forms, depends on motion (HRI, 265).

How this is so, or can be so, is further explained in The World:

> let us suppose that the only distinction to be met with [in material bodies] consists in the variety of motions he [God] gives to them, in causing that, at the very instant they are created, some of them begin to move in one direction, others in another;

> some more swiftly, others more slowly (or, if you please, not at all), and that they continue thereafter their motions according to the ordinary laws of nature (Selections, 320).

If motion is the only distinction to be drawn between material bodies, then it must be their varying movements which account for the diversity of objects which we witness. It is difficult, though, to conceive of movement in a mass of solid bodies. Descartes does define "movement" as the transference of one part of matter from the "vicinity" of bodies in immediate contact to the "vicinity" of others (HRI, 266). However, as Kenny points out, if Descartes' theory of motion is correct, then no motion is possible, for if all movement is in a circle, which according to his interpretation of "motion" it must be, then the only moving bodies are circles or rings, thus no distinct objects would be discernible. [2]

Whether Kenny is correct or not, matter for Descartes is a three-dimensional expanse which has the qualities or attributes of figure and motion. And once we are able to discern these attributes of extended matter it then becomes possible to apply the "general science of measurement" to material bodies. For instance, to attribute figure, or shape, to an extended mass is nothing other than to conceive it as containing a certain length, breadth, and depth. And these as dimensions are expressible numerically. The same is true for motion, it too can be expressed mathematically. But motion, or

change, for Descartes can only be of one kind - extrinsic change, that is local motion, or change from place to place. This is adequately expounded by P. H. J. Hoenen, "Descartes's Mechanicism".[3] Intrinsic change is impossible for Descartes because his concept of matter as solid extended particles does not allow for change within each particle. For "all the properties which we can clearly perceive in it [matter] may be reduced to one, viz. that it can be divided, or moved according to its parts" (HRI, 265). Thus if all the properties of matter can be explained by local motion, by the movement of parts from vicinity to vicinity, intrinsic change in matter cannot be attributed to, or account for any changes which occur in matter.

But, while Hoenen seems to be right in his analysis of motion, and mechanicism, which is understood as the denial of intrinsic changeability and the restriction of activity in bodies to extrinsic local motion, doubt may still be raised with regard to his understanding of the basis of this view, which for Hoenen, and, incidentally, for the French commentator Gilson, is to be found in Descartes' rejection of the Peripatetic view, of the Aristotelian and Thomistic notions of substantial and accidental form. It is apparent that Descartes' view does constitute the rejection of such notions (Letters, 59, 61). But this seeming for a very good reason, as Descartes points out to Regius, January, 1642, and that is because reference to such notions is unnecessary, that material phenomena can be adequately explained, as illustrated in the Meteorology

without reference to such notions. Thus substantial and accidental form is to be rejected because in Descartes' scheme they are entirely useless. This at least is the impression which is given in Descartes' letter to Regius.

In summary, perhaps the best way to summarize Descartes' concept of matter and the material object is to think of matter as three-dimensional extension, and this as represented in Euclidean geometry, that is consisting essentially of what is measurable, with the modes of motion and figure[4] and the material body as a particular mass of matter exhibiting a distinct movement and figure. And furthermore; this conception is not to be regarded as a product of sensation, but as in origin derived from the mind's own conscious activity, from the reflections of the understanding and which is represented in the imagination as a figured image.

## 2. The Mind-Body Problem

For "mind" we now understand the thinking thing, or the source or center of awareness in man and for "material objects" certain discernible forms of solid matter, which possess figure by virtue of motion. But what is significant is that this idea of material bodies is formed by the understanding. With regard to matter in general, or to specific material bodies, the mind is also, through sensation, aware of certain sensible qualities such as heat, weight, colour, sound, etc.,

but given Descartes' Method, which dictates that true knowledge is acquired only by reason, or by the power of understanding, it follows that awareness of matter as extended body alone constitutes true knowledge of the material world.

Thus we have mind and matter. And what makes them separatable and distinct is that the concept of each excludes as part of its nature the concept of the other. It is the mind which knows matter but what it knows about its nature, and its own nature, excludes the possibility that these two natures are similar. There is no awareness in extended bodies, nor is awareness extended, for the nature of consciousness, or the conscious agent, is such that no extended component must be postulated in order to understand it (second Meditation).

Let us now turn to the prime concern of this thesis, the individual subject or person. My starting position here is that the person is one single identity. But let us see what Descartes does with the 'I', the person or subject of experience. First of all, from the second Meditation, it is apparent that the 'I' is identified with the thing which thinks ("But what then am I? A thing which thinks"). And this for two reasons. First, that the 'I' cannot be identified with the body and its attributes because Descartes is certain that the 'I' exists, whereas, the existence of the body, or of anything corporeal, on the basis of his analysis, is still uncertain. But the presence of thought cannot be doubted. Therefore, the 'I' and thought are conjoined, for Descartes can only

claim his existence on the basis that he is thinking. "I am, I exist, that is certain. But how often? Just when I think" (HRI, 151).

My existence then is tied to the fact that I am thinking. I am certain of my existence as that which thinks but uncertain of my existence as a corporeal body. Therefore, the conclusion to be drawn, which Descartes does draw, is that my thinking must be an expression of my nature. It is certainly true that I think, that I am conscious; thus, I can be certain of my existence as a conscious being. But what is not clear is that this entitles one to claim that therefore the 'I' is to be identified solely with the conscious agent. For Descartes, though, this is necessarily true, for he cannot identify the 'I' with what is uncertain, namely the body, and still claim to have certain knowledge of his nature. However, in the sixth Meditation Descartes does offer a proof for the existence of the body. And once its existence is established it is clear that the above line of reasoning will not hold. Yet the 'I' is still to be identified with the thinking thing, and this on the principle that Descartes possesses a clear and distinct idea of mind and body as distinct and as separate existents. This later claim is based on the omnipotence of God, in that he can create, or make true, all things that are apprehended clearly and distinctly (HRI, 190). Thus if mind and body are clearly and distinctly conceived, as separate, the grace of God insures that they are in nature, in the natural order of things, two separate substances. And this, that mind and body are

conceived of as separate rests on the foundation that once the body is granted existence it still is not to be considered as essential to my nature. But this, of course, assumes the argument of the second Meditation, that my nature is bound up with the thinking thing.

I, then, am a thing which thinks, this for Descartes, whether we deem it true or false, is beyond doubt. But what is also beyond doubt is that there is a connection between the mind and the body, that "a certain body is more closely united to our mind than any other" (HRI, 255). But before we examine Descartes' notion of the union between mind and body, let us first turn to his description of the body, so that we will be able to discern exactly what it is that the thinking thing is conjoined to. It is curious, that of all things, which Descartes doubts, the nature of the human body is not one of them. Certainly, he throws doubt upon its existence, but if it does exist, as to its nature there is no question.

> By the body I understand all that which can be defined by a certain figure: something which can be confined in a certain place, and which can fill a given space in such a way that every other body will be excluded from it;...

The human body is a solid, spatially located mass of matter, that is it is an extended object, and is outlined, or characterized by a certain figure.

> ... which can be perceived either by touch, or by sight, or by hearing, or by taste, or by smell: ...

Awareness of the body occurs through sensation, by means of the various senses.

> ... which can be moved in many ways not, in truth, by itself, but by something which is foreign to it, by which it is touched [and from which it receives impressions]: ...

Like all material bodies, the human body, although not self-moving, is capable of movement when impelled by some external body. Here, Descartes is possibly thinking of the body as a mechanism, or machine, which is stimulated to move, to act, by the influence of outside objects. For instance, any reflex reaction, say, the rapid movement of the hand away from a hot stove, would serve as an illustration of what Descartes means by movement stimulated by foreign bodies. And finally:

> ... for to have the power of self-movement, as also feeling or of thinking, I did not consider to appertain to the nature of body: on the contrary, I was rather astonished to find that faculties similar to them existed in some bodies (HRI, 151).

The final remark is an obvious reference to animals, but let us leave this aside, for although Descartes' discussions on animals are interesting, and indeed controversial, to follow them here may lead us away from our objective. The last point to be made is that the human body as a particularly figured, extended mass of matter cannot, or is not capable of thought or feeling, for these as cognitive components, or natures, pertain to the mind only.

This unthinking mass of solid matter, then, is the body to which the mind is to be conjoined, once it is demonstrated that it does exist in nature as described. Let us turn now to Descartes' grounds for asserting a union between mind and body. And these, I think, become evident if one first examines Descartes' proof for the existence of material bodies (HRI, 190-191).

I am a thinking thing, but as a thinking thing I am aware of particular modes of thought, i.e., sense perceptions, imagination, feeling, which reside in me. Perception, as a mode of thought, is passive, that is sensual awareness occurs only when something sensible draws my attention. Thus, for me to receive sense impressions it is necessary that my awareness have some cause. This cause, Descartes argues, cannot reside in me, nor is it internal to my nature, for such impressions are often produced against my will. Thus because I have no control over these impressions, Descartes concludes that they must originate in some substance other than myself. And here there are two possibilities - material objects, which formally contain that which is objectively in sense impressions, or God. The two terms "formal" and "objective", as Descartes uses them, present difficult problems when attempting to give clear meaning to them. Generally, what is objective in any idea, or in the form of any thought, is that which is perceived as being in the object of our idea, that which is perceived in the actual impression. And what is formally contained in any idea

is that which exists as the cause of what is objective and is exactly like it (HRI, 162; HRII, 52-53).

Having previously drawn the conclusion that God exists and is no deceiver (third Meditation), Descartes on this basis argues that ideas of perception are caused by actually existing corporeal objects, which contain formally what is objectively represented in these ideas. And this because God would not deceive me into thinking that these ideas are caused by something which does not formally contain their objective realization. In other words, because Descartes is inclined to believe that sense impressions are caused by corporeal objects, which contain formally their reality, they, corporeal bodies, must be real and this because God as a non-deceiver would not allow it to be any other way. Thus corporeal things must exist.

From awareness of sensible impressions, Descartes argues, via the veracity of God to the existence of material bodies. And similarly, through awareness to sensations, or bodily impressions, Descartes argues that body and mind are conjoined.

> Nature also teaches me by these sensations of pain, hunger, thirst, etc., that I am not only lodged in my body as a pilot in a vessel, but that I am very closely united to it, and so to speak so intermingled with it that I seem to compose with it one whole (HRI, 192).

First, let us clarify the nature of the union. From this passage, it appears to be a union of part to whole, mind and body are two parts

which seem to form a whole. And this is known by us as a teaching of nature. "Nature" Descartes defines as "no other thing than either God himself or else the order and disposition which God has established in created things" (HRI, 192). Thus, through God or the order he has created we come to know that body and mind are united. For sensation is a particular, and for Descartes a confused mode of thought which arises out of the union of mind and body and is defined as the "diverse affections of our mind", or thoughts that immediately arise from the movements excited in the brain by nerves stimulated by bodily movements (HRI, 289). Because I feel particular sensations, pain, hunger, thirst, it follows, since sensation itself is possible only if bodily movements cause awareness in the mind, that mind and body must be connected. From the effect, sensation, Descartes argues back to the cause, the union of mind and body. Without this union no sensations would be possible. Yet, I do have sensations; hence mind and body are conjoined, not contingently as a pilot in a ship but essentially as two necessary links in the chain of experience. Sensual experiences necessitate that mind and body are intimately united.

But one may ask if this has not been the case from the very beginning, that this union has been presupposed by Descartes prior to his presentation of this argument. For instance, to argue for the existence of corporeal objects on the basis of sense perception, presupposes a connection between corporeal objects and the mind. To

conclude on the basis of one's awareness of sense objects, the existence of material bodies, necessitates the mind-body union, for without this union no awareness of corporeal bodies is possible. Thus the union of mind and body is a necessary presupposition in the argument for the existence of material bodies. And also in sensation, one must assume that mind and body are connected prior to proposing sensation as the proof of the mind-body union. In this latter case, though, our assumption is substantiated, in that sensation does provide the groundwork for the claim that mind and body are united.

Within the context of knowledge, we know that mind and body are united because our sense experiences necessitate such a union. However, Keeling seems to feel that this union is "intuitively disclosed" - that it is a fact having its place among simple natures.[5] It is possible that knowledge of this union is intuitive, in that we immediately recognize it as certain, as beyond doubt when the mind reflects on the causes of its sense perceptions. But it is extremely doubtful that this union is a "fact among simple natures". In support of this claim, Keeling refers to Descartes' letter to Elizabeth, 21, May, 1643 (Letters, 138), in which he places the union of the soul and body in a list of "primitive notions" (i.e., simple natures). However, Keeling admits, and rightly so, that this placement does present problems.[6] Descartes does set the matter straight, though, in his next letter to Elizabeth (28, June, 1643). The primitive notions of mind and of body are conceived of by the

understanding, although the latter is conceived much more clearly when the imagination aids the understanding. But the notion of the union of mind and body:

> can be known only obscurely by pure intellect or by intellect aided by imagination, but it can be known very clearly by the senses (Letters, 141).

Thus it is only through the senses, on the basis of my sensual experiences that knowledge of the union of mind and body is possible. And this strictly speaking would not make this notion a fact among simple natures, for the simples of our knowledge are conceived of only by the understanding. But many problems arise with regard to Descartes' claim that the senses provided a reliable means to knowledge. For instance at the beginning of the Meditations, or for that matter in the very Method itself, Descartes obviously rejects knowledge gained by sensation, or sense perception as inadequate. On what basis then can he now claim that such knowledge is reliable? First, it is evident that in the sixth Meditation such knowledge must indeed be reliable.

What makes this claim possible for Descartes is that once knowledge of God is secured, the order which God has established in those things that he creates (i.e., the natural world), or in other words nature, receives sanction as adequate grounds for knowledge. Nature teaches us that mind and body are conjoined, for feelings of hunger, thirst, pain, etc., can only be present in one if I am attached to a body.

The argument: I have sensations, therefore I have a body, is conclusive then on the grounds that God has established the order in natural objects by which I am affected and thus experience sensations. This "nature" or the order of God is a very wide concept, but let us reduce it to a specific reference or arrangement. It is clear that the kind of arrangement in created things on which Descartes rests his argument is one of a causal nature. Sensations, or awareness of sense objects is produced by the interaction of mind and body. Material bodies cause movements in the human body, i.e., the movement of animal spirits in the nerves, and these in turn affect the pineal gland, which as the seat of the soul, in some unknown way moves the soul, thus, results awareness of the object which caused the chain of movements. Thus, nature, or more specifically, the principle of causality is the ground upon which we come to know that the mind and body are united.

But in this a further problem arises and that is how a causal connection between two distinct natures is possible. For the intellect teaches us that mind and body are distinct natures; thus, it would wonder how it is possible that two distinct natures can causally interact, how movements in three-dimensional extended objects affect cognitive apprehension. Thus the intellect reflecting on this notion of union would be led to the conclusion that two such substances could not in fact enter into this type of relationship. And Descartes, at times, seems to uphold such a conclusion. In a letter to de Launay, 22, July,

1641,* Descartes states that things are separated either by an act of abstraction, in which case their conjunction can be noted when such things so separated are considered together, or because they are truly distinct. In this instance, as in the case of body and soul:

> you cannot see any such connection, provided that you conceive them as they should be conceived, the one as that which fills space, the other as that which thinks. Indeed after the idea we have of God ... I do not know any other pair of ideas in nature which are as different from each other as these (Letters, 109).

This theme that mind and body are truly distinct and that no connection can be drawn between them is again elaborated by Descartes in his Conversation with Burman, wherein he states that corporeal substance and thinking substance are clearly conceived as two substances which do not entail one another and which are actually incompatible (CB, 28).

Thus there appears to be a tension in Descartes' thought on this matter. What reason conceives of as distinct and incompatible, nature teaches us as conjoined. But let us dwell on the distinction between mind and body for a moment. In the second Meditation, Descartes defines the thinking thing in such a way that the body is excluded as part of its nature, in other words, the thinking thing does not require

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*Kenny notes that both the dates and addressee in this letter are uncertain.

the body in order to think, for though no bodies may exist, the very process of doubt in that it is an act of reflective thought signifies that thought, pure reflective thought, need not depend on awareness of bodies. However, Descartes warns us that we should not conclude on the basis of the second Meditation that mind and body are distinct. From the letter to Mersenne, 24, December, 1640:

> You should not find it strange, either, that I do not prove in my second Meditation that the soul is really distinct from the body, but merely show how to conceive it without the body. This because I do not yet have, at that point, the premises needed for the conclusion. You find it later on, in the sixth Meditation (Letters, 87).

Thus the whole point of the second Meditation is merely to show how to conceive of the mind, of conscious activity as pure reflective activity, without the influence of body. Of course, more than this transpires in the course of this Meditation, for instance, that the essential nature of man, of the 'I' which exists, is shown to be bound to the thinking thing. And also by showing how to conceive of mind as separate from the body, Descartes has already laid down the foundations for proving that they really are distinct; if, supposing that it was impossible for Descartes to conceive of these as separate, then, no argument could be developed to show that they are really distinct. But to show that mind and body are truly distinct requires as a prerequisite that material bodies in general, and the human body in particular, be granted status as existing objects in the natural world. This is why

proof of the distinction must wait until the sixth Meditation. And true to his design the title to this Meditation does promise a "real distinction between the Soul and Body of Man". However, what is delivered is a "great difference" rather than a "real distinction". But this may be enough.

> In order to begin this examination [that the nature of man can sometimes be a source of deception] then, I here say, in the first place, that there is a great difference betwwen mind and body, inasmuch as body is by nature always divisible, and the mind is entirely indivisible (HRI, 196).

The most essential feature of extension is dimension, that is, it is available as something to be measured. The extended body possesses length, breadth, and depth. These dimensions can be divided, added, broken into parts, etc. Thus the body as an extended figure is divisible. But the mind is indivisible in that it possesses no dimensions; thus, it cannot be measured, or reduced to the science of measurement. We can see then that this "great difference" does signify a real distinction between the concepts of the mind and the body. The body is an extended object, that is it fills space, possesses measurable dimensions; thus, its properties can be mathematically computed. Mind, on the other hand, is pure thought, it fills no space, possesses no dimensions, and is mathematically unanalyzable. What remains is to prove that this difference in conception constitutes a real distinction between two existing substances, and this is proven on the basis that

God can, or does, create things as we clearly and distinctly perceive them to be (HRI, 190). Thus mind and body are, or exist, in nature as two separate distinct substances.

Are we then to reason that no union is possible between mind and body? Let us consider what type of connections can be drawn between these two natures. In the doctrine of simple natures, Rule XII, Descartes states that union of simples can be either necessary or contingent (HRI, 42). A necessary union is present when the concept of both natures seem to imply each other, that is when neither can be conceived distinct in isolation.

But are thought and extension to be conceived of as simples? The only reason for not conceiving them as such, since they are so characterized in the Rules, is that Descartes does not specifically refer to them as such in his later works. He does refer to them as "substance" rather than "simple nature", but, "substance" is defined as "nothing else than a thing which so exists that it needs no other thing in order to exist" (HRI, 239) and is this not the equivalent in the order of nature to that which is so distinct that it cannot be analysed into anything more distinct, that is to the "simple" in the order of knowledge? "Simple" and "substance" refer to the same thing, only the point of reference differs.

Thought and extension, then, as simples, the former intellectual and the latter material, cannot form a necessary union, for they

are capable of being conceived clearly and distinctly, one separate from the other. However, their union may be contingent, for a contingent union is one wherein the simples are conjoined "by no inseparable bond" (HRI, 43) that is that the simples in a contingent union can be separate and distinct and still form a union, though be it a union which possesses no necessary connection between its mates, for instance, clothes and men. But this is clearly inadequate in that the union in man appears to be more intimate than that between man and his clothes, for if contingent union such as men and clothes is analogous, to the mind-body union, then this is equivalent to saying that man is simply a mind with a body affixed to it, and this for no necessary reason. But, in turn, this may be what Descartes has in mind when he thinks of himself as an 'I', a thinking thing, which has, or possesses a body. However, in his letter to Regius, December, 1641, Descartes explicitly denies that man is an "ens per acciden", that the union of body and mind is not purely accidental (Letters, 121). Thus it would seem that Descartes does not seriously consider that the union of mind and body is contingent.

But if the union between mind and body is not to be considered as contingent, and if it is impossible to conceive it as necessary, although from the perspective of our experience of material objects it may appear as necessary, then clearly one cannot reason that body and mind are in any way united. Yet, we are left with the alternative

view that mind and body are united, and this on the basis of our sense experience. Which of these views are we to accept? Are we to conclude along with Beck,[7] that no problem of unity or interaction is present because Descartes maintains that this union is a fact of experience?

If we accept this view then we are left to face the following problems. The first is that the various analogies Descartes employs to illustrate the union of mind and body - gravity to a stone (HRII, 84), hand to the rest of the body (HRII, 99), and bones and flesh of the same animal (HRII, 242), all fail to illuminate the nature of the union between mind and body, and this principally because all of the above items, except the first, indicate a union between two things of the same nature. The first analogy tends to reduce one component to a quality of a substance and thus must also be rejected because in mind-body we are dealing with two substances and not a quality and substance.

And secondly, if we accept sensation, or our sense experiences as the basis of our knowing that a union does exist, then we are still left with the problem of how interaction and union is possible given, one, the radical distinction between mind and body and, two, Descartes' concept of causality, that there must be as much reality in the efficient and total cause as in the effect. In other words, what is found in the effect must be produced by and exist first in the cause. It is clear that on this principle there can be no causal connection between mind and body, for what is found in the effect, awareness of something

sensual, does not first exist in the cause, movements of material bodies.

Thus, although experience may dictate an intimate union between mind and body, reason, the instrument of true, certain knowledge, will not be silenced. But to accept the dictate of reason, that mind and body are distinct and separatable is in turn to neglect that experience does necessitate a union in that modes of thought such as sensation are possible only if a union between mind and body exists. Perhaps then, the only thing for certain in Descartes' discussions of mind and body is, as expressed to Elizabeth, 28 June, 1643, that:

> Everyone feels that he is a single person with both body and thought so related by nature that the thought can move the body and feel the things which happen to it (Letters, 142).

The only certainty then is that mind and body are related. But at this point, one comes to the formulation of the mind-body problem - and that is, how to explain satisfactorily the nature of this union, given that mind and body are to be conceived as radically different in nature. In all fairness, this problem cannot be cited as in any sense an official doctrine in the writings of Descartes, but as a perplexity which arises out of Descartes' unsatisfactory account of this union.

### 3. Concluding Argument

With the problem thus before us, let us now turn to examine

its foundations. I will purposely avoid any detailed discussion of a solution to this problem, for my aim is to grasp the nature of the problem rather than provide an adequate solution. It is evident that the problem of unity and interaction arises from Descartes' radical separation of body and mind. Let us discern why this separation was necessary. Perhaps, the best approach is to follow Descartes' own procedure as outlined in the Method, and that is in any problem, analyze the complex into its simpler components. The problem before us is the nature of man. The answer, in Descartes' view, is that man is a union of mind and body, though his essential nature is spiritual rather than physical. The steps necessary to arrive at this conclusion are fairly straightforward. In the second Meditation, after certainty of his own existence is secured, Descartes then turns to consider the nature of this 'I' which exists. His analysis proceeds on the basis that the subject, the 'I' is reduced to two possible natures - mind and body. Body is rejected as essential to the subject, while mind is maintained as essential. Thus, methodogically, the complex, man, is divided into two simpler components. At this stage the division has already occurred. Man is essentially mind, or a thinking thing. What remains, to conclude the argument, is presented in the sixth Meditation, wherein, body and mind are shown to be truly distinct in nature, because they can be so conceived, and that a union does exist between them, albeit that the notion of this union is supported on

grounds which constitute a departure from strict adherence to the Method, to reason itself.

Thus from a methodological perspective, the separation of man into mind and body is a necessary consequence of Descartes' approach to knowledge. It is because Method requires analysis into simpler components that the dualism of mind and body emerges. If Descartes' Method had been different, if he had followed the Scholastics and defined man as a "rational animal", then the categories of mind and body would not have developed as a necessary consequence of Descartes' mode of enquiry. Method requires that the simplest components be isolated in any enquiry. If mind and body are the simplest components in man, if they cannot be reduced to something more simple, then, necessarily it follows that they are diverse in nature. It will not do to object that because we can conceive of these as distinct natures, that this does not necessarily lead to the conclusion that they are in reality two diverse natures. For it is clear that awareness of objects is awareness of objects as they are in nature; the simples which we are aware of are not only concepts in the mind but constitute in nature the very essence of objects, i.e., extension is not just a simple nature but is in nature, in the order of created things sanctioned by God, the essence of material bodies. There is no difference between the simple, extension, and the extended object, and between thought and the thinking thing. And this because of the

veracity of God.

> And first of all, because I know that all things which I apprehend clearly and distinctly can be created by God as I apprehend them, it suffices that I am able to apprehend one thing apart from another clearly and distinctly in order to be certain that the one is different from the other, since they may be made to exist in separation at least by the omnipotence of God (HRI, 190).

That all things exist as apprehended, when this apprehension is clear and distinct is the salient point which the Meditations as a whole is constructed to prove. Physics as a rational enquiry yields knowledge of material bodies, but reason apprehends bodies as extended nature. This, if permissible, is the presupposition upon which Descartes' physical theories operate. But to validate his physics, to show that the knowledge reason acquires is knowledge of natural bodies, bodies existing in the world, it is necessary to prove metaphysically, that is to prove by reasons which extend beyond the physical, that bodies exist in nature as essentially extended objects. And this is the objective of the Meditations, as a whole, and of the sixth in particular.

It follows from this that if we conceive of mind and body clearly and distinctly as separate simples in the complex identity known as man, then they must exist as conceived and this by the omnipotence of God. Thus because we conceive of body and mind as distinct, it follows that they really are distinct. In this way we can see how Descartes'

methodology leads to the conclusion that mind and body are essentially two separate natures, for analysis dictates that we search for the "simples" in any complexity and once these simples are found, because they must be comprehended as distinct and therefore also clear, in order that they be simples, the appeal to God who insures that what is comprehended clearly and distinctly does in fact exist in nature as comprehended seals the argument that mind and body are truly distinct.

But the one factor which is missing in the above explanation, the one factor which has yet to be accounted for is why the simples, thought and extension, must be postulated as those which constitute the nature of man. The Method to be followed in one's reasoning is itself more than just a procedure which requires that analysis be performed. Along with the procedure Method, or reason, carries with it a presupposition about the nature of its objects. The question: why the simples of mind and body are necessary to fully account for the nature of man, must have its answer in reason's concept of its object, or more particularly, as I shall maintain, in the concept of matter which reason gives to us.

The substance which composes the physical world, the universe, is matter, or extension, and this is conceived by Descartes as perfectly solid. The physical world is comprised of particles extended in length, breadth, and depth, and these completely occupy all space. And as one homogeneous mass of extended particles, the physical world

has as one of its features a particular mass of particles entitled the human body. And this material object, as extension, possesses no other attributes than length, breadth and depth. It does not possess such qualities as heat or cold, dry or wet, light or heavy, or taste, odour, sound, colour, light, etc., for these are not properties of matter (Selections, 319) but are caused by the movements of extended particles. Heat is caused by rapid movements of particles in a flame, taste by the movements of particles in the mouth, smell by movements in the nostrils, and so on (HRI, 292-293). And furthermore, we have previously witnessed that the very shapes and figures manifested in the material world are also the result of particles in motion. Thus in the material world there exists nothing but extended particles in motion.

Now, let us suppose, that someone fully aware of matter as so described comes to analyze the problem of man's nature. He can see, first, that man has a body, an extended mass of particles and, secondly, that man is affected by the movements of other bodies. He feels pain when struck, is burnt when he approaches too close to a flame, witnesses colours, smells, senses heat and cold, etc. But at this point, our hypothetical analyzer comes to the realization that man must possess more than just a body, for if man is just a body then he cannot account for the fact that he experiences certain sensual impressions, such as those just enumerated. Our analyzer must then stop for a moment and ponder: if I am only a body and body is simply extended

particles, then how is it that I can feel these effects, or for that matter, how is it that I can even think of myself as feeling such effects? The obvious conclusion that he would draw is that there must be something else in man to make this possible, something that thinks, or makes him aware of himself and the world he perceives. But this something which thinks cannot be an attribute of matter, for matter is simply extended particles in motion, and extended particles only move, they do not experience. Thus on the basis of his preconceived notion of matter, our analyzer must conclude that man is composed of two natures - thought and extended body.

I am not suggesting in any way that this is how Descartes came to the realization that man is composed of two distinct natures. But the logic in the above hypothetical analysis is, I believe, the same as that which would have led Descartes to this realization.

In The World, Chapter VI, which is the partial basis for the above sketch of the physical world, Descartes, in defining matter attributes to it a nature "in which there is nothing at all that anyone cannot know as perfectly as possible" (Selections, 319). We have previously witnessed, in the second section of this chapter, that what is essential about Descartes' concept of matter is its adaptability to the general science of measurement (Mathematics) and that all that is required to understand extension or extended objects, is that it has dimensions which are easily measured. Now, what else could be

more perfectly known; in such a concept there is nothing that cannot be grasped by anyone.

Extended bodies are spatially located measured objects. But what of particular qualities such as taste, sounds, smells, or even thoughts? These are not extended nor measurable. Thus, when coming to analyze the nature of man, Descartes is necessarily led to believe that because man has sensations and thoughts that these, because they are non-extended, non-measurable, must be different in nature from his body. Thus, on the basis that his concept of body excludes all forms of awareness, it necessarily follows that Descartes must analyze man into two distinct natures. And because man is a cognitive being and not simply a body, for this reason, mind and body are necessary for our understanding of man. Descartes' methodological procedure requires that the complex be reduced to its simpler components. But his concept of matter makes it necessary to isolate the conscious aspect of man from his physical presence. Thus, mind and body must emerge as the two natures which comprise man.

In conclusion, we can see what led to our dualist concept of man. First, there is the fact, and this is self-evident, that in man there is awareness or consciousness, or thought, and secondly, the fact of his physical presence as a body among other bodies. But why the dualism of mind and body arises is because, given Descartes' concept of matter, the cognitive aspect of man cannot be accommodated

as a part of the material world. Therefore, it must necessarily be conceived of as a distinct substance. And the reason for this, for the necessity of dual natures, is to be found in Descartes' desire to extend the mathematical method to all things that man is conscious of, to make all knowledge rational, including knowledge of metaphysical principles such as the nature of the soul.

Not only does mathematical reasoning provide the model for Descartes' Method, it also, and this may be more crucial, presupposes a uniformity in the objects it treats. Mathematics has as its object simple tangible facts, identities, or numbers, and what it proceeds to do is to compare, or discover relationships between these. And this, basically, is also Descartes' methodology, to compare and discover relationships between simples, not only material simples but intellectual simples as well. But let us see what happens when this method is made the basis of our knowledge of the natural world. For the mathematical mode of reasoning to discover relationships between physical objects, it must presuppose that these objects be accessible to order and measurement. And this Descartes achieves by characterizing extension as measurable dimension, possessing length, breadth, and depth. But in this whole approach what is excluded from the natural world is the thinking agent himself, the very one who reasons that the world is of such a nature. The thinking agent is not strictly "mathematical", but it is by virtue of the same rationalistic

method that Descartes asserts it, for the thinking subject is the necessary simple which must be postulated as agent of mathematical reasoning. Thus, at rock bottom, Descartes' dualism springs from the spirit of geometry, from the spirit of mathematical investigation, from the spirit of reason itself. Reason gives to us a concept of matter guaranteed sound by God in that he creates the world as conceived and which excludes in its nature the very process which discerns it. And thus it is reason which gives to us the concept of mind as something distinct from the material body.

William C. Springer, "The Birth of Dualism Out of the Spirit of Geometry",[8] as is apparent from his title, also traces the rise of dualism to the spirit of geometry. However, we differ in that, for Springer, this spirit is defined as that which compels us to maintain that anything factual must be located spatially; whereas, I have shifted the emphases towards the measurable dimension aspect of geometry. Certainly, these amount to the same thing in that what is measurable is spatially located. Still, I have followed a different course than Springer in developing my thesis specifically from the writings of Descartes.

My claim, then, is that what led Descartes to the formulation of his dualism of mind and body was his desire to shape all knowledge on the model of mathematical reasoning. And what led to the mind-body problem was his failure to reconcile these two natures within the

unity of man once separation has occurred. Wherein, then, lies the solution to the mind-body question, to the problem of the apparent unity of man? If this paper has contributed to an answer, its significance lies in its statement of the factors which led to the problem.

If mind and body are irreconcilable within the unity of men, which I suspect they are, one ought to look at our reasons for thinking these as different natures. For the problem may lie in our very conception of these as different, in the very concept of body as unthinking spatial extension, for it is this very idea which leads to the necessity of a dualistic position. Thus, in the final analysis, what may be required is a redefinition of matter, the working out of a new definition which would not exclude the thinking agent as a part of its nature. But here, at this time, I can only indicate one possible direction, and perhaps the only possible direction, which our thoughts should take if man's nature as an individual thing is to be fully understood.

If the unity of man cannot be satisfactorily accounted for within a dualism of mind and body, then, perhaps, this dualism itself must be swept away and a new approach cultivated. One in which mind and body are not conceived of as two different natures. And such an approach would from the outset require the rejection of "extension" and of the mathematical model which led to its formulation.

# NOTES

## INTRODUCTION

[1]Anthony Quinton, The Nature of Things (London, 1973), 314.

## CHAPTER I

[1]S. V. Keeling, Descartes (Oxford, 1968), 53. It may be added that the curriculum consisted of the texts of Aristotle along with the commentaries, in particular Aquinas', which were prevalent at that time.

[2]M. De Wulf, History of Medieval Philosophy, trans. P. Coffey (London, 1909), 101-117.

[3]Richard H. Popkins, The History of Scepticism from Erasmus to Descartes (Arsen, 1964), 15.

[4]Ibid., 18.

[5]Ibid., 17.

[6]See Montaigne's comparison between man and animals. Essays, Book II, Chapter XII, Florio trans. (New York, 1933), 399-427.

[7]Ibid., 519.

[8]Ibid., 531.

[9]For an outline of Sextus' method and philosophy, see Jason C. Saunders, Greek and Roman Philosophy after Aristotle (New York, 1966), 152-182.

[10]Montaigne, Essays, 536. Here again the method of comparison is used to illustrate the contradictions of sense experience.

[11]Ibid., 540.

[12]Popkins, History of Scepticism, 53.

[13]Ibid.

[14]For a brief history of the development of science, see Florian Cajori, A History of Physics, Revised, (New York, 1927).

[15]Keeling, Descartes, 33.

[16]E. A. Burtt, The Metaphysical Foundations of Modern Science, Revised, (Garden City, 1932).

[17]E. A. Burtt, Metaphysical Foundations, 38. Bernard Cohen, The Birth of a New Physics (Garden City, 1960), 57-61. Cohen disagrees with Burtt, the Coperican system was not a great simplification in his view.

[18]Cohen, The Birth of a New Physics, 53-54. Here an example of Copernicus' method is given.

[19]From Opera Complete di Galileo Galilei (Feringe, 1842), Vol. IV, p. 171. Quoted by Burtt, p. 75.

[20]Popkin, A History of Scepticism, 177.

[21]Ibid., 179.

[22]Ibid., 184.

## CHAPTER II

[1]See Keeling, Descartes, 58, for a discussion of Descartes' use of the term "philosophy".

[2]L. J. Beck, The Method of Descartes (Oxford, 1952), 52. For a full analysis of "intuition", see his discussion on pp. 47-64.

[3]John Morris, "Descartes' Natural Light", J. Hist. of Phil., 11 (1973), 169-172.

[4]Peter A. Schouls, "An Incapacitating Presupposition of Rationalism", Phil. Reform. 40 (1975), 40.

[5]Beck, The Method of Descartes, 16.

[6]Norman Kemp Smith, New Studies in the Philosophy of Descartes (London, 1952), 74.

[7]John Morris, ibid., 175.

[8]For a more elaborate discussion of this point, see Beck, ibid., 87-93 or Smith, ibid., 70.

[9]Smith, New Studies, 63.

[10]Brian E. O'Neil, "Cartesian Simple Natures", J. Hist. of Phil. 10 (April 1972), 161-179.

[11]O'Neil, ibid., 168.

[12]There is no question that this identification of extension and extended thing adequately expresses Descartes' thought. But one must be careful not to draw the same parallel between geometry which gives to us the concept of extension and physics which deals with extended things. These are two distinct disciplines. It is because the geometric method is applied to physics that the identification of extension and extended thing occurs. But one should not allow this application to pass unnoticed, that is without critical comment, as R. Catesby Taliaferro, The Concept of Matter in Descartes and Leibniz does, for this application is not only essential to Descartes' concept of matter, but as we shall see later, it is the same concept of matter, as extension, which constitutes the key to the difficulty known as the mind-body problem.

[13]Peter A. Schouls, "Descartes and the autonomy of Reason", J. Hist. of Phil. 10 (1972), 311.

[14]Schouls, ibid., 308.

[15]For instance, see A.K. Stout, "The Basis of Knowledge in Descartes" and Harry G. Frankfurt, "Descartes' Validation of Reason". Both in Willis Doney, Descartes (Notre Dame, 1967). And also the above article by Peter A. Schouls.

[16]A.E. Keaton, "Descartes' Method", SW J. Phil. 5 (1974), 89-94.

[17]Beck, The Method of Descartes, 287-307. My analysis in essence agrees with Beck's.

CHAPTER III

[1]R. Catesby Taliaferro, The Concept of Matter in Descartes and Leibniz (Notre Dame, 1964), 3-7.

[2]Anthony Kenny, Descartes (New York, 1968), 214-215.

[3]P. H. J. Hoenen, S. J., "Descartes's Mechanicism" in Willis Doney, Descartes, 353-368.

[4]Taliaferro, ibid., 3.

[5]Keeling, Descartes, 155.

[6]Ibid., ff. 155-156.

[7]L. J. Beck, The Metaphysics of Descartes (Oxford, 1965), 269-276.

[8]William C. Springer, "The Birth of Dualism Out of the Spirit of Geometry", SW J. Phil. 6 (1975), 71-78.

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