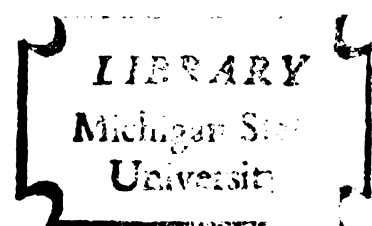


TYPES OF CERTAINTY
IN THE FOUNDATIONS OF THE SCIENCES
IN THE PHILOSOPHY OF RENE DESCARTES

Thesis for the Degree of Ph. D.
MICHIGAN STATE UNIVERSITY
John M. Morris
1968



This is to certify that the

thesis entitled

TYPES OF CERTAINTY
IN THE FOUNDATIONS OF THE SCIENCES
IN THE PHILOSOPHY OF RENE DESCARTES

presented by

John M. Morris

has been accepted towards fulfillment
of the requirements for

Ph.D degree in Philosophy

Rhoda H. Kotz

Major professor

Date June 7, 1968

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ABSTRACT

TYPES OF CERTAINTY IN THE FOUNDATIONS OF THE SCIENCES IN THE PHILOSOPHY OF RENE DESCARTES

By

John M. Morris

Several levels of certainty in the writings of René Descartes may be distinguished. Each level depends upon those which precede it.

At the level of greatest certainty are those truths which cannot be falsified by any sceptical hypothesis, such as the hypothesis of the evil genius. These include the axioms or common notions, which are recognized by the natural light.

The natural light is not identical with reason or intuition. It is the mind's power of recognizing truth and falsehood, which is distinguished from the power of conceiving. Nothing which is recognized by the natural light can be subject to doubt.

The common notions are said to be simple relationships among simple concepts. The most important of these are the causal principles upon which the proof of the existence and veracity of God is based. This proof is not viciously circular, because it does not require prior knowledge of the existence of God.

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The eternal truths constitute a second set of certainties, which depend upon knowledge that God exists and is not a deceiver. These include the truths of mathematics and Cartesian physics, which must be shown to conform to their objects.

Errors of judgment are the result of man's will, which can act in the absence of complete information. For Descartes, a serious unsolved problem was that of absolving God from blame for man's errors.

Moral certainties and probable knowledge constitute another level of certainty. Descartes gives two analyses of this level. In the earlier works, the method of enumeration requires the listing of all combinations of simple entities, from which all but one are eliminated. In the later works, an artificial language is proposed, and scientific explanation is shown to consist in providing translations from ordinary language into statements which use only clear and distinct concepts.

There are historical precedents for Descartes' use of a somewhat idiosyncratic terminology. Raymond Lull, Pierre d'Ailly, and Herbert of Cherbury are among those who relied on the method of enumeration, the natural light, and common notions, respectively.

A number of computer-generated indexes and concordances were used in the preparation of the thesis.

TYPES OF CERTAINTY
IN THE FOUNDATIONS OF THE SCIENCES
IN THE PHILOSOPHY OF RENE DESCARTES

By
John M. Morris

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Philosophy

1968

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PREFACE

One of the purposes of this thesis is to attempt to clarify Descartes' concepts of certainty and error, together with the theory of the mind with which they are associated. This has required a distinction among the various powers or faculties of the mind, to which I have attached English terms which are supposed to correspond fairly well to the Latin and French terms that Descartes used. Readers who are familiar with other translations may find that this procedure gives a strange sound to well-known passages in Descartes' works. For example, I have used "power of recognizing," rather than the more familiar "power of knowledge," to translate Descartes' "vis cognoscens" or "puissance de connaître" both because it seems to me to come closer to Descartes' meaning, and because the English term is a cognate of the Latin and French terms. ("Cognizing" would probably have come even closer, but I found the word both ugly and unfamiliar.) Any attempt to translate a technical vocabulary from one language into another requires some compromises, and I hope that mine are justified by my particular purposes.

I have relied most heavily upon Ferdinand Alquié's modern French edition of Descartes' Oeuvres philosophiques (OP) together with a number of modern English and French

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editions of various works. Pagination has been referred, however, to the standard edition of Descartes' works edited by Adam and Tannery (AT) for convenience in citation and reference.

A list of short titles of Descartes' works and of abbreviations is given as an appendix.

Footnote references to Descartes' works are given as follows: Short title, chapter or major section (Roman numeral), subsection, if any (Arabic numeral), source (usually AT), volume number (Roman numeral), and page number (Arabic numeral).

In addition to the members of my guidance committee, the following persons have made suggestions or criticisms of portions of the thesis: Willis Doney, Joseph Hanna, Gerald Massey, Phyllis Morris, George Nakhnikian, and Julius Weinberg.

I want to acknowledge with thanks the computer time and programs made available by the MSU Computer Laboratory, the Computer Institute for Social Science Research, and the Learning Systems Institute, and the help of Beverly Louisell, John Hafterson, and Mary Rafter, for preparation of a number of indexes to the Discourse and the Meditations, and to my notes on the other writings. Thanks to Cherry Cushing for typing the final draft.

And my special thanks to Dr. Charles Wrigley, Director of the Computer Institute for Social Science

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Research, without whose encouragement and support this work might not even have begun.

The thesis was completed with support from the Hinman Graduate Fellowship and Graduate Office Scholarship.

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CHAPTER I

THE CARTESIAN ORDER

Sceptics of Descartes' time used an argument which says that there can be no such thing as rational certainty. In order to be certain, the rational person must have a criterion of certainty. But this criterion, as the Pyrrhonist sceptics pointed out, can itself be challenged:

. . . in order to decide the dispute which has arisen about the criterion we must possess an accepted criterion by which we shall be able to judge the dispute; and in order to possess an accepted criterion, the dispute about the criterion must first be decided. And when the argument thus reduces itself to the form of circular reasoning the discovery of the criterion becomes impracticable, since we do not allow them [the dogmatic philosophers] to adopt a criterion by assumption, while if they offer to judge the criterion by a criterion we force them to a regress ad infinitum.¹

Michel de Montaigne, writing about 1580, just before Descartes' birth in 1596, applied a similar argument to sense perceptions:

In order to judge the appearance which we receive from the subjects, we would have to have a judicatory instrument; in order to verify that instrument, we

¹Sextus Empiricus, Outlines of Pyrrhonism, R. G. Bury, trans. (Cambridge, Mass.: Loeb Classical Library, 1939), Book II, Chap. iv., sec. 20, pp. 163-65. Quoted by Richard H. Popkin, The History of scepticism from Erasmus to Descartes (Assen: van Gorkum-Prakke & Prakke, 1960), p. 52. (Hereinafter referred to as Scepticism.)

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The sceptical position appears to be very strong, if we are willing to accept its analysis of the process of rational justification. It says that, whenever anyone claims to be certain of something, then there must be some criterion, rule, procedure or method by which his certainty is to be justified. If there is no such criterion, then we may say that he is simply a dogmatist, who has no rational basis for his certainty. On the other hand, if he does offer a criterion, then we may ask how his certainty about, or reliance upon, the criterion is to be justified. Again, if he offers no criterion, he is simply a dogmatist, and if he does offer a criterion, it may be called into question. This process may be continued indefinitely. If he refuses to play the game, then he is a dogmatist. If he continues to produce new criteria, then he is caught in an endless regress. If he uses some earlier criterion to justify a later criterion, then he is arguing in a circle. Neither a regress nor a circle can be said to provide a rational basis for belief, and a dogmatist is nonrational by definition. At no point, then, can a person give a complete rational justification of his certainty.

²Michel de Montaigne, Apologie de Raimond Sebond, in Les Essais de Michel de Montaigne, Pierre Villey, ed. (Paris, 1922), II, 366. My translation. Quoted by Popkin, Scepticism, p. 52.

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In the Meditations, Descartes develops a position which contrasts with that of the sceptics. He attempts to show that we can attain to a rational certainty of some things. We can show, he claims, that the human mind or soul exists, that God exists, and that there are secure foundations for the sciences. We can show this without falling into a circular argument or infinite regress, and without an appeal to dogmatism, or what Descartes calls "prejudice" and "precipitation."³

If our criterion or "judicatory instrument" is such that cannot be doubted, then it would make no sense for the sceptic to require our justification for it, and it might serve as the basis for a rational certainty. For example, if there is some set of propositions, C, such that the sentence "I doubt that X" is strictly nonsense, for all X's which belong to C, then it will be impossible for the sceptic to call members of this set into question. For whenever he says the words "I doubt that X," he is asserting nothing at all. Membership in C would then serve as a criterion of certainty.

Descartes believes that he has found such an X in the affirmation of his own present existence. "I am," "I exist," is true, every time I utter it or think about it.

³Discourse, II, AT, VI, 15.

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When I doubt, this doubt requires my own existence. Thus it makes no sense for me to say, "I doubt that I exist." No sceptic could sincerely assert such a sentence.⁴

If we are to grant that Descartes, through some such argument as this, can undermine the most extreme claim of the sceptic, is there anything else that we can know with certainty? I want to attempt to trace Descartes' answer to this question in the order that Descartes calls the "order of knowing":

One of the essential precepts of the Cartesian logic is to "conduct" his thoughts "by order." And everyone knows the Cartesian order, which is found in similar forms in the Discourse, in the Meditations, in the Principles: I doubt, I know that I doubt and, as a consequence, that I think and am, I know that God is, and that he cannot be a deceiver, I can therefore found a science of the world upon clear ideas, and finally derive from that science the technical applications which will make me master of Nature.⁵

Following the Cartesian order, we will begin with doubt and personal existence, the proofs of God, and of God's non-deceptive character, and the type of certainty

⁴Cf. Meditations, II, AT, IX, 21. This is not to say that no sceptics have ever succeeded in raising doubts about the soundness of the cogito. Popkin's Scepticism, p. 204, tells about some. See also A. J. Ayer, "I think, therefore I am," The Problem of Knowledge (New York: St. Martin's Press, 1956), pp. 45-54; Bernard Williams, "The Certainty of the cogito," Cahiers de Royaumont, Philosophie, No. IV: La philosophie analytique (Paris: Les Editions de Minuit, 1962), pp. 40-57, translated in Willis Doney, Descartes (Garden City: Anchor Books, 1967), pp. 88-107.

⁵Ferdinand Alquié, Descartes (Paris: Hatier-Boivin, 1956), p. 5. Cf. to Mersenne, Dec. 24, 1640, AT, III, p. 266.

upon which these proofs are based. We will then turn to the certainty of the physical sciences and the "eternal truths," in the peculiar sense in which Descartes uses this term. Finally, we will briefly discuss the "moral certainty" of the empirical knowledge that we cannot gain without the help of the senses. My aim is to find the sort of things that will count as knowledge at each of these stages, and the sort of faculties, powers, or dispositions that are required by the human being who can know these things.

Knowledge, for Descartes, is an organic unity. In his earliest speculations about the dreams that he had on the night of November 10, 1619, he believes that they show that all the sciences can be brought together. At the other end of his career, in the Principles, he says:

All philosophy is like a tree, whose roots are metaphysics, whose trunk is physics, and whose branches which come from this trunk are all the other sciences, which can be reduced to three principal ones, medicine, mechanics, and morals.⁶

⁶Principles, Preface, AT, AT, IX2, 14. For Descartes' dream, see Olympica, AT, X, pp. 179-88. Cf. to Mersenne, Mar., 1636, AT, I, p. 339; Discourse, V, AT, VI, p. 57. For the historical sources of the tree image and the ideal of the unity of the sciences, see Paolo Rossi, "Studi sul Lullismo e sull'arte della memoria nel Rinascimento. La memoria artificiale come sezione della logica: Ramo, Bacone, Cartesio," Rivista critica di storia della filosofia, XV (1960), pp. 22-62, especially pp. 48-49. (Hereinafter referred to as "Memoria artificiale.") Cf. Rules, XIV, AT, X, pp. 450-51.

CHAPTER II

THE EVIL GENIUS

We begin, according to the Cartesian order, with doubt. For in overcoming the most powerful doubt we attain the firmest certainty, if certainty is to be attained.

The personification of the source of doubt is the evil genius of the Meditations. He appears near the end of the first Meditation, where he proceeds to employ all his industry in deceiving the author:

I will suppose, then, that there is, not a true God, who is the sovereign source of truth, but a certain evil genius, not less full of ruses and deceptions than powerful, who has employed all his industry in deceiving me. I will think that the sky, the air, the earth, colors, figures, sounds, and all the external things which we see, are only illusions and deceptions, which he uses fraudulently to obtain my belief. I consider myself as having no hands, no eyes, no flesh, no blood, as having no senses, but believing falsely that I have all these things.¹

¹ Meditations, I, AT, IX, pp. 17-18. This may be the only time in the history of philosophy when the evil genius appears in quite this form. He is, however, not quite without precedent. Popkin finds a similar genius in the writings of Montaigne, Scepticism, p. 182. I do find some connection between him and Protervus, the "insolent," who plays the role of devil's advocate in the writings of an Ockhamist philosopher, Pierre d'Ailly. I want to discuss d'Ailly's doctrines in an appendix.

Bouwsma compares the genius with the devil of the Genesis story. O. K. Bouwsma, "Descartes' evil genius," Philosophical Review, LVIII (1949), pp. 141-51. But

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Descartes' genius is different from the serpent of Eden: "This evil genius promised no good, promised no knowledge," in contrast with Eve's tempter.

I suppose that the genius could be identified with the devil. The Faust legend was immensely popular in Europe around 1600, with travelling puppet shows retelling the story in every town. Mephistopheles tempts Faust with visual images of potential sins, just as the genius tempts Descartes with images of a non-existent external world. But Descartes' genius tempts men to believe in false ideas, rather than to engage in other sins.

Plato's puppet-maker furnishes a better model. He appears in the Republic (myth of the cave, 514), the Laws (as the crudest of the artist-imitators, 803), and in the Sophist (as the θαυμασιώσιμος, 235B). The concluding definition of the sophist, who engages in "the art of contradiction-making, descended from an insincere kind of conceited mimicry . . . that presents a shadow-play of words . . ." (268CD, Cornford tr.) seems to apply to the genius. Θαύματα could be either wonders or puppets. Aristotle exploits this ambiguity in the Metaphysics, where he says that philosophy begins in wonder and ends in understanding. In the same way, he says we wonder at puppets (Θαύματα ταυτώματα) but end by understanding their mechanism.

As for Descartes: One of his early manuscripts was titled "Thaumantis Regia," or "wonders of the king," in which he speculated (according to Millet) "about ways of producing unusual effects by the resources of optics and mechanics." His initial deception by the automated Neptune in one of the grottoes that were extremely popular in France during the late Sixteenth Century, and his many fascinated descriptions of such automata, from those in Le monde down to the uncompleted plan for the Search after truth (AT, X, p. 505) testify to this interest.

In the Latin version of the Meditations (AT, VII, p. 325), he sees hats and coats but wonders whether they might not be automata. The answer is not given by the testimony of the senses but comes through the understanding. Here, as in the other instances, to be deceived means to be presented with images or ideas which lead to an incorrect judgment.

Descartes may have referred to an "evil genius" in his account of his dream of November 10, 1619. He may, however, only have written of an "evil spirit." AT, X, pp. 185-86. Except for this possible reference, Descartes never speaks of an evil genius except in the first and second Meditations, and in his discussions of these passages.

The supposition of an evil genius comes at a crucial point in the Meditations, because it is in overcoming the doubt that this supposition raises that Descartes finds the beginning of a solution to the problem of establishing "something firm and constant in the sciences."²

In his encounter with the genius, Descartes finds that there is one thing that he can know to be true:

. . . I persuaded myself that there was nothing at all in the world, that there was no sky, no earth, no minds, nor any bodies; was I not also persuaded that I was not? Not at all. I was, there was no doubt of that, if I was persuaded, or if I only thought something. But there is a deceiver, I don't know who, who is very powerful and full of ruses, who uses all his industry to deceive me continually. There is therefore no doubt that I am, if he deceives me; and let him deceive me as much as he wants to, he will never be able to make it so that I am nothing, as long as I think that I am something. So that, after having thought well about it, and having carefully examined all things, I must at last conclude, and take as constant the fact that that proposition: I am, I exist, is necessarily true, every time that I pronounce it, or that I conceive it in my mind.³

This proposition (as Descartes says in a corresponding passage of the Discourse, concerning the cogito) "was so firm and so assured, that all the most extravagant suppositions of the sceptics were not capable of shaking it."⁴

²Meditations, I, AT, IX, p. 13. Sciences or scientiae are any fields of assured knowledge.

³Meditations, II, AT, IX, p. 19.

⁴Discourse, IV, AT, VI, p. 32.

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Since the supposition of an evil genius is probably the most powerful of those extravagant suppositions, it deserves to be taken seriously. At the same time, the character of the genius is problematic. He is evil, because he tempts men to adopt false beliefs. But if he is very powerful, as Descartes assures us that he is, then his deception may be completely successful. And if it is completely successful, to the extent that there is no criterion by which anyone can tell that it is a deception, then we may wonder whether to call it a "deception" at all.⁵

A deceptive god (who is, we may assume, infinitely more powerful than the evil genius) could undermine all knowledge:

. . . for a long time I have had a certain opinion in my mind, that there is a God who is capable of all things, and by whom I was created and produced just as I am. But who could have assured me that that God could not have made it such that there is no earth, no sky, no extended body, no figure, no size, no place, and that nevertheless I had the sensations of all these things, and that all of them seemed to me to exist exactly as I see them? Still more, just as I sometimes judge that other people are mistaken, even in the things that they know with the greatest certainty, it could happen that this god has wished me to deceive myself every time that I add two and three, or that I count the sides of a square, or that I judge something easier, if anything can be imagined which is easier than that.⁶

⁵This is the possibility that Bouwsma exploits. If there is no criterion by which we can ever determine whether any experience is deceptive or veridical, then we would seem to have deprived the word "deception" of all its meaning. At least this is what I take to be Bouwsma's view, in "Descartes' evil genius."

⁶Meditations, I, AT, IX, p. 16.

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Given sufficient power, an evil genius or a deceptive god could cause us to have sensations which do not differ in any detectable manner from the sensations which we have of the real world. And he might be able to do even more than this. The inference to "I am," "I exist," from my immediate knowledge of my thoughts is, in some sense, a logical inference. Can this logical connective be falsified by the genius? If I am capable of doubting that two and three are five, or that a square has four sides, can I not also doubt the logical connective between "I think" and "I am"? Perhaps it is just at this point that the most radical deception occurs, in the illusion that there is some ego, some substance, underlying the collection of thoughts that I call mine.⁷

⁷In a well-known article, Jaakko Hintikka argues that the cogito is not an inference so much as a performative utterance. Jaakko Hintikka, "Cogito, ergo sum: inference or performance?," Philosophical Review, LXXI (1962), pp. 3-32.

In speaking of it as an inference, I have in mind the following passages: ". . . I noticed that, while I thus wished to think that everything was false, it was necessarily true that I, who thought it, was something." Discourse, IV, AT, VI, p. 33. "No, certainly, doubtless I was, if I was persuaded, or only if I thought something." Meditations, II, AT, IX, p. 19. "And when I stated that this proposition, I think, therefore I am, is the first and most certain which presents itself to those who philosophize in orderly fashion, I did not for all that deny that we must first of all know what is knowledge, what is existence, and what is certainty, and that in order to think we must be, and such like" Principles, I, 10, AT, IX2, p. 29.

In each of these passages, Descartes seems to wish to presuppose a logical principle of the general form given in the passage from the Principles.

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Descartes must stop somewhere short of this total scepticism, which would be a nihilism from which no one could return. He nevertheless often gives the impression of being ready and able to doubt everything: ". . . I will apply myself seriously and freely to the general destruction of all my former opinions." ". . . I proposed as false all that I previously held to be very true, for the sole reason that I noticed that one could doubt it in some way." "I doubt all things and am certain of nothing."⁸

While these passages may give the impression that Descartes is willing to doubt everything, he finds that he is not able to do so. Consider the last passage. It

But the correct analysis of the cogito is not a simple matter, and I do not believe that Descartes was consistent in his characterization of it. In particular, in contrast with the analysis given in the Principles, he maintains that the cogito is not a syllogistic inference, and perhaps not an inference at all, but an immediate intuition. Cf. Replies, II, AT, IX, p. 110.

Descartes later attempts to reconcile these positions: "Before that conclusion: 'I think, therefore I am,' one may have recognized the major: 'Everything that thinks, is,' because in reality it is prior to my conclusion and because my conclusion is based upon it. And it is thus that in the Principles the author says that it precedes it, because implicitly it is always supposed and prior. But I do not always have an express and explicit recognition of that priority, and I nevertheless recognize my conclusion, because I pay attention only to what I experience in myself, knowing: 'I think, therefore I am,' while I do not pay as much attention to that general notion: 'Everything that thinks, is'; actually, as I have warned, we do not separate these propositions from singular things, but we consider them in the things; it is in this sense that the words cited here ought to be comprehended." Burman, AT, V, p. 147.

⁸Meditations, I, AT, IX, p. 13; Meditations, IV, AT, IX, p. 47; Search, AT, X, pp. 514-15.

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is placed in the mouth of Polyander, a bright but uneducated character in the dialogue, The Search after Truth, who is about to be shown that he cannot doubt his own existence. He cannot really "doubt all things." Similarly, the first passage, at the beginning of the Meditations, represents an intention, which does not really succeed in destroying all former opinions.⁹ Only the second passage seems to say that all former opinions were rejected, and here the phrasing is ambiguous. Probably only those opinions which could be doubted were rejected.¹⁰

Whatever Descartes' intent in these and similar passages, it has been clear to many commentators that the evil genius left a large area of belief or opinion untouched by his deceptions.

According to one of the most respected of these commentators, Octave Hamelin, "The evil genius is nothing other than a personification of the violence with which the nature of the universe, which is perhaps irrational, is perhaps forced to submit to the mind." He later

⁹Cf. Meditations, II, AT, IX, p. 19.

¹⁰Descartes repeatedly maintains that he did not reject all objects of belief. Cf. to Gibieuf, Jan. 19, 1642, AT, III, pp. 472-73; Replies, VII, AT, IX, pp. 959, 979, 970, 1060, et passim.; Meditations, II, AT, IX, pp. 18-19; ". . . I reject, as absolutely false, all that in which I could imagine the least doubt." Discourse, IV, AT, VI, p. 31; but he does not reject what he cannot doubt.

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simplifies this somewhat obscure characterization: "The evil genius . . . is the personification of the irrational influences which are able to penetrate into thought."¹¹ Jean Wahl further simplifies Hamelin: "The evil genius was the symbol of irrationality."¹² Similarly, Francois Misrachi paraphrases Hamelin: "The 'evil genius' thus signifies the possible irrationality (at this point of the Meditations) of everything."¹³

Hamelin calls attention to the fact that neither the genius nor the deceptive god can undermine the rationality of human thought itself. In particular, Hamelin's rejection of the notion that the evil genius represents "an essential falsity of intelligence" will provide the beginning of an answer to our initial questions. At the same time, I think that we will find that it is less than helpful to use the terms "rational" and "irrational," which never appear in the Meditations, unless we have a clear understanding of the way in which we are to translate these

¹¹Octave Hamelin, Le système de Descartes (Paris: Alcan, 1911), pp. 118, 143. The first passage is: "Le malin génie n'est autre chose qu'une personnification de la violence que fait peut-être subir à l'esprit la nature peut-être irrationnelle de l'univers." Although this is perhaps the best-known French characterization of the genius, I am not at all sure that I have rendered it either comprehensibly or correctly in English. The additional quotations are to be taken as explications of it.

¹²Jean Wahl, Tableau de la philosophie française (Paris: Gallimard, 1962), p. 16.

¹³René Descartes, Discours de la méthode, François Misrachi, ed. (Paris: Union Générale d'Editions, 1963), p. 219.

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terms into a Cartesian vocabulary. Hamelin certainly attempts to give such a translation, but it is not clear that this carries over into Wahl's and Misrachi's popularizations.

Henri Gouhier believes that Hamelin's view is not based upon Descartes: "What is annoying in that profound interpretation, is that Descartes never thought of it." Emphasizing the voluntarism of Descartes' theology, Gouhier finds that the charge of deception, directed against the deceptive god, is one that accuses him of a faulty will. The hypothesis of a deceptive god, he finds, "is born out of a scruple of the intelligence; it is by nature metaphysical" and thus must be sharply distinguished from the hypothesis of the evil genius, who is no more than an artifice, used once in an experiment and then discarded.¹⁴

I think that the only American author who has written at any length about the genius is O. K. Bouwsma, who finds him not only artificial, but also off on the wrong track. Bouwsma tells the following story: Planning to deceive a young man named Tom concerning the existence of the external world, the genius first turns everything, including Tom's own body, to paper. Tom readily detects the deception. Next, the genius falsifies the entire external world in such a way that Tom cannot tell the

¹⁴Henri Gouhier, Essais sur Descartes (Paris: Vrin, 1949), pp. 171, 162-63. I want to return later to the question of voluntarism.

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difference. This time, the genius is enraged to find that Tom doesn't really believe that he is being deceived, because he can not tell the difference.¹⁵

When Tom finds that he cannot perceive any difference between the genius' pseudo-world and the real world, the genius is forced, in the end, to maintain that he can tell because he has an additional kind of sensation, "cerpicio," through which he knows the difference between the false and the real. This is the only way in which anyone can tell the difference.

But this is not the way in which real illusionists know. If we were to ask a ventriloquist how he knows that the dummy is not really talking, he might reply (if he were addicted to rather an old-fashioned philosophical terminology) in terms of his immediate intuition of his own volitions. He knows because he wills the dummy to talk. He knows this even if his pretense is so perfect that no one else can tell the difference. Suppose that two skilled ventriloquists, Smith and Jones, have a dummy seated between them. At a signal, the dummy says, "Hello!" We ask Smith and Jones, "Which of you said that?" When Jones answers, it may very possibly be true that there is no way whatever of finding out whether he is telling the truth or attempting to deceive us. We would have to take his answer on faith, if we took it at all. That is, we

¹⁵⁰. K. Bouwsma, "Descartes' evil genius."

would have to trust in whatever evidence we have that he is not a deceiver. This seems to me to be the sort of thing that Descartes was saying about God.

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CHAPTER III

REASON, RECOGNITION AND CONCEPTION

A few recent writers have attempted to show that Descartes believed that human reason could not be completely discredited by the machinations of the evil genius.¹

Like the references to "irrationalism" in the French writers, the references to "reason" in the English-speaking authors raise a problem of interpretation when we discuss Descartes' Meditations. Let me phrase the question in rather an over-simple form, in order to illustrate this problem. Let me ask: Does Descartes, in the Meditations, regard the human faculty which he calls "reason" to be infallible, or can the sceptic cast doubt upon it?

To answer the question in this form, we note that there are, in fact, only five references to "reason" as a faculty of the human mind, in the French Meditations.²

¹Norman Kemp Smith, New studies in the philosophy of Descartes (New York: Russell & Russell, 1966), p. 62. Harry G. Frankfurt, "Descartes' Validation of Reason," American Philosophical Quarterly, II (1965), pp. 149-56. John O. Nelson, "In defence of Descartes: Squaring a reputed circle," Dialogue, III (1964), pp. 262-72.

²There are actually 59 uses of the term raison and its cognates. Most of these, however, do not refer to a

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They are as follows:

(1) "But, inasmuch as reason persuades me already that I ought not to prevent myself less carefully from giving credence to things which are not entirely certain and indubitable" ³

(2) "I am, precisely speaking, only a thing which thinks, that is, a mind, an understanding, or a reason, which are terms of which the signification was previously unknown to me." ⁴

(3) "To be sure, these two ideas of the sun, which I conceive, cannot both be similar to the same sun; and reason makes me believe that that which comes immediately from its appearance is that which is the most dissimilar to it." ⁵

(4) "And because I remember also that I more often made use of sense than of reason" ⁶

(5) "For since nature seems to carry me to many things from which reason turns me away, I did not believe

specific faculty of the mind at all. For example, "I cannot comprehend God's reason for doing this." AT, IX, p. 44. "And as for those reasons for doubting" AT, IX, p. 61. And so on. None of the uses of the term would tend to contradict the indicated conclusions.

³AT, IX, p. 14.

⁴AT, IX, p. 21.

⁵AT, IX, p. 31.

⁶AT, IX, p. 60.

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Although each of these passages may raise interesting problems of interpretation, it is perfectly clear that in none of them does Descartes seem to be attempting to justify reason, to be doubting it, or in any way to be discussing its reliability. In the second passage, "reason" seems to be taken as an alternative term for "mind" and "understanding." In the other four passages, "reason" is the name of a faculty which certainly appears reliable--more reliable than sense (in (3) and (4)) and more reliable than natural inclination (in (5)).⁸

But this is scarcely the beginning of an answer. Although reason may never be doubted, explicitly, in the Meditations, we are not at all justified in supposing that Descartes believes it to be infallible. For, if "reason" is indeed to be taken as the equivalent of "mind" or "understanding," Descartes would then be committed to the incredible view that men's minds are infallible. And if "reason" is not equivalent to "mind," we are not told how it is different from it.

But we may be able to get some help from Descartes' early unfinished Rules for the direction of the mind. In referring our questions to the Rules, however, we have to

⁷AT, IX, p. 61.

⁸Cf. Replies, III, AT, IX, p. 135.

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remember that the manuscript of the Rules was never completed, and that it was not published during Descartes' lifetime. I do not believe that Descartes makes any reference to the work in his correspondence, which, in contrast, contains repeated reference to another unpublished work of about the same period, Le monde. Thus we can scarcely say that Descartes was committed to any of the doctrines outlined in the Rules, since he may have abandoned work on the Rules precisely because he found some of its doctrines untenable.

However, as L. J. Beck has shown in detail, the method proposed in the Rules does seem to underlie much of his later work. If this is so, then it may be that the analysis of the mind in the Rules may help us to understand some of the terms employed in the Meditations.⁹

In the Rules we find that the faculty of intuition, the "power of knowing," or what I will call the "power of recognizing," serves as a source of undoubted knowledge. As Beck describes it,

The power of knowing, the vis cognoscens, is absolutely distinct from, and in no way directly dependent upon, the body or anything bodily: it is a spiritual power and it retains its spiritual character, its self-identity in whatever field it is applied or whatever the knowledge in which it finally issues. . . . It is to be regarded as a "natural light," an "intellectual vision," a natural power

⁹Leslie J. Beck, The method of Descartes (Oxford: Clarendon Press, 1952).

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of discerning or discriminating the true from the false, and is variously described by Descartes as "human wisdom," "good sense," or the "natural light of reason."¹⁰

We will also want to refer to the following passages in the twelfth Rule:

First and last, it must be conceived that that force by which we know a thing [*vis cognoscens*], in the true sense of the word "know" [*cognoscere*], is purely spiritual, and that it is no less distinct from everything corporeal than blood is from bone, or the hand from the eye. It is of a simple nature, which either receives shapes from the senses in common as does the imagination, or applies itself to those which are preserved in the memory, or forms new ones by which the imagination is so occupied that it is often unable, at the same time, to receive ideas from the senses in common, or passes them on to the motive force almost in the same way as by the control of the body alone. In all these cases this cognitive faculty is sometimes passive, sometimes active; sometimes acting like the seal, sometimes like the wax. But the last must be understood only as an analogy, for in corporeal matters nothing is every found exactly like this. And it is one and the same force which, when it applies itself with imagination to the senses in common, is said "to see, to feel," and so forth; when it applies itself to the imagination alone as it contains various shapes, is said "to recollect"; when it applies itself to the imagination in order to create new ideas, is said "to imagine" or "conceive"; and finally when it acts alone, is said "to understand." I will explain later, in its proper place, how this last is accomplished. For this reason this force is called, according to its various functions, either "pure intellect" or "imagination" or "memory" or "sensation"; but it is properly called "mind," whether it is forming new ideas in the imagination or is considering ideas already produced.¹¹

¹⁰Beck, The method of Descartes, p. 15. Beck's reference here is Rules, I, AT, X, pp. 360-61, where the terms in question are humana sapientia, bona mens, lumen rationis naturale.

¹¹Rules, XII, AT, X, pp. 415-16. Translated by Laurence J. Lafleur. In René Descartes, Rules for the direction of the mind (Indianapolis: Bobbs-Merrill, 1961).

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This passage is of fundamental importance in understanding the theory of the mind that Descartes advances in the Meditations. The vis cognoscens is said to have two functions. It is "sometimes like the seal, sometimes the wax," sometimes active, sometimes passive. In the last sentence, these two functions are characterized as (1) "forming new ideas," the active function, and (2) "considering ideas already produced," the passive function.¹² There is only one mind, but there are two functions of this mind.

According to Beck,

The "power of knowing" does not strictly include all forms of what are generally considered to be cognitive activities of the soul. In so far as it is purely "spiritual," it excludes sensating, imagining and remembering; in so far as it "knows" or "understands," it is said to act alone. The corporeal motions involved in sense-perception, imagining, and remembering can only be said to be cognitive in so far as they are accompanied, or completed, by an act of intellectual apprehension.¹³

The analysis of the mind in the Rules, then, is one in which the power of knowing, or "power of recognizing," plays a central role, in which its characteristic function is "intuition," using the "natural light."

¹²Notice that "forming new ideas" seems to include sensing, recollecting, imagining, and understanding. In any case, I take the "active" function to mean all acts by which an idea is brought before the mind.

¹³Beck, The method of Descartes, p. 32. The "act of intellectual apprehension" is what I think Descartes calls "conceiving."

The meaning of "active" and "passive" here is purely analogical, and was, in fact, dropped in the Meditations. There, the will is said to be active, while the understanding, taken as a whole, is said to be passive, but neither of these terms plays an important role in the Meditations.

A letter to Regius in 1641 suggests the difficulty that Descartes finds in applying terms like "active" and "passive" to the mind:

I received your theses, and I send you my thanks for them: I didn't find anything in them which did not please me. What you say there about action and about passion does not seem to me to cause any difficulty, providing that you comprehend correctly what those words signify: that is, that in corporeal things every action and passion consists only in local movement, and it is called action when that movement is considered in the mover, and passion when it is considered in the thing which is moved; from which it follows, then, that when these words are applied to immaterial things, something analogous to movement has to be considered in them, and it is necessary to call "action" that which is the role of the mover, such as is the will in the soul, and "passion" that which is the role of the thing which is moved, such as intellect and vision in the same soul. As for those who believe that the name "action" has to be given to conception [percipio], they seem to take the word "action" for every real power, and that of passion only for the negation of power; for, as they believe that conception is an action, they do not have any difficulty with saying that the reception of movement in hard bodies, or the force by which they receive movement from other bodies, is an action, which cannot be said, because the passion which is correlative to that action would be in the mover, and the action in the thing which is moved. As for those who say that every action can be removed from the agent, they are not deceived, if by "action" they understand only the movement, without wishing to comprehend under the name "action" every force such as length, largeness, weight, and the force for receiving all kinds of

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I think that this letter to Regius shows that Descartes has here rejected the use of the terms "action" and "passion" as he used them in the Rules, to apply to the power to bring ideas before the mind, and the power to consider ideas. Nevertheless, it seems to me that he has retained an analysis of the understanding in which these two powers represent its two fundamental activities. To show this, we will have to look rather carefully at the Meditations. I want to trace Descartes' rather special use of the terms "power of recognizing" (or "power of knowing") and "natural light."

The Latin cognitio and the French connaissance, which I will translate as "recognition," do not have a precise equivalent in English. In both modern and classic French, connaître, to know by acquaintance, to recognize, is distinguished from savoir, to know by understanding. The corresponding noun, connaissance, may be translated either as "recognition" or as "knowledge." (The noun corresponding to savoir is properly sapience, but this is rare, and Descartes never uses it. Science, I think, serves this purpose, and Descartes uses this term regularly to designate a body of knowledge.) The distinctive use

¹⁴To Regius, Dec., 1641, AT, III, pp. 454-55.

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that Descartes makes of the term connaître is often lost in English translations.¹⁵

I will use the work "recognize" to translate connaître (Latin cognoscere) and "recognition" to translate connaissance (Latin cognitio). The effect is inclined to be somewhat stilted, and the reader may prefer to use "know" and "knowledge" where I have used these words.

We encounter somewhat similar problems with another term. The French versions of Descartes' works generally use the term concevoir where the Latin versions use either of two words, percipere and intellegere. Many English versions seem to follow the Latin forms, using such terms as "perceive" and "intellect." To do so, I think, misses Descartes' meaning.¹⁶

¹⁵For example, on two consecutive pages of the standard Haldane and Ross translation of the Discourse, II (HR, I, pp. 92-93, AT, VI, pp. 18-19), at the statement of the four precepts of the method, connaître and connaissance are rendered, in succession, "recognize," "knowledge," "cognizance," "apprehend," and "comprehend." While this variety of translations may be justified by the varying uses to which the term is put, they conceal from the English-speaking reader Descartes' characteristic use of the term.

Equally impressive is the way in which a single term in English may represent a variety of terms in French and Latin. One particular horror is the English word "perceive," which HR uses to render percevoir, concevoir, apercevoir, and sentir.

¹⁶Later, Descartes will attempt to distinguish among intellection, conception, and imagination. It is not clear, however, that there is any such distinction between intellection and conception in the Meditations. The later distinction is this: "It is necessary here to distinguish with care among intellection, conception, and imagination: a distinction which is very useful; take,

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In both French and English, there is a very considerable difference in meaning between "perception" and "conception." For one thing, in English, to "perceive" usually suggests a sense-perception, but to "conceive" never does. For another thing, to "perceive" means to perceive truly, but to "conceive" that something is the case does not mean that it is true.¹⁷ It would make sense to say, "I conceived that the hat was on the bear, but it was not." But it would not make sense to say, "I perceived that the hat was on the bear, but it was not." There is no doubt that "perceive" has acquired a good deal of its modern meaning after the time of Descartes, but it seems needlessly confusing to modern readers to continue to use "perceive" when, as we will see, "conceive" comes much closer to his meaning, and he himself usually chooses the French cognate of it when he is writing in French.

Descartes uses these two terms, "conceive" (concevoir) and "recognize" (connaître) to refer to functions of the understanding. I want to propose as a hypothesis that, in the Meditations, they refer to what he

for example, the perfections of God: we do not imagine them, nor do we conceive them, but we have the intelligence of them: as for the manner in which God, in a unique act, has the intelligence of everything, the manner in which his decrees are one with him, we do not conceive these things, but we have intelligence of them, because we cannot, so to speak, represent them to ourselves. . . ." Burman, AT, V, p. 154.

¹⁷In the chapter on "Eternal Truths," I want to try to characterize Descartes' use of the term "true."

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has called, in the Rules, the "active" and the "passive" functions of the mind. To "conceive," then, is to bring an idea or concept before the mind, and to "recognize" is to identify ideas, most importantly to identify them as true or false.

First, we have to show that conceiving and recognizing are functions of the understanding. In the fourth Meditation, Descartes explicitly identifies them in this way: ". . . the power of recognizing which is in me . . . that is, my understanding . . ." ¹⁸ ". . . the power of understanding or of conceiving: for I do not conceive anything except by means of that power which God gave me for conceiving . . ." ¹⁹ ". . . recognizing by the understanding always ought to precede the determination of the will." ²⁰ ". . . by the understanding alone . . . I conceive the ideas of things . . ." ²¹

These passages (and many others) make it clear that Descartes uses the terms "conceive" and "recognize" to refer to functions of the understanding.

We next have to show that it is the function called "conceiving" which is active. The last passage above shows this clearly. Throughout the Meditations, the process of

¹⁸Meditations, IV, AT, IX, p. 45.

¹⁹Meditations, IV, AT, IX, p. 46.

²⁰Meditations, IV, AT, IX, p. 47.

²¹Meditations, IV, AT, IX, p. 45.

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bringing ideas before the mind is called "conception" (Latin percipio, French usually conception, rarely perception.) Thus, when Descartes considers the wax, he says, ". . . its conception, or rather the action by which it is perceived (aperçoit), is not a vision, nor a touch, nor an imagination, and never has been, however it seemed to be before, but only an inspection of the mind (mentis inspectio), which can be imperfect and confused, as it was before, or clear and distinct, as it is at present, according to whether my attention is attracted more or less to the things which are in it, and of which it is composed."²² In this passage, "conception" is identified as an "action," which can be either confused, or clear and distinct. Obviously, the idea which is conceived need not be true. We are capable of conceiving a chimera, for example, although perhaps not clearly and distinctly.²³

²²Meditations, II, AT, IX, pp. 24-25.

²³A study of all of the 138 uses of connaître and its cognates, and of the 103 uses of concevoir (or percevoir) and its cognates, in the Meditations, further reinforces the hypothesis that these two terms serve to designate the passive and active functions of the mind as these were described in the Rules. Descartes obviously relies very heavily upon these two terms. A few further examples may help to clarify their meaning: ". . . I should not imagine that I fail to conceive the infinite by a true idea . . . I somehow have the notion of the infinite in me first . . ." Meditations, III, AT, IX, p. 36. "If I want to think of a chiliogon, I conceive well and truly that it is a figure composed of a thousand sides, as easily as I conceive that a triangle is a figure composed of three sides only . . ." Meditations, VI, AT, IX, p. 57. "For by the understanding alone I neither affirm nor deny anything, but I only conceive the ideas of things,

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When the understanding functions as the wax, it is passive, and is said to "recognize" its objects. When it functions as the seal, it is active, and is said to "conceive." Further, we will find that the ability to recognize the truth, the passive function of the mind, when it is freed from all bodily functions, like sensation, imagination, and memory, is called "intuition," and is recognition by the "natural light." The faculty of the understanding thus consists of two powers or faculties, the vis cognoscens, or power of recognizing, and the vis intelligendi, or power of conceiving.²⁴

which I can affirm or deny." Meditations, IV, AT, IX, p. 45. ". . . I do not know . . . if the ideas that I conceive of these qualities are actually ideas of some real things, or if they only represent chimeric beings to me, which cannot exist." Meditations, III, AT, IX, p. 34. On the other hand, to "recognize" does not mean to form an idea but to identify it, primarily to identify it as true or false. It is a "success" term; we do not recognize falsely. For example: "Thus I recognize that error, as such, is not something real . . ." Meditations, IV, AT, IX, p. 43. ". . . there are very few things that are recognized with certitude touching corporeal things, . . . there are many more things which are recognized by us touching the human mind, and many more still touching God . . ." Meditations, IV, AT, IX, p. 42.

²⁴For "puissance de connaître," see Meditations, IV, AT, IX, p. 45. Cf. "faculté de connaître," Meditations, IV, AT, IX, p. 45; Meditations, VI, AT, IX, p. 63; "faculté qui connaît," Meditations, VI, AT, IX, p. 57. For "puissance de concevoir," see Meditations, VI, AT, IX, p. 58. Cf. "puissance d'entendre ou de concevoir," Meditations, IV, AT, IX, p. 46; "facultés de vouloir, de sentir, de concevoir, etc.," Meditations, VI, AT, IX, p. 68; "faculté de concevoir," Meditations, III, AT, IX, p. 29; Meditations, IV, AT, IX, p. 45.

The distinction between the vis intelligendi and the vis cognoscens seems closely related to a comparable distinction in Aristotle. Laporte discusses the

Aristotelian analysis, but does not make this particular application of it to Descartes: ". . . intelligible essences . . . are in the sensible world. But they are enveloped in it, like gold in its ore. And the vous poietikos draws them from it, by a mysterious operation of transformation, in order to imprint them in the vous pathetikos where they are perceived in a sort of intuition. Before the operation, the vous pathetikos contains them only in potentiality. . . ." Laporte, Rationalisme, p. x. This seems to be the analysis at Aristotle De anima 3.5. 430a10-25. Similarly, the figure of the seal and the wax appears in Aristotle De anima 2. 12. 424a16-424b20, but it serves a purpose which is quite different from that of Descartes.

In making the application to Descartes, we should notice that, for Descartes, ideas may be innate, in the sense that they are dispositional characteristics of the mind. When the mind contains, e.g., the innate idea of God, this does not mean that the mind is a container, and the idea of God is somehow present in it, like a marble in a box. In the Notes, Descartes states his position with great care: "For I never wrote or concluded that the mind required innate ideas which were in some sort different from its faculty of thinking; but when I observed the existence in me of certain thoughts which proceeded, not from extraneous objects nor from the determination of my will, but solely from the faculty of thinking which is within me, then, that I might distinguish the ideas or notions (which are the forms of these thoughts) from other thoughts adventitious or factitious, I termed the former 'innate.'" Notes, XII, AT, VIII2, pp. 357-58.

This active process, by which thoughts are said to "proceed" from external objects or from the understanding itself, is what I take conceiving to be. When we conceive, e.g., of God, we bring the innate idea from potentiality into actuality. In this sense, we may be said to "form" innate ideas, as well as factitious ideas.

The process which I am calling "conceiving" is that which the third Meditation characterizes as representing an idea to oneself: "Among my thoughts, some are like images of things, and it is to these alone that the name 'idea' properly belongs: as when I represent to myself a man, or a chimera, or the sky, or an angel, or God himself." Meditations, III, AT, IX, p. 29.

(I find, after stating that "conceiving" is "forming ideas," that the HR translation uses "formed" to translate finguntur in the third Meditation, in such a way as to suggest that only factitious ideas are "formed" by the mind. Meditations, III, AT, VII, p. 38; HR, I, p. 160. (There is no corresponding word in the French version, which speaks of hippogriffs and chimeras as "fictions and inventions of my mind.") When I speak of conceiving as

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the act of "forming ideas," I mean the process of which Descartes speaks in the paragraph from the third Meditation quoted above, and not the process that HR translates as "formed." In the Rules, the Latin is formare.)

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CHAPTER IV

THE NATURAL LIGHT

I want to discuss the function of the natural light in some detail, because it plays a peculiar and important role in the central arguments of the *Meditations*. Like the character of the evil genius, it appears quite suddenly in the *Meditations*. Although we may find the expression "natural light" in some of the earlier writings, it is not given any very crucial job to do until the third Meditation. There, however, the axioms in the proofs of the existence and veracity of God are said to be manifested to us by the natural light, and thus, somehow, to be beyond doubt. Since mathematics and physics depend upon the metaphysical proofs, our science could have no foundations without the axioms that the natural light reveals.

The important role of the natural light is suggested by the number of references to it in Descartes' writings. The Index Scolastico-Cartesien lists some sixty page references to it, which seems surprising for so unusual a term.¹

¹Etienne Gilson, Index Scolastico-Cartesien (New York: Burt Franklin, 1965; reprint of Paris, 1912).

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Certain passages from Aquinas illustrate the Scholastic use of the term "natural light":

One angel illumines another. To make this clear, we must observe that intellectual light [lumen naturale, natural light] is nothing else than a manifestation of truth, according to Ephesians V: 13: "All that is made manifest is light." Hence to illumine means nothing else than to communicate to others the manifestation of known truth.

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We have a more perfect knowledge of God by grace than by natural reason. Which is proved thus. The knowledge which we have by natural reason requires two things: images derived from the sensible things, and a natural intelligible light enabling us to abstract intelligible conceptions from these.²

Aquinas' use of the term "natural light," however, is not the only one that was available to Descartes. In an appendix, I attempt to show that Descartes shares a number of his views with the Ockhamist legal philosopher of the fourteenth century, Pierre d'Ailly. The views that they share are distinctive enough to suggest that Descartes was familiar with the work of d'Ailly, or of someone with very similar doctrines. D'Ailly's use of the term "natural light" is quite different from that of Aquinas. For d'Ailly, the natural light is not a source of natural reason. On the contrary, the natural light is contrasted with natural reason. The philosopher must keep them separate:

²St. Thomas Aquinas, Summa theologiae, I, q. CVI, 1; q. XII, 13. Anton C. Pegis, ed., Basic writings of Saint Thomas Aquinas (New York: Random House, 1945), vol. I, pp. 983, 110.

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. . . By "natural light," d'Ailly designates every form of recognition which is absolutely indubitable in itself and under every hypothesis. If the philosopher forgets this condition, if he affirms as evident "by the natural light" propositions which hold only under a certain hypothesis, he will find himself without reply when faced by the objections of Protervus [the devil's advocate]. But if he takes care to distinguish, in every circumstance, knowledge which is "without error" from knowledge which is "apparent," all his demonstrations will again find a positive value; not only those which are absolutely evident, but those also which are in the domain of natural reason alone, and which do not, as a consequence, have more than a relative evidence.³

As we will see, Descartes' use of the term is much closer to d'Ailly's than to that of Aquinas. For all three writers, however, the general characterization of it in the first passage, as a "manifestation of truth," would seem to apply.⁴

Descartes gives a clear statement of the meaning of the "natural light" in the Principles:

³M. Patronnier de Gandillac, "Usage et valeur des arguments probables chez Pierre d'Ailly," Archives d'histoire doctrinale et litteraire du Moyen Age, VIII (1933), p. 47, summarizing Pierre d'Ailly, Quaestiones Super I, II, III et IV Sententiarum (Lyon: Nicolaus Wolff, 1500), I, qu. 1, art 1, fol. 36F; I, qu. 3, art. 3, fol. 82a. Hereinafter referred to as Sent.

⁴Descartes' rejection of the natural light as that which enables us "to abstract intelligible conceptions" would clearly follow from his doctrine that intelligible conceptions are not abstracted from images of sensible things, but are innate. Cf. e.g. Rules, VI, AT, IX, pp. 383-84; to Mersenne, May 15, 1630, AT, I, pp. 145-46; Discourse, V, AT, VI, p. 41; Search, AT, X, p. 496.

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. . . the faculty of recognizing which God has given us, which we call natural light, never perceives [aperçoit] any object which is not true when it perceives it, that is, when it recognizes clearly and distinctly; because we would have to believe that God would be a deceiver if he had given it to us such that we took the false for the true when we use it well.⁵

At this point, Descartes seems to be equating the natural light to the power of recognizing (vis cognoscens) as a whole, rather than restricting it to the narrower role that it plays in the Meditations. If we give the natural light this broader scope, however, we find that Descartes is in rather serious trouble. If we combine this passage from the Principles with passages from the Meditations, and if we assume that the meaning of "natural light" remains constant, then Descartes is caught in a particularly vicious circle. In the Meditations, the natural light is the source of the principles of causality, upon which the proof of God's existence depends, and of the principle of God's veracity.⁶ In the Principles, Descartes regards it as possible that God could deceive us in our use of the natural light. If he can do so, then it

⁵Principles, I, 30, AT, IX2, p. 38.

⁶"Now, it is a thing which is manifest by the natural light, that there must be at least as much reality in the efficient and total cause as in its effect. . . . it is quite evident that he [God] cannot be a deceiver, since the natural light teaches us that deception necessarily depends upon some fault." Meditations, III, AT, IX, pp. 33, 41.

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is entirely possible that we are deceived when we apply the principle of causality to the idea of God in the Meditations.

The vicious circle, then, would go something like this. We know, with certainty, that God is not a deceiver, because we are taught this by the natural light. But we can know that the natural light is reliable only if we know that God is not a deceiver. This is precisely the form to which the sceptics attempted to reduce every rationalist argument. The criterion, the natural light, is valid only if another criterion, God's veracity, is proved. But God's veracity cannot be proved until we know that the natural light is valid. It does not seem to me that Descartes could have avoided this disastrous result, if we are permitted to combine the passage in the Principles with the argument in the Meditations.

Let us assume, however, that in the Meditations Descartes does not wish to say that the assertion of the natural light's reliability requires that we know, in advance, that God is not a deceiver. I think that we will find nothing in the Meditations which contradicts this assumption. Descartes would then agree with d'Ailly, that the natural light teaches us a principle which God cannot violate.⁷ For d'Ailly, this principle was simply the

⁷A more precise statement of Descartes' position is given in the discussion of the letters to Mesland and Elisabeth, in a later chapter.

principle of contradiction. But, as Descartes will later point out in The search after truth, the principle of contradiction is not enough to found a system upon.⁸

D'Ailly could construct nothing stronger than a proof that God probably exists. Descartes wants more than this, and he finds that he must assume some additional principles, if he is going to prove the existence of God and of the external world with certainty. These additional principles, or "axioms," are made manifest to us by the natural light.⁹

What is the natural light? Norman Kemp Smith's discussion of the faculties, as they are described in the Rules, gives one possible analysis. According to Kemp Smith, Descartes 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," marking off the main types of object upon which it can be directed. This, which is one of Descartes' most distinctive doctrines, is central in his teaching . . .

This equating of cognitive awareness with the natural light of reason, consistently held to by Descartes in all his writings, both early and late, was, it would seem, so unquestioned in his own personal thinking, that he was unduly neglectful of the need to enlighten his readers in regard to it.¹⁰

⁸Search, AT, X, p. 522.

⁹Replies, II (Proofs of the existence of God), AT, IX, pp. 127-29.

¹⁰Norman Kemp Smith, New studies in the philosophy of Descartes: Descartes as pioneer (New York: Russell & Russell, 1966, reprint of 1953 edition), pp. 73-74.

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I have already said that I do not believe that Descartes is really committed to the doctrines of the Rules, because he did not finish them and did not publish them or otherwise circulate them. What is more important, however, is that Kemp Smith's claim here is much too strong. "Understanding," "mind," and "reason" are probably alternative names for the same entity, but "natural light" does not seem to be equivalent to these. That is, it does not seem that the natural light is "equated to" reason, but only to one very specialized function of reason.

The correct analysis seems to be this. The soul has two major powers, active and passive. The active power is called "will." We will want to return to this term later. The passive power is the understanding or reason. Depending upon its object, it functions as sense, imagination, or memory. It may also have the understanding itself as its object. (We might call it the "pure understanding" when it is directed toward itself alone.) The understanding can itself be regarded in an active and a passive sense. Actively, it brings concepts or ideas into consciousness. It is then called the "power of conceiving." We can conceive nonexistent objects (such as a unicorn or a chimera), and we can conceive false propositions.¹¹ We can also form concepts or ideas of an

¹¹Descartes holds that ideas are materially false when they give occasion for error. Cold, for example, seems to us to be a real object or property, but it is

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extremely important sort, which are called "clear and distinct." These are, par excellence, the "eternal truths" of geometry and pure mathematics, certain of the laws of pure physics, and perhaps some other truisms. The last chapters of this thesis will be concerned with them. The understanding also functions in a passive sense. The ability to function in this way is called the "power of recognizing" (or "power of knowing"). We recognize a triangle or a square when we are reminded by a sketch of one. More importantly, we are able to recognize truth and falsehood. An important kind of knowledge can thus be obtained directly, simply by recognizing that certain things are true. For this last function, and this function exclusively, Descartes uses the term "natural light." The natural light is a faculty of the pure understanding which cannot be doubted.

Justification of this analysis will require detailed discussion of each of the terms involved, and will not be complete until the thesis itself is nearly finished. At the present moment, our specific concern is with what Descartes calls the "natural light."

I have characterized it as a passive function, specifically as a power of recognizing, rather than a power

merely the privation of a property. Descartes finds that Suárez also uses the term "materially" in this way. Replies, IV, AT, IX, p. 182. Cf. the later discussion of "eternal truths."

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of conceiving. It does not form ideas. Instead, it regularly appears in expressions like "I recognize by the natural light."¹² Thus, if the understanding is an active power of conceiving, and a passive power of recognizing, the natural light would appear to be connected with the passive power.

The natural light, is, moreover, the ability to recognize truth and falsehood. Descartes distinguishes this power from the "natural inclination to believe" as follows:

When I say that it seems that it is taught to me by nature, I understand by the word "nature" only a certain inclination which leads me to believe that thing, and not a natural light which makes me recognize that it is true. But these two things differ greatly between themselves; for I would not be able to cast doubt upon anything of what the natural light makes me see to be true [voir être vrai], as it has just made me see that, from the fact that I doubted, I was able to conclude that I was. And I do not have in me any other faculty, or power, for distinguishing the true from the false, which could teach me that what that light shows me to be true is not true, and which I could trust more than it.¹³

¹²In the Meditations, these phrases are: ". . . to recognize by the natural light . . ." AT, IX, p. 38; ". . . the natural light makes me recognize . . ." AT, IX, pp. 33, 35; ". . . I recognize by the natural light . . ." AT, IX, p. 65. Expressions like these do not appear in anything Descartes writes before the Meditations. I have not found any exceptions to this general rule in the later writings. Descartes never uses an expression like "I conceive by the natural light."

¹³Meditations, III, AT, IX, p. 30. Notice that the natural light is here represented almost as external, something that "makes me see," "shows me," and perhaps "teaches me." When he speaks in this way, Descartes makes it appear that the mind is passive and that the natural light is like some other force. But he is equally likely to say,

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The natural light, then, makes me recognize that something is true. And there is no further faculty, superior to the natural light, which can show that it is false. (It is important to notice that Descartes does not exempt divine revelation.)

The natural light would seem to be one of the powers or faculties of reason. In the Discourse, Descartes says that ". . . the power of judging well, and distinguishing the true from the false, which is properly what is called good sense or reason, is naturally equal in every man. . . ." ¹⁴ This passage is perhaps ironic, and we cannot be sure how seriously to take it as a characterization of reason. Nor do we know whether "the power of judging well" is to be equated to "distinguishing the true from the false," or whether these are two separate functions of the

"I recognize by the natural light," as though it is the power of the mind itself. In either case, the mind is that which recognizes the truth, and this is the important point.

Nelson, "In defence of Descartes," discusses the translation of this passage. The Latin text of what is here the last sentence begins with quia, "because," and Nelson takes this to show that Descartes is here attempting to justify or defend the faculty of reason. The French text, which I have here translated with painful literalness, uses simply et, "and." For our purposes, the important part is that there is no further faculty, by which the natural light can be judged. This does not depend upon the translation of the word in question. If anyone is interested in still more discussion of this passage, he may find it is my "Plea for the French Descartes," Dialogue, VI (1967), pp. 236-39.

¹⁴Discourse, I, AT, VI, p. 2.

reason. Since Descartes later identifies the power of judging as involving the will, it would seem that "reason" in this passage would have to involve the will, as well as the understanding. Descartes regularly contrasts judgments which are made by reason with those which follow simply from sense.¹⁵

Apparently reason involves something more than the immediate recognition of truth, when, for example, we judge that the true sun is much larger than a candle flame. This is not an immediate intuition, but a judgment based upon reasoning. It does not seem, then, that Descartes, even in this informal and possibly ironic passage, intends to equate reason with the ability to recognize truth and falsehood, although it includes this ability.

The Rules tell us that the natural light, as one of the functions of the reason, or of the mind taken as a whole, should be developed:

. . . if someone wishes to make a serious investigation of the truths of nature, he should seriously study to improve the natural light of his reason.¹⁶

This improvement requires a method, rather than the usual, disorganized groping of almost all chemists, most geometers, and more than one philosopher: ". . . by

¹⁵Dioptrics, VI, AT, VI, p. 144; Discourse, IV, AT, VI, pp. 39-40.

¹⁶Rules, I, AT, X, p. 361.

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disorderly studies of this sort, and by obscure meditations, the natural light is confused and our minds are blinded."¹⁷ But this method cannot be extended to the simplest operations, intuition and deduction, in which we "see" immediately. Rules of logic "are useless here, or rather are to be considered hindrances, because nothing can be added to the pure light of reason which does not in some manner obscure it."¹⁸ And ". . . there are no paths to the certain knowledge of truth open to man except evident intuition and necessary deduction . . ." which are compared with the "perception of the eyes."¹⁹

"Natural light" does not seem to be a technical term in the Discourse, where the expression appears only once: ". . . I learned to believe nothing too firmly of that to which I had been persuaded only by example and by custom, and thus I delivered myself little by little from many errors, which can obscure our natural light, and render us less capable of understanding reason."²⁰ Again, as in the Rules, the precise relationship of the natural light to the faculty of reason is not clear.

The role of the term "natural light" in the earlier works, however, has left us quite unprepared for the part

¹⁷Rules, IV, AT, X, p. 371.

¹⁸Rules, IV, AT, X, pp. 372-73.

¹⁹Rules, XII, AT, X, p. 425; Rules, IX, AT, X, p. 400.

²⁰Discourse, I, AT, VI, p. 10.

that it is to play in the Meditations. Here it becomes the name of a faculty which provides us with a source of knowledge which is not subject to the machinations of the evil genius.

The role that this knowledge plays is critical. It makes it possible to give a proof of the existence of God which is not, like that of d'Ailly, simply probable. God's existence is known with certainty. It is more certain, as Descartes repeatedly claims, than the certainty with which we know the eternal truths of mathematics.²¹

In order to establish this level of certainty, we require a faculty or power which is immune to doubt, even to the extreme doubts which threaten the truths of geometry and arithmetic. The natural light provides this level of certainty.

In the Meditations, Descartes claims that the natural light shows us the principle of causality, upon which his proof of the existence of God is based:

Now it is a thing which is manifest by the natural light that there must be at least as much reality in the efficient and total cause as in its effect: for where can the effect draw its reality, if not from its cause? and how would that cause be able to communicate it to the effect, if it did not have it in itself?

And thence it follows, not only that nothing [le néant] would not be able to produce anything, but also that that which is more perfect, that is,

²¹To Mersenne, Feb. 27, 1637, AT, I, pp. 350-51; to Mersenne, Nov. 25, 1630, AT, I, pp. 181-82; Discourse, IV, AT, VI, pp. 36-38.

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which contains in itself more reality, cannot be a descendant and a dependent of the less perfect. . . .
 . . . the natural light makes me recognize with certainty [évidemment] that ideas are in me like pictures, or images, which, surely, can easily be inferior to the perfection of the things from which they have been derived, but which cannot ever contain anything greater or more perfect.²²

As we will see in more detail when we discuss the fourth Meditation, false ideas are those which are lacking in some respect. They may be said, then, to "contain nothingness," in the sense in which an uncompleted picture might have blank areas within its borders. Descartes says that he recognizes this principle--that ideas cannot be more perfect than their objects--by the natural light.

Concerning false ideas, he says, ". . . if they are false, that is, if they represent things which are not, the natural light makes me recognize that they procede from nothing, that is, that they are in me only because something is lacking in my nature, and because it is not completely perfect."²³

The two causal principles here serve as axioms in the proof of the existence and veracity of God. The first tells us that an effect cannot be more perfect than its cause, and the second says that error cannot proceed from a perfect being, but comes from nothing.

²²Meditations, III, AT, IX, pp. 32-33.

²³Meditations, III, AT, IX, p. 35.

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Although Descartes refers to the natural light as the source of other principles, which he also holds to be indubitable, it is to these causal principles that he refers again and again, in the Objections and Replies, and in his correspondence. Later, I want to suggest that all these causal principles really reduce to a single principle, that "nothing comes from nothing."

In contrast, it is interesting to notice the many ways in which Descartes has not used the term "natural light." He has not used it, for example, to refer to the source of our knowledge of the principles of geometry and arithmetic, or the frequently-repeated truism that "there is no mountain without a valley." Although we seem to know that two and three equal five, Descartes does not say that we know it by the "natural light." And Descartes has not used the natural light to validate the existence of external objects. Instead, as we have seen, he contrasts the natural light, by which he recognizes truth and falsehood, with the natural inclination to believe, "a blind and rash impulsion," which led him to believe in the existence of an external world.²⁴

We will have to ask why there is this difference. If some principles can be validated by an appeal to the natural light, why can't all principles be so validated? Why can't we say, for example, "It is manifest by the

²⁴Meditations, III, AT, IX, p. 31.

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natural light that God exists, that all mathematics is true, and that the physical sciences provide valid knowledge"? If we could, it would save all the trouble of metaphysical speculation, and of philosophical analysis generally. We want to know, then, what makes the natural light a reliable instrument in the search for truth, in a sense in which our natural inclinations are not.

Descartes gives an explanation in a letter to Mersenne, written in 1639, while Descartes was still writing his Meditations.²⁵ He is discussing Herbert of Cherbury's De veritate:

The author takes universal consent as the rule of truth for him; as for me, I have only the natural light as my rule of truth; for since all men have the same natural light, it would seem that they should all have the same notions; but, on the contrary, there is hardly anyone that uses that light well, and it therefore follows that many (for example, all the people we know) can consent to the same error; and there are many things which can be recognized by the natural light, upon which no one has ever yet reflected.

He would like us to follow, above all, natural instinct, from which he derives all of his common notions; for me, I distinguish two sorts of instincts: one is in us insofar as we are men and is purely intellectual; this is the natural light or intuitus mentis, which I believe to be the only thing which should be trusted; the other is in us insofar as we are animals, and is a certain impulsion of nature for the conservation of our body, for the enjoyment of corporeal pleasures, etc., which ought not always to be followed.²⁶

²⁵They were completed in May, 1640. Cf. Adrien Baillet, La vie de Monsieur Des-Cartes, II, p. 103, quoted in Alquié, OP, II, p. 171.

²⁶To Mersenne, Oct. 16, 1639, AT, II, pp. 597-99.

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Descartes regularly rejects universal consent as a rule of truth. His arguments here seem decisive: Many persons can consent to the same errors, and there are truths which have not yet been discovered. In neither case would an appeal to the consensus yield the truth.²⁷

In the second passage, he identifies the natural light with "intuition of the mind." But we are not entirely sure, at this point, of the meaning of that term. We will have to ask what "intuition" means in Descartes' writings.

He does include a definition of "intuition" in the Rules:

By "intuition" I understand, not the fluctuating faith in the senses, nor the false judgment of badly constructed imaginings, but the conception of the pure and attentive mind which is so simple and distinct that we can have no further doubt as to what we understand; or, what amounts to the same thing, an indubitable conception of the unclouded and attentive mind which arises from the light of reason alone, and is more certain than deduction itself, even though we have noted above that human beings cannot make errors in deduction. Thus everyone can intuit in his mind that he exists, that he thinks, that a triangle is bounded by three lines, that a sphere has only one surface, and other similar things, of which there are many more than most people notice because they disdain to consider such simple matters.

For the rest, lest anyone should be disturbed by this new usage of the word "intuition" and of other words which I am similarly forced to use in an uncommon sense in the following pages, I give notice that in general I pay no attention to the manner in which words are made use of in these recent times

²⁷Cf. Discourse, II, AT, VI, p. 16; Rules, III, AT, X, p. 367.

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in the schools, because it would be very difficult to use the same meanings when the inner conception is so different.²⁸

When Descartes identifies "natural light" with "intuition of the mind" in the letter to Mersenne, it is not clear that he is thereby identifying it with this definition of "intuition" in the Rules. The Rules were never published, and there is no evidence that Mersenne had seen them.²⁹ In addition, the word "intuition" dropped out of Descartes' vocabulary after the time of the Rules. He does not use it at all in the Discourse or the French Meditations, and only very rarely elsewhere.

And he does not seem to have substituted the term "natural light" for the term "intuition" in the Meditations.³⁰ The two words have different meanings. In the Rules, the

²⁸Rules, III, AT, X, pp. 368-69.

²⁹The Rules were found in manuscript form among Descartes' papers after his death in 1650. They were assembled by Chanut, the French ambassador to Sweden, and sent to Clerselier, Descartes' friend and translator. He sent them to Arnauld and Nicole, to Nicolas Poisson, perhaps to Malebranche, then to J. B. Legrand, who loaned them to Baillet, Descartes' biographer. Portions of the Rules appear in the second edition of the Port-Royal Logic, in 1664, but not in the first edition (1662). The Rules were finally published in 1701. The evidence thus strongly suggests that the Rules were not known, even to Descartes' friends, until after his death.

See OL, pp. 35-36 and OP, pp. 69-71.

³⁰Laporte, however, believes that "natural light" is the term which Descartes uses in later writings to replace "intuition." Laporte, Rationalisme, p. 6.

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role of intuition is described as "conception" (Latin conceptio), but the role of the natural light is always "recognition" (cognitio). Again, the intuition is said, in the Rules, to be a conception which "arises from" the light of reason, which would suggest that the intuition is not identical to the light itself. Finally, and most important for our purposes, we are said to be able to "intuit" our existence, our present thinking, and certain geometrical truths. As we have seen, neither the Meditations nor any other writing of Descartes uses the term "natural light" in connection with our knowledge of mathematical truths.

This suggests that the analysis of knowledge in the Rules is different from that of the Meditations at this point, and that we cannot use the definition of "intuition" in the Rules to explain the meaning of "natural light" in the later writings.

Although Descartes did not often use the term "intuition" in his later writings, he was asked a question in 1648 by an unknown correspondent, probably the Marquis of Newcastle, which gave him the occasion to explain what it might mean to him.

He was asked to explain the sort of knowledge we will have from God in the next life. Descartes explains that this knowledge will be intuitive:

Intuitive recognition [connaissance] is an elucidation [illustration] of the mind, by which it sees, in

the divine light, the things which it pleases God to disclose to it by a direct impression of the divine light [clarté] upon our understanding, which in that respect is not considered as active, but solely as receiving the rays of divinity. But all the recognitions which we can have from God, without miracle, in this life, descend from reasoning, from the progress of our discourse, which deduces them from the principles of the faith, which is obscure, or come from natural ideas and notions which are in us, which, however clear they may be, are only crude and confused upon such a high subject [divine blessedness]. To the extent that what knowledge we have or acquire by the route that our reason takes has, first, the obscurity of the principles from which it is drawn, and moreover, the uncertainty which we experience in all our reasonings.

Compare, now, these two sorts of knowledge, and see if there is anything similar, in that troubled and doubtful perception, which cost us so much work and which we enjoy only for a moment after we have acquired it, to a pure, constant, clear, certain, painless, and ever-present light.

But can you doubt that our mind, when it is detached from the body or when this body is glorified and no longer acts as an impediment to it, is not able to receive such direct elucidations and recognitions when, in this body itself, the senses give it corporeal and sensible things, and that our soul has already some of them from the beneficence of its Creator, without which it would be incapable of reasoning? I avow that they are somewhat obscured by the mixture of mind and body; but still these elucidations give us a primary, gratuitous, certain recognition, which touches us in the mind with more confidence that we give to the testimony of our eyes. Would you not admit to me that you are less assured of the presence of the objects which you see, than of the truth of the proposition: "I think, therefore I am"? But that recognition is not a work of our reasoning, nor an instruction which your masters have given you; your mind sees it, senses it, and touches it [la manie]; and while your imagination, which is mixed intrusively in your thoughts, diminishes the clarity of them, wishing to clothe them in its figures, it is nevertheless a proof of the capacity of our souls to receive an intuitive recognition from God.³¹

³¹To the Marquis of Newcastle (?), Mar. or Apr., 1648, AT, V, pp. 136-38.

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The characterization of intuition here seems to be closer to that of the natural light in the Meditations than is that of the Rules. If we consider only intuition as it occurs in normal existence, not in the after-life, we find that it is an elucidation (illustration had this sense in classical French) of the mind by God giving "primary, gratuitous, certain recognition." The cogito is given as an example of such knowledge, while in the Meditations, the cogito was said to result from the operation of the natural light.³² And, quite unlike the Rules, these passages from the letter to Newcastle do not claim that mathematics and natural reasoning are certain. On the contrary, they are obscure, uncertain, troubled and doubtful, in comparison with pure intuition.

Descartes, then, has given two characterizations of "intuition," one in the Rules, and the other in the letter to Newcastle. Since Mersenne probably had not seen the Rules and could not have seen the letter, we should be hesitant about basing any argument upon the assumption that "intuition of the mind" in the letter to Mersenne is equivalent to "intuition" in either of the other writings.

In the letter to Mersenne, Descartes also distinguishes two types of instinct, one bodily and the other mental. The "natural tendency to believe" depends in part

³²Meditations, III, AT, IX, p. 30.

upon the body, but the "natural light" is a purely mental instinct.

This is an important passage for our study of the nature of certainty in Descartes. There is a whole series of mind-body counterparts, in which an operation or power of the mind is said to be comparable to an operation of the body. For example, there is a corporeal memory, consisting of patterns impressed upon the brain, which has its counterpart in the purely intellectual memory in the mind.³³ Sensations, in the form of movements and vibrations of the animal spirits, and of tuggings on the ends of nerve fibers, have their counterpart in the mental process that accompanies sensation. The passions, which are bodily, have their counterparts in the emotions, which are mental. Similarly, we find, implicitly in the Meditations and explicitly in this letter to Mersenne, that there are two sorts of instincts, bodily and mental, which are the "natural tendency to believe" and the "natural light." We can characterize the natural light, then, as a mental instinct.

If we consider only our present thoughts, there is no error. The sensation of pain, as a pure sensation, is neither true nor false. It is when we judge that the pain

³³L'homme, AT, XI, p. 174; Discourse, V, AT, VI, pp. 55-56; to Mersenne, Nov., 1632, AT, I, p. 263; to Mersenne, April 1, 1640, AT, III, p. 48; to Mersenne, June 11, 1640, AT, III, pp. 84-85; to Mersenne, Aug. 6, 1640, AT, III, p. 143; to Huygens, Oct. 10, 1642, AT, III, p. 580.

is in a leg or an arm that we may make an error. Errors, particularly the errors that we carry with us from childhood, seem to be due to the close connection of our mind with our body.³⁴ If error is usually associated with the mixture of soul and body, rather than with the pure soul alone, then we have part of the theoretical justification of the inerrancy of the natural light. We would say that the natural light is a power of the pure mind, uncorrupted by association with the body.³⁵

³⁴Principles, I, 71, AT, IX2, pp. 58-59.

³⁵"... things which belong only to the mind alone . . . which I recognize by the natural light, without the aid of the body . . ." Meditations, VI, AT, IX, p. 65. Cf. to Regius, May, 1641, AT, III, p. 375; Meditations, VI, AT, IX, p. 70; to Mersenne, Feb. 27, 1637, AT, I, p. 350.

Descartes attempts to clarify his position in response to a question from Burman, who raises an objection to the following passage from the third Meditation: "If I considered ideas only as certain modes or fashions of my thought, without wishing to connect them to some other, exterior thing, they could scarcely give me occasion for failing." Meditations, III, AT, IX, p. 29. Burman objects: "But, as every error in the ideas comes from their relation and their application to exterior things, it seems that there would be no material for error if one did not connect them with exterior things." Descartes replies: "There is nevertheless material for error, even if I do not connect them to anything outside myself, because I might be deceived in their nature itself, for example, if I considered the idea of color and if I were to say that it is a thing, a quality, or rather that the color itself which was represented by that idea is something similar to it: for example, if I were to say that white is a quality, even if I did not connect that idea to anything outside myself, and if I said or supposed that there was no white object, I would nevertheless be deceived with reference to an abstraction, the whiteness itself and its nature, or its idea." Burman, AT, V, p. 152.

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Descartes' use of the term "natural light" in the Meditations led to a number of discussions of its supposed revelations in Descartes' correspondence and in the Objections and Replies.

He often uses the term, in these later writings, to refer to secular knowledge, as distinguished from that of faith. For example, he tells Mersenne that we cannot know the Trinity by means of secular reasonings:

As for the mystery of the Trinity, I judge, with St. Thomas, that it is purely a matter of faith, and cannot be recognized by the natural light. But I do not deny that there are things in God which we do not understand, just as even in a triangle there are many properties which no mathematician will ever know, even though that does not prevent our knowing what a triangle is.³⁶

There are a fairly large number of references to the natural light of this general sort, using the term to distinguish secular reasoning from the light of faith or revelation, from tradition, from Scholastic instruction, and so on. This is probably the meaning of the subtitle to The search after truth by the natural light. That is, the search is to be conducted without an appeal to traditional learning or revelation.³⁷

In this passage, then, Descartes says that we can be deceived in the judgments that we make concerning our ideas. Thus, although the body may be a primary source of error, it is not the only source of error.

³⁶To Mersenne, Dec. 31, 1640, AT, III, p. 274. Cf. Aquinas, Summa Theologica, I, Q. 32, 1.

³⁷Search, AT, X, pp. 495-496, 498-499.

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For religious reasons, Descartes believes that the light of faith is the source of a knowledge which is, in some sense, superior to that of the natural light. Thus, the Catholic will "prefer the light of grace to that of nature."³⁸

The term "natural light," then, is sometimes used simply to contrast natural knowledge with that derived from other sources. But the typical, technical use of the term in the Meditations and in the Objections and Replies is as

³⁸To *** ("Hyperaspistes"), Aug., 1641, AT, III, p. 426. Cf. Rules, III, AT, X, p. 371; to ***, Aug., 1638, AT, II, p. 347; to Mersenne, Dec. 31, 1640, AT, III, p. 274; Meditations, Summary, AT, IX, p. 11; to Mersenne, Mar. 18, 1641, AT, III, pp. 334-35; Replies, II, AT, IX, p. 116; Search, AT, X, p. 506; HR I, p. 323.

The relationship between faith and natural reason troubled Descartes intensely, from the time of the condemnation of Galileo to the end of his career, as his correspondence with Mersenne concerning Le monde testifies. See, especially, to Mersenne, Dec., 1640, AT, III, p. 259: "Believing very firmly in the infallibility of the Church, but also not doubting my reasons, I cannot fear that one truth is contrary to the other."

A later opinion is this: ". . . we ought to demonstrate that the truths of theology are not opposed to the truths of philosophy, but we ought not to criticize them in any manner. It is thus that the monks have given birth to all the sects and to all the heresies, by their theology, that is, by their scholastic, which ought to be destroyed before anything else. And what need is there of such a great effort, when we see simple persons and rustics able to gain heaven as well as we. . . ." Burman, AT, V, p. 176. If I understand this outburst correctly, it says that (1) the truths of theology do not conflict with those of philosophy, (2) philosophers should refrain from discussion of theological problems, and (3) faith does not require reason for its support. Such views bring Descartes very close to Pascal.

The difficulty comes, of course, when faith and reason both deal with the same subject matter, as they do in connection with the Genesis story. Descartes admits that he does not understand the meaning of Genesis, which

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For example, in the first Reply, Descartes relies heavily upon the natural light for a more detailed description of the causal process:

. . . the natural light does not tell us that the efficient cause must precede its effect in time . . . But the natural light certainly tells us that there is nothing about which it cannot be asked, why it exists. . . . it is very manifest, by the natural light, that that which can exist by its own force, exists always . . .³⁹

In the replies to Arnauld, Descartes refers to the natural light as the source of our knowledge of certain causal principles. Descartes appears to have taken Arnauld's criticisms seriously, and his replies are careful and detailed. Concerning the claim that God is the cause of himself, Descartes says:

. . . the natural light makes us recognize that the thing of which the essence is so immense that it does not have need of an efficient cause for being, does not also have need for one in order to have all the perfections of which it has the ideas, and that its own essence gives it eminently all that which we are able to imagine to be given to other things by the efficient cause.⁴⁰

Descartes goes on to describe the causal process in some detail. What is important for our purposes here

he finds as difficult to interpret as the Song of Songs or Revelation, and which he tentatively regards as metaphorical. For his curious exegesis see Burman, AT, V, pp. 168-69.

³⁹Replies, I, AT, IX, pp. 86, 94.

⁴⁰Replies, IV, AT, IX, p. 186.

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is to notice that the knowledge or recognition which is revealed to us by the natural light is never subjected to the hyperbolic doubt of the Meditations. And its revelations are not particularly simple or obvious. I find it much easier to believe that two and three make five, than to believe the complex, detailed description of the causal process in the fourth Reply. But it is the causal principle, and not the arithmetic theorem, which is revealed by the natural light. In particular, the natural light is said to show us precisely those principles which are required to establish the existence and veracity of God.

We have seen a number of passages in which Descartes has used the term "natural light." I think that it will help to make his rather special use of this term clearer if we also consider two passages in which the French and Latin versions differ in their use of the term.

Consider this passage from the French edition of Objections and Replies, VII. Descartes seems to say that it has been his aim to "set forth what had occurred earlier to myself, and that which ordinarily occurred to others, letting the natural light be the guide, whether those opinions were true or false."⁴¹ Apparently, Descartes is saying here that the natural light is the source of "opinions," and that these opinions can be either true or false. If this is what he actually said, then the "natural

⁴¹Replies, VII, OP, II, p. 983.

light" may be the source of uncertain beliefs. Actually, however, this passage occurs in that part of the Objections and Replies which was translated by Clerselier without Descartes' approval and published against his will. The term "natural light" does not appear in the Latin original, which was the only version that Descartes ever saw.

On the other hand, the Latin version of the Principles contains this passage: ". . . we must keep in mind what has been said, that we must trust to the natural light only so long as nothing contrary to it is revealed by God Himself."⁴² In the French version, however, which Descartes himself extensively revised, this is rephrased, the reference to the natural light is eliminated, and the passage is completely reworked: ". . . we will be assured, by those of his attributes of which he has wished us to have some recognition, that that which we will have once clearly and distinctly conceived to belong to the nature of these things, has the perfection of being true." Whatever may have been Descartes' motive in rewriting this section, it is clear that he has eliminated all suggestion that the natural light might reveal something contrary to divine revelation and therefore false.

I believe that these passages are the only places in the entire corpus of Descartes' work in which it is said

⁴²Principles, I, 28, HR, I, p. 231.

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In the Meditations, the Objections and Replies, and the correspondence related to them, then, the term "natural light" seems to have the following characteristics:

(1) It is a faculty or power which leads to recognition (connaissance) or knowledge in the sense of recognition.

(2) As the vis cognoscens, it is a function of the understanding. It contrasts with the vis intelligens, or "power of conceiving," which is another function of the understanding. The natural light recognizes ideas, while the power of conceiving typically forms ideas or concepts, including those which derive ultimately from the senses, as well as those which are innate.

(3) More specifically, it is the power of recognizing truth and falsehood. We may thereby obtain "recognition of the truth" (connaissance de la vérité), a phrase which is often repeated in the Discourse and the Meditations.⁴³

(4) Of the truths which are recognized by the natural light, none are more frequently mentioned than a group of causal principles which are used in establishing the existence and veracity of God.

⁴³Discourse, AT, VI, pp. 27, 30, 67, 70, 78; Meditations, AT, IX, pp. 17, 18, 29, 50.

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Descartes seems to have found, in the faculty or power which he calls the "natural light," a source of knowledge which will meet the arguments of the sceptics. The knowledge that comes through recognizing by the natural light does not require some further justification. It functions as an ultimate source of our recognition of the truth.⁴⁴

⁴⁴I understand that a discussion of the natural light which is similar to that developed in this chapter appears in Anthony Kenny, Descartes: a study of his philosophy (New York: Random House, 1968).

CHAPTER V

THE POLEMICAL ARGUMENTS

We will want to ask whether Descartes really succeeded in the job of refuting the sceptics. As we will see, some of his critics have maintained that he argued in a vicious circle, and that he did not therefore have an effective reply to a determined sceptic. I want to return to this question in more detail in a later discussion of the so-called "Cartesian circle." For the present, I want to continue to trace the use of the term "natural light" from the time of the Meditations to the final, puzzling doctrine of the Principles, and then to suggest several polemic purposes that the doctrine serves.

As we turn now to the Principles, we find that Descartes, even more explicitly than in the Meditations, maintains that the demonstrations of mathematics may be called into doubt:

Why one may also doubt the demonstrations of mathematics.

We will also doubt all the other things which have previously seemed to us to be very certain, even the demonstrations of mathematics and its principles, even though in themselves they are quite manifest, because there are men who do not deign to reason about such matters; but principally because we have heard it said that God, who has created us, can do everything that he wishes, and that we still do not know

if perhaps he has not wanted to make us such that we are always deceived, even in the things which we think that we recognize best; for, since he might have permitted us to be deceived sometimes, as has already been noted, why could he not permit us to be deceived always? . . . ¹

If the principles of mathematics are open to doubt, are the principles of causality also open to doubt? If we can be deceived about the things that we think we know best, can we also be deceived about the revelations of the natural light? Is the natural light also subject to the distortions of the machinations of an evil genius? Unfortunately, yes. Or yes and no. The Principles do not seem to give a consistent answer to these questions. On the one hand, in the Principle which follows the one we have just seen, we are assured:

That we have a free will such that we can abstain from believing doubtful things, and thus keep ourselves from being deceived.

But while he who has created us is all-powerful, and even though he might take pleasure in deceiving us, we nevertheless experience in ourselves a freedom which is such that, every time that we want to, we can abstain from believing the things which we do not recognize in the proper manner [bien, well], and thus keep ourselves from every being deceived.²

On the other hand, we may be deceived in those matters that we believe ourselves to know best. If this is the case, then there is no way whatever to avoid the possibility of deception. Or, rather, we can avoid deception if and only if we refrain from giving our assent

¹Principles, I, 5, AT, IX2, pp. 26-27.

²Principles, I, 6, AT, IX2, p. 27.

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to any matter whatever. But this is scepticism pure and simple, precisely the position which Descartes is attempting to undermine.

Since it is not at all likely that Descartes is attempting to justify a kind of ultimate scepticism here, we will have to re-read these passages with some care, to find out what he is trying to do.³

In the first passage, we have heard that we can be deceived even about the things which we think that we know best, including the demonstrations of mathematics. In the second, we should believe only the things that we recognize in the right way. Apparently, then, an all-powerful God could not deceive us about the things that we recognize in the proper way. If this is so, then the word "think" in "think that we know" would have the meaning of "only think," "believe improperly." Thus, the first passage would mean that we would have to say that God might deceive us about those things that we think (incorrectly) that we know, but which we do not recognize or know properly (i.e. with knowledge of God's veracity). These would include mathematical demonstrations, but they would not include the revelations of the natural light, such as the causal principles.⁴

³On Descartes' anti-sceptical motives, see, e.g., Replies, VII, AT, VII, pp. 544-50. See also Popkin, History of Scepticism, ch. 9.

⁴Cf. the fifth Meditation: "Will someone say to me that previously I have held many things as true and

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I think that the text of the Principles can be interpreted in this way, at this point, but such an interpretation is plausible only if we know that Descartes was not advocating scepticism.

I am unable, however, to offer any interpretation of the following passage in the Principles which will avoid the possibility of a sceptical outcome:

And that as a consequence everything is true which we recognize clearly to be true, and this delivers us from the doubts which were proposed above.

From which it follows that the faculty of recognizing which he has given us, which we call natural light, never perceives any object which is not true in so far as it perceives it, that is, in so far as it clearly and distinctly recognizes it; because we might otherwise believe that God was a deceiver, if he had given it to us such that we took the false for the true when we used it correctly. . . .⁵

The argument has gone something like this, both in the Meditations and in the Principles: The natural light shows me that the more perfect cannot come from the less perfect. I have an idea of a perfect God, and I know that I, and my ideas, exist. Such an idea could come only from a perfect being, and therefore such a being exists. By the natural light, error and deception cannot come from a perfect being. Therefore error and deception do not come from God. The natural light is given to us by God. And

certain, which I have afterward recognized to be false? But I have not recognized clearly or distinctly any of those things . . ." Meditations, V, AT, IX, p. 56; Cf. Replies, V, 4, 4, AT, VII, pp. 378-79; Replies, VII, 2, AT, VII, pp. 472-73.

⁵Principles, I, 30, AT, IX2, p. 38. "Perceives" here translates aperçoit.

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therefore the natural light, or the faculty of recognizing, can never disclose to us anything which is not true, because God would otherwise be a deceiver. And therefore we are assured that the causal principles are true.

But let us assume that our faculty of recognizing, or natural light, is faulty, in such a way that we sometimes take the false for the true, even when we use it correctly. In particular, let us assume that Descartes is mistaken when he thinks that he recognizes the truth of the causal principles. Then it may be that Descartes' idea of a perfect being does not require a perfect being as its cause. It is therefore possible to assume that there is no true God, and that all our supposed knowledge is the work of an evil genius. There is nothing left of the primary metaphysical argument of the Meditations.

But we can scarcely leave Descartes at this point. It seems to me that the Principles were altogether a careless and hasty piece of work, and that Descartes gave no more thought to the details of his argument here than he did to the implausible and incoherent laws of motion in the third part of that work. (We will discuss those "eternal truths" and "moral certainties" in later sections.)

If Descartes' argument is not to lead to a disastrous scepticism, then there must be some criterion which does not require a further criterion for its support. If we can exclude the single passage from the Principles

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which seems to indicate that we can be mistaken even when we use our natural light correctly, then this faculty would seem to be exempt from doubt.

But a faculty is not a criterion. We must know what it means to use this faculty "correctly" or "well."

Descartes is far from clear in his explanation of what it means to use the understanding "correctly." His arguments sometimes seem to rely on the polemical claim that his opponents do not really doubt what they pretend to doubt. On the other hand, one or two lines of attack seem to have more than merely polemical value.

It seems to me that there are four principal ways in which Descartes has attempted to locate an area of certainty, which the sceptic cannot or will not doubt.

(1)

The first two ways are related. Essentially, they are not so much attempts to locate a positive ground of certainty, but arguments to show that criticism has no ground to stand on. The first of these is directed against the atheist. It says something like this: We know that an effect cannot have more perfection than its cause. But the atheist claims that the cause of his existence is not God. Therefore, the cause of his existence is something less than infinite perfection. To the extent that his cause is imperfect, to that extent the atheist's reasoning may be imperfect.

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Descartes states this argument as follows:

. . . And if we want to pretend that an all-powerful God is not the author of our being, and that we subsist by ourselves or by some other means, of which we will suppose the author less powerful, we will always have so much the more reason for believing that we are not so perfect that we could not be continually deceived.⁶

Thus an atheist is unable to avoid the suspicion that he may be deceived.

In the second Reply, Descartes says that an atheist can know nothing with certainty,

. . . because every form of knowledge which can be rendered doubtful ought not to be called science; and since he is supposed to be an atheist, he cannot be certain of not being deceived in the things which seem to him to be very evident, as I have already shown above; and even though that doubt does not ever come into his thoughts, it can nevertheless come into them if he examines them, or if it is proposed to him by another, and he will never be out of the danger of doubt, if he does not first recognize a God.⁷

A letter to Regius emphasizes this position:

You say in the second objection that "the truth of axioms that are understood clearly and distinctly is manifest in itself." I agree also, for all the time that they are clearly and distinctly comprehended, because our soul is of such a nature that it cannot refuse to agree to that which it comprehends distinctly; but because we often remember conclusions which we have derived from such premisses, without paying attention to the premisses themselves, I say that then, without the knowledge of God, we can pretend that they are uncertain, even though we remember that we have derived them from principles that are clear. Actually, our nature is such that we are deceived in these things which are most evident, and as a consequence that we do not have a true science, but a simple

⁶Principles, I, 5, AT, IX2, p. 27.

⁷Replies, II, AT, IX, p. 111.

persuasion, even at the moment when we have derived them from these principles; I use this to make a distinction between persuasion and science.⁸

This is rather an important text in opposition to the claim, advanced by Willis Doney and others, that Descartes held that only memory was subject to the deceptions of the evil genius.⁹ Plainly, here, he is saying that it is not only memory but also "those things which are most evident" which are subject to deception.

For our present purposes, however, it is important to notice that the form of these arguments is polemical. If someone attempts to maintain an atheistic position, Descartes is saying, then he will be able to know nothing with certainty. Such an argument as this will not affect an agnostic sceptic, who might well be willing to consider all knowledge as doubtful.¹⁰

(2)

A second argument against scepticism is also polemical in form. It says that the sceptic must assume the truth of certain principles if the sceptical position is to carry any weight. If the truth of these principles

⁸To Regius, May 24, 1640, AT, III, pp. 64-65.

⁹Doney's position is considered in the chapter on the Cartesian circle.

¹⁰For further discussion of the position of the atheist, cf. Replies, II, AT, IX, p. 110; Replies, III, AT, IX, p. 152; Meditations, V, AT, IX, pp. 55-56; Discourse, IV, AT, VI, pp. 38-39; Meditations, I, AT, IX, pp. 16-17; Replies, VI, 4, AT, IX, p. 230.

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may be assumed, then the Cartesian argument for the existence of God will hold.

This, I think, is the purpose of a passage in the Meditations to which I have already referred. Speaking of natural light, Descartes contends that:

. . . I do not have any other faculty, or power, in me for distinguishing the true from the false, which would be able to teach me that what that light showed me as true was not true, and in which I could trust more than in it.¹¹

In other words, if the natural light could be called into doubt, then there would be nothing in which anyone, even the sceptic, could trust.

Again, in the seventh set of Replies, Descartes points out that the sceptics do have a practical belief in some things:

. . . all those who are sceptics today do not doubt, when it comes to practice, that they have a head, and that two joined with three makes five, and similar things; but they say only that they make use of them as if they were true things, because they seem to them to be true; but that they do not believe them to be certainly true, because they are not completely persuaded and convinced by certain and invincible reasons.¹²

Even the sceptic, then, requires a kind of practical, everyday knowledge.

Descartes' argument against such sceptics is most clearly stated in the second set of Replies:

¹¹Meditations, III, AT, IX, p. 30.

¹²Objections and Replies, VII, AT, VII, p. 549.

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But, among these things [which the mind conceives clearly and distinctly], there are some which are so clear and at the same time so simple, that it is impossible for us to think of them without believing them to be true: for example, that I exist whenever I think; that things which have once been done cannot not have been done, and other similar things, of which it is manifest that one has a perfect certainty.

For we cannot doubt those things without thinking of them, but we cannot ever think of them without believing that they are true, as I have just said; therefore, we cannot doubt them without believing that they are true; that is, we cannot ever doubt them.¹³

A hardened sceptic, I think, might be able to withstand this argument, if he is willing to claim that even these apparent truisms can be doubted. Such a sceptic might wish to claim that human reason is so fallible that the most obvious tautologies can be false. By forcing the sceptic to this extreme position, Descartes might score a polemical point, but he would not have proved the ultimate sceptic wrong.

(3)

In accusing Descartes of arguing in a vicious circle, many of his critics seem to have misunderstood another of his arguments against the sceptical position.

Laporte finds Descartes using the following method to escape from the accusation of circularity in the theory of knowledge:

. . . But nature does not justify these first precepts, which she gives us, because she could be deceptive. Their justification "depends" upon the

¹³Replies, II, 4, AT, IX, p. 114; cf. Replies, VII, 1, AT, VII, p. 464; Burman, AT, V, p. 145.

idea that we have of the human understanding and of its functioning. If that idea itself cannot be obtained except at the price of a "diligent," "industrious," and "exact" investigation, aren't we turning in a circle?--Descartes certainly saw the circle, and indicates to us the means of getting out of it. He invites us to form certain conceptions about what, in us or in the object, concerns the recognition of things, without bothering ourselves for the moment to find out if they correspond to the reality: it is enough that these "assumptions" are useful to his design. Thus the method, taken all together, and with all that it requires, can be proposed at first, but solely as a hypothesis: the hypothesis will then be legitimated by its success, that is, by the same truths which it serves to discover and to demonstrate.¹⁴

Laporte's discussion here is based primarily upon the eighth and twelfth Rules. As Beck has shown in detail, many of the methods described in the Rules are used in the metaphysical arguments of the Meditations.¹⁵ It may be, then, that the hypothetical method, which Laporte describes, is also used in the Meditations. In particular, it may be that the various causal principles are recognized as true by the natural light. These serve to prove that God exists, and that he is not a deceiver. Knowing this, we are able to explain why the causal principles are indubitable, which indeed they are, for Descartes. The existence and veracity of God, then, do not prove that the revelations of the natural light are true, but, knowing them, we understand why they are true. The atheist may have lingering doubts

¹⁴Jean Laporte, Le rationalisme de Descartes (Paris: Presses Universitaires de France, 1950), pp. 2-3. (Herein-after referred to as Rationalisme.)

¹⁵L. J. Beck, The method of Descartes, ch. 18.

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about the foundations of his knowledge. He cannot escape the suspicion that he is the victim of continuous deception. But the believer knows why his beliefs are true.

Such a move as this will not be much of a defense against a hardened sceptic. In the Discourse, Descartes was able to escape from the accusation of circularity by pointing out that some things--the observed results of experiments--were accepted as given. These known results could be shown to be entailed by a set of general principles or laws, which are assumed as hypotheses. Since the observational data can be inferred from the laws, the laws are thereby confirmed.

In the metaphysical derivations, however, the causal principles cannot be taken simply as hypotheses. They must be known to be true. We cannot take their consequences as known, because it is precisely these consequences that we are attempting to validate--namely, the existence and veracity of God, the existence of the external world, and the validity or truth of our clear and distinct conceptions. To avoid a circular argument in the Meditations, then, we cannot take the consequences as given. Rather, it is our first principles which must be given. But I think that a hardened sceptic might well claim that he doubts these first principles, and if he can do so, then the proof fails. What is required, then, is a set of first principles which cannot be doubted.

Descartes' metaphysical method might better be described as one in which universal doubt is assumed hypothetically, rather than hypothetical first principles or laws.

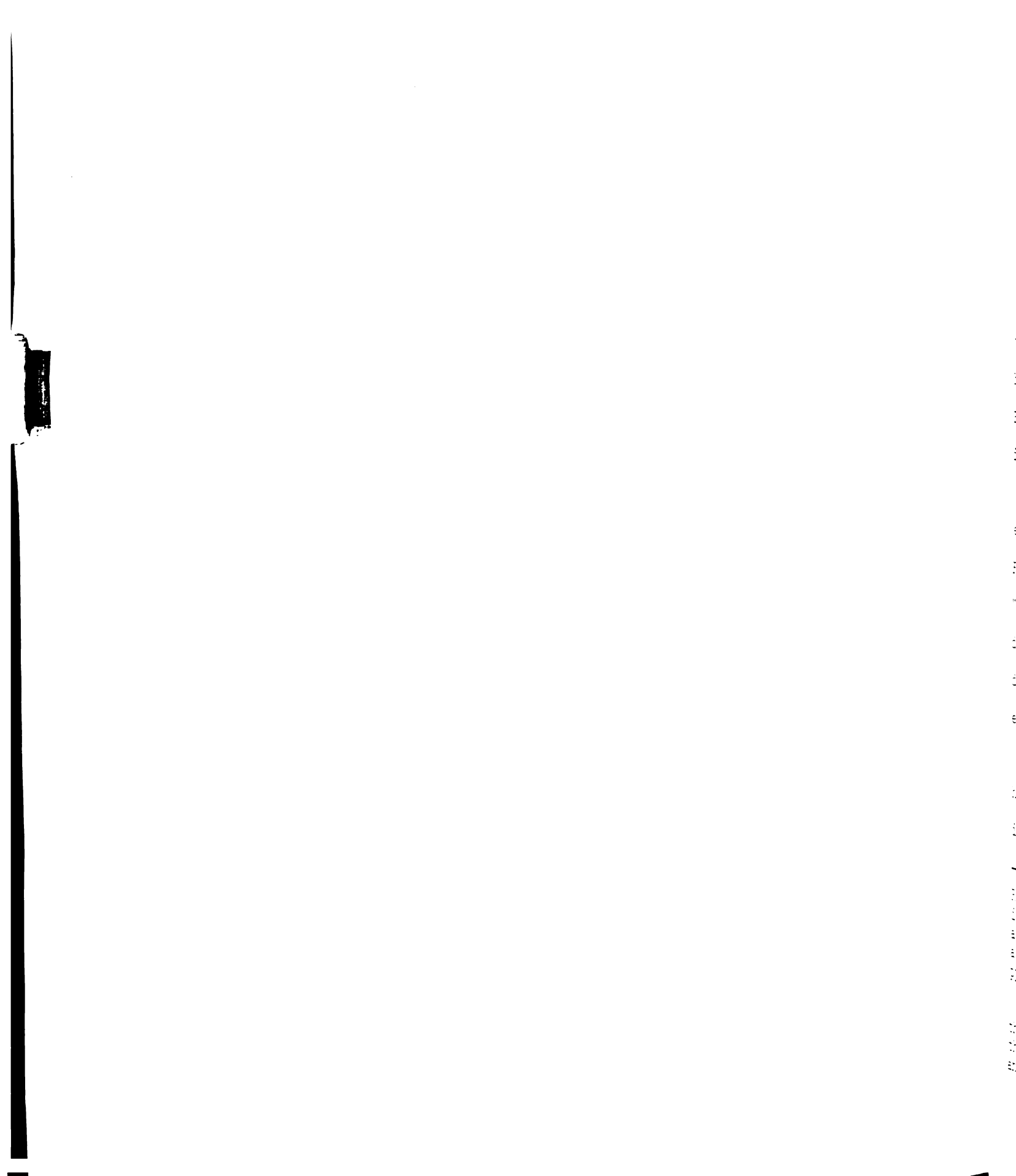
Laporte characterizes this "provisional doubt" or "methodic doubt" as follows:

. . . This doubt is surely the first fruit of the method, because it is the application of the first rule, prescribing that nothing must be "received for true" except that which can "never be called into doubt," thus to "reject" everything which can be, for any reason whatever, doubted; then, moreover, in order to motivate this, it was necessary to examine in order the diverse "foundations" of our cognitions, according to the procedures of "division" and of "enumeration" prescribed by the second and the fourth Rules. But this radical and universal doubt is not limited, like the $\epsilon\pi\omicron\chi\acute{\epsilon}$ of Husserl, to a suspension of judgment: it goes so far as to "deny" all the opinions previously taken as true. It is comprised of two moments: first, "to doubt all the things where we find the least suspicion of uncertainty," second, "to consider as false all those where we can imagine the least doubt."¹⁶

Descartes describes his initial rejection of previous beliefs as follows: "I thought that it would be necessary to reject as absolutely false everything in which I could imagine the least doubt," "It will be enough to reject all, if I can find in any some reason to doubt."¹⁷

¹⁶Laporte, Rationalisme, p. 14. Cf. Husserl, Ideas, sec. 32; Principles, I, 1-2, AT, IX2, p. 25.

¹⁷Discourse, IV, AT, VI, p. 31; Meditations, I, AT, IX, p. 14. Descartes does not always acknowledge this positive rejection of all doubtful opinions. In the



In the seventh set of Replies, Descartes compares his procedure to that of someone who wishes to eliminate the rotten apples from a basket full of them. One of the best ways of doing this will be to empty the basket, and then to place only the sound ones back in it.¹⁸

The method of the Meditations, then, resembles that of the Rules and Discourse in that we take an initial hypothesis and then attempt to derive its consequences. From these consequences, we can determine the truth of the initial hypothesis.

We take, then, as an initial hypothesis, the extreme claim of the sceptic, that all our beliefs are false. From the hypothesis, "I am doubting," we are able to derive "I am." From "I am doubting that I am," we can similarly derive "I am." There is therefore something which I cannot doubt, namely my own existence, since to doubt my existence entails my existence.

This suffices to refute the initial sceptical hypothesis, because it shows that there is something which is known with certainty.

Replies to Bourdin, he claims that some truths are retained, including those that are clear and distinct. The others are not, he says, rejected as false, but are simply taken as doubtful. Cf. Replies, VII, passim, e.g., AT, VII, pp. 460-61.

¹⁸Replies, VII, AT, VII, p. 481. Alquié finds that this is a poor analogy. The cogito is a conclusion from the process of doubt itself. "It is therefore a new truth, and of another order." OP, II, p. 982.

But this leaves us with a form of scepticism which is hardly more attractive than the ultimate scepticism with which we began. It is a kind of solipsism in which I regard all things, other than my own present thoughts, as false. We therefore require some additional truths, which must be known with certainty, if we are to escape from scepticism.

CHAPTER VI

THE COMMON NOTIONS

From the first to the last, Descartes maintains a class of objects and propositions which are known with certainty. In the Rules, they are called "simple" things, and in the Principles, "simple notions" or "first things," which are "objects of our conceptions."¹ Of these simple things or objects, I want to single out for particular attention those which he calls "common notions." These are the truths, revealed to us by the natural light, which are immune to the doubts of the sceptic, and which therefore may serve as what Descartes calls the "axioms" of his system.²

The expression "common notions" is a distinctively Stoic term, κοινὰ ἐννοιαί.³

¹Rules, XII, AT, X, p. 419; Principles, I, 47-48, AT, IX2, pp. 44-45.

²Replies, II, AT, IX, p. 127.

³Cf. Gerard Watson, The Stoic theory of knowledge (Belfast: The Queen's University, 1966), pp. 24-25. Watson finds this expression in Diogenes Laertius and Sextus Empiricus.

The question of Descartes' relation to the Stoics has been treated before, generally in terms of his ethics. See, e.g., Antoinette Virieux-Reymond, La logique et

l'épistémologie des Stoïciens (Chambéry: Editions "Lire", 1950?), p. 291: "The Stoic elements were integrated [in the system of Descartes] in an original synthesis, where the essential theses of Christian metaphysics are found. Descartes can be considered as the termination of neo-Stoicism, which is far from being Stoicism properly speaking." Commenting on the Cartesian ideal of self-development and the "provisional morality" of the Discourse (sec. III), the author continues: "This same [Stoic] influence is not less visible in the Cartesian theory of cognition, as Serrus justly remarks, the Cartesian theory of error rests upon a Stoic doctrine. Συνκατάθεσις, clearly has a connection with the "will" of Descartes. φαντασία for the Stoics, as for Descartes, is clear or obscure in itself (in the first case, it is φαντασία καταληπτική). But it is that only in itself, and it is necessary for the mind to give its assent to it." Some further parallels in the theory of knowledge are noted, but there is no direct evidence that Descartes was familiar with any of the Greek Stoics.

Alquié points out that, in the Discourse, it was the Stoic virtues that he was condemning when he declared that some moral principles were no more than "insensibility, pride, despair, or parricide." Discourse, I, AT, VI, p. 8; cf. Laporte, Rationalisme, p. 440. Laporte cites Descartes' correspondence with Balzac, in 1627-28, now lost, in which Descartes proposed certain anti-Stoic theses. Also note Zeno's admission that not even cannibalism, incest, or homosexuality are wrong in themselves. Von Arnim, Stoic. Vet. Frag., I, pp. 59-60, cited in Frederick Copleston, A history of philosophy (8 vols.; Garden City, N. Y.: Image Books, 1946-63), vol. I, pt. 2, p. 140.

I am unable to find any major points of resemblance, other than the use of the term "common notions," between Descartes' writings and the logic described in Benson Mates, Stoic Logic (Berkeley and Los Angeles: University of California Press, 1953). This suggests that Descartes did not read, at least not with any sympathy, the Greek sources that Mates cites.

Descartes would have been familiar with Seneca and Zeno, whom he discusses in his correspondence with Elisabeth, July 21 to Aug. 18, 1645.

Laporte suggests that he might be reproducing Epictetus or Seneca when he urges us to limit our desires to "those things which depend on us," in the Discourse. Laporte continues, "As for the 'things which do not depend on us,' the counsel of the Stoics in regard to them, as we know, is to remove them from our desires: ἀνεχοῦ καὶ ἀπεχοῦ, and this is approximately the counsel of Descartes." (The Stoic advice might be roughly translated: "Tune in, drop out.") Laporte, Rationalisme, p. 439.

The expression "common notions" plays a very prominent role in the work of Herbert of Cherbury, a contemporary of Descartes. Cherbury's major work, De Veritate, was published in Paris in 1624, before most of Descartes' work was written. Descartes says that he read the work in Latin, about 1638, and he seems to have leafed through the first half-dozen pages of a French translation, probably by Mersenne, in 1639.⁴

⁴"I have not yet received the book De veritate; but I read it in Latin, more than a year ago, and I wrote what I thought about it then to M. Eding, who had sent it to me." To Mersenne, June 19, 1639, AT, II, p. 566. The letter to Eding may be that of Aug., 1638?, AT, II, pp. 345-48, but it is more likely that this letter has been lost. Cf. AT, II, pp. 647-49; OP, II, p. 80.

Two Latin editions were published: Paris, 1624, and London, 1633, these were followed by a French edition, n. p., 1639. There is an English translation: Edward Herbert, Baron of Cherbury, De veritate, Meyrick H. Carré, tr. (Bristol: Arrowsmith, 1937).

Descartes' remarks, in his letter to Mersenne of Oct. 16, 1639, clearly refer to passages in the first few pages (pp. 75, 77, 78-79, and 81 of the English version).

Descartes did not borrow the term "common notions" from Cherbury, because he uses it in his own Rules, some ten years before he read De veritate. Rules, XI, AT, X, p. 419.

A more likely source of the term would be Cherbury's own source, the writings of Cicero. See Carré's introduction to De veritate, p. 42. The quotations that Carré gives, however make it clear that Cicero's common notions are quite unlike Descartes': "Omnium consensus est naturae vox" and "Nulla gens tem fera, nemo omnium tam sit immani cujus mentem non imbuerit Deorum opinio." Tusc. Disp. 1. 13, 30, 35.

On the other hand, because nearly all of Descartes' references to "common notions" appear after his reading of De veritate, we may assume that Descartes' use of the term could have been affected by that of Cherbury. But: "I have certainly noticed that M. Herbert takes many things for common notions which are not; and it is certain that one ought to receive as a notion only what cannot be denied by anyone." To Mersenne, Dec. 25, 1639, AT, II, p. 629.

As Descartes makes clear in his letter to Mersenne, he understands "common notions" very differently from Cherbury. He is quite unwilling to accept universal consent as a rule of truth. Although the natural light is available to all men, only a few know how to use it correctly. Thus the common notions are "common" only in the sense that they are available to all persons. Cherbury, on the other hand, believes that consent is actually universal, at least among rational and civilized adult persons.⁵

Nevertheless, Descartes does agree with Cherbury that there must be some source of knowledge which is independent of experience, and that the content of this knowledge is available to all. In this, they both appear to be quite different from the classical Greek Stoics, who saw the common notions as "an idea-forming hexis" which works upon the presentations of the senses, which are built up from individual presentations into general images.⁶

What are the "common notions" for Descartes?

I want to show that what Descartes calls "common notions" are the simple connectives between simple ideas or concepts, which can function as undoubted and undoubtable principles in his metaphysics. Connecting ideas together,

⁵Cf. Discourse, II, AT, VI, p. 16.

⁶Cf. Watson, Stoic Theory of Knowledge, p. 24.

they are somewhat like the axioms in a system of formal logic.

Descartes rejected the Scholastic logic, based upon the syllogism, as sterile, useful at best as a rhetorical device, but incapable of adding to our knowledge.⁷ Against this futile system, he proposed another form of logic, based upon the very successful results that he had obtained in algebra and geometry. Beginning with simple ideas, which were intuitively clear, this method proceeded on a step-by-step basis, in which each step was "seen" or "intuited" to follow from those which preceded it. This immediate intuition of the necessity of each step was, ultimately, the source by which it was validated.

Nevertheless, certain generalizations could be advanced concerning these steps. They were no substitute for the immediate intuitions. Descartes did not want to fall into the error of the Scholastics, who established sophistries by appealing to plausible-sounding rules:

. . . I was alert to the fact that, as for logic, its syllogisms and the majority of its other instructions serve rather to explain to another person the things that one already knows, or even, like the art of Lull, to speak, without judgment, about the things that one does not know, rather than for learning anything.⁸

⁷Rules, X, AT, X, pp. 405-406; Rules, XIV, AT, X, p. 440, Principles, Preface, AT, IX2, pp. 13-14; Search, AT, X, p. 521, cf. OP, II, p. 1027.

⁸Discourse, II, AT, VI, p. 17. In describing the logic of Descartes, Alquié notes that in order for the conclusion to be true, actually, it is not enough that the

There is never a complete list of the common notions. Descartes is not like either the traditional logician or the modern logician who gives a complete list of valid forms and a mechanical method for determining the acceptability of an inference or formula.

Descartes explains the expression "common notions" in the twelfth Rule. In relation to our intellect, he tells us, certain things are "simple." These are of four

reasoning to be formally correct. It is also necessary that the premisses be materially true. OP, I. p. 130. It is curious to see the rejection of Lull coupled with the rejection of the syllogism. Lull himself had turned from the Scholastic logic to what he called a material logic. By forming combinations of selected terms, the Lullian could exhibit possible propositions and determine their material truth for himself. Cf. Armand Llinares, Raymond Lulle: philosophe de l'action (Paris: Presses Universitaires de France, 1963), p. 220. Descartes' rejection of the formal logic of the Schools, like Lull's, seems to have been motivated by the apparent fact that it was less than helpful in reasoning. If an argument fitted the formal pattern and was valid, its validity could be seen intuitively. If it was not intuitively clear, however, adherence to the formal rules would not guarantee that it was valid. Cf. Laporte, Rationalisme, pp. 22-23.

This is one point at which Descartes agrees with the Stoic logicians: "One should observe that there is a dialectical theorem handed down for the analysis of syllogisms, namely, 'Whenever we have premisses which yield a conclusion, we have in effect also this conclusion among the premisses, even if it is not explicitly stated.'" Sextus Empiricus Adv. Math. VIII, 223, quoted by Mates, Stoic Logic, p. 102.

One of the Stoic examples of logical fallacy that Mates reproduces may help to clarify Descartes' position: Whatever you say goes through your mouth. You say wagon. Therefore a wagon goes through your mouth. An argument like this is clearly fallacious, even though it seems to fit the traditional forms. A person who applied the traditional forms for the syllogism would be more likely to be taken in by this fallacy than the person who had no training at all in logic, and who simply relied on his native intuition.

kinds. The first kind is purely intellectual, and includes thinking, doubt, ignorance, volition, and so on. The second kind is purely material and includes figure, extension, motion, and so on. The third kind includes those things which can be either mental or material, such as existence, unity, duration, and so on. Finally, the "common notions" are

like certain chains joining other simple natures together, and on the basis of which rests whatever we conclude by reasoning, as for example: that those things which are equal to a third thing are equal to each other, or that things which cannot be related to the same third thing have some difference between them, and so forth.⁹

The common notions, then, are simple entities which serve to link other simple entities together. They seem to correspond to the axioms in a logical system, since "whatever we conclude by reasoning" is based upon them. And, as Descartes soon points out,

. . . these simple natures are all self-evident, and never contain any falsity. This is easily demonstrated if we distinguish that faculty of the intellect by means of which it intuitively and recognizes objects from that by which it judges by affirming or denying, for it could happen that we think we are ignorant of those things which we really know, as when we suspect that they contain something unknown to us beyond that which we intuit, or which we learn by thought, and when this suspicion of ours is false. For this reason it is evident that we err if we think that the whole of one of these simple natures is not known to us, for if we can conceive it in the very slightest degree, which is certainly necessary since we are supposed to have made some judgment about it, it must, for this very reason, be concluded that we know it all, for

⁹Rules, XII, AT, X, pp. 419-20.



otherwise it could not be said to be simple, but composed of that which we perceive in it and of that which we judge we do not know.¹⁰

It is important to see that the common notions are among the simple entities which are intuited and recognized by the intellect, and which are known perfectly if they are known at all. We thus do not seem to have the freedom to deny them. We simply recognize the common notions.

Writing to Mersenne in 1638, Descartes describes the method by which we may come to recognize a common notion:

I do not know any other method for judging the notions which can be taken for principles, if not that it is necessary to prepare the mind, in getting rid of all the opinions with which one is preoccupied, and rejecting as doubtful all that can be doubtful. It is certainly a common notion to think that, if an intelligent nature is independent, it is God . . .¹¹

This passage is important in seeing how Descartes avoids circularity in determining the criterion of truth. When we have rejected all doubtful opinions, our mind is prepared to recognize the common notions.

There is a passage in the Meditations which appears to correspond to the passage in the Rules which characterizes the common notions. The analysis, however, is somewhat different:

¹⁰Rules, XII, AT, X, pp. 420-21. Cf. the very similar analysis of Aristotle's De anima: "The thinking then of the simple objects of thought is found in those cases where falsehood is impossible: where the alternative of true or false applies, there we always find a putting together of objects of thought in a quasi-unity." Aristotle De anima III. 6. 430a26-28. (McKeon, ed.)

¹¹To Mersenne, Nov. 15, 1638, AT, II, p. 475.

. . . I must define precisely what I properly understand when I say that nature teaches me something. For I take nature here in a more restricted signification than when I call it an assemblage or a complex of all the things which God has given me. Inasmuch as that assemblage or complex includes many things which belong to the mind alone, of which I do not intend to speak here; as, for example, my notion of the truth that what has once been done cannot be undone, and an infinite number of others similar to this, which I recognize by the natural light, without the aid of the body; and inasmuch as that assemblage includes many others also which belong only to the body alone, and are not here included under the name of nature, like the quality that a thing has to be heavy, and many others which are similar, of which I do not speak either, but only those things which God has given me, as a being which is composed of mind and body.¹²

Here the common notion, "What has been done cannot be undone," is assigned "to the mind alone." The meaning here is puzzling, because the object of that notion, "what has been done," sure is not limited to mental events. As the next phrase indicates, Descartes seems to want to say that we recognize the truth of this notion "without the aid of the body," by means of the natural light.

According to the earlier scheme of the Rules, we recognize the truth of common notions immediately, by the vis cognoscens or natural light alone, without judgment, and thus without the aid of the will. Now, according to the new analysis of the Meditations, the common notions are recognized by the mind alone. We thus have the natural light as a faculty or power of the pure understanding, one function of which is to recognize certain common notions.

¹²Meditations, VI, AT, IX, p. 65.

Neither the will nor the other faculties--sensation, imagination, memory--enter in, and thus there is no possibility of error due to the interference of body.

A proof, in the style of geometric proofs, of the existence of God is appended to the second set of Objections and Replies. Here, the "Axioms, or Common Notions" are ten postulates which are used in subsequent proofs of the existence of God and the distinction between mind and body. The common notions listed here include the causal principles, together with postulates concerning time, the will, and the nature of ideas or concepts.¹³

In the letter to Clerselier which replies to criticisms of Gassendi and forms part of the French edition of the Objections and Replies, Descartes produces still another reason for exempting the common notions from hyperbolic doubt. They are not prejudices. The will has never had the opportunity to pronounce upon them, because they have been immediately recognized as true:

. . . the word prejudice does not extend to all the notions which are in our mind, and I admit that it is impossible to discard all of them, but only to all the opinions which the judgments that we have previously made have left in our belief; and, because it is an action of the will to judge or not to judge, as I have explained in its proper place, it is evident that it is in our power; for finally, to rid oneself of all sorts of prejudices, no other thing is necessary but to resolve to affirm or deny nothing of all that one has affirmed or denied previously, except after having examined it anew, so that one will not retain by that all the same notions in one's memory. . . .

¹³Objections and Replies, II, AT, IX, pp. 127-28.

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 . . . when I say, "I think, therefore I am," the author of the Instances [Gassendi] believes that I suppose this major: "He who thinks is," and thus that I have already espoused a prejudice. In this he is misusing again the word "prejudice": for, even though one can give that name to the proposition when one considers it without attention, and when one believes that it is true simply because one remembers having judged in this way before, one cannot say then that it is a prejudice when one examines it, because it appears so evident to the understanding that he cannot be prevented from believing it, even though that is perhaps the first time in his life that he thinks about it, and so as a consequence he has no prejudice about it.¹⁴

There are some notions, then, which are so evident that we recognize their truth at once.

It seems to me that the most important of the common notions are those which play a role in the proofs of the third Meditation, and which I have called the "causal principles." For the purposes of exposition, it is convenient to refer to all these principles as different ways of expressing a single common notion, "Nothing comes from nothing." In this simple form, it appears in many of the classic philosophers.¹⁵

¹⁴Objections and Replies, V, AT, IX, pp. 203-04.

¹⁵Aristotle's discussion and use of this principle are very similar to those of Descartes: "The theory of Anaxagoras that the principles are infinite in multitude was probably due to his acceptance of the common opinion of the physicists that nothing comes into being from not-being." Aristotle Physics i. 4. 187a28-29 (McKeon, ed.).

Descartes regularly uses nullus for "nothing" when he is writing in Latin. In French, however, he uses néant, which derives from nec entem, and would perhaps suggest "non-being." This would bring it close to

In Descartes' usage, the clearest expression of this simple form is in the claim that an effect cannot have more perfection than its cause. "For if we suppose that something is found in the idea which is not in the cause, it is then necessary that it takes it from nothing." But nothing can come from nothing, and therefore if something is in the effect it must necessarily be in the cause.¹⁶

A second causal principle is the axiom that error cannot come from a perfect being. If nothing comes from nothing, then error must come from nothing, since error results from our judging when there is a lack or gap in our knowledge. Of his ideas, Descartes says, "if they are false, that is, if they represent things which are not,

Aristotle's term at the end of the passage just quoted, $\mu\eta\ \acute{\omicron}\nu\tau\omicron\varsigma$.

If he is to use the causal principle in the proof of the existence of God, Descartes must not only claim that "nothing comes from nothing" (or perhaps that "no being comes from non-being") but he must also show that ideas are beings, or things to which the causal principle can legitimately be applied. If they are considered only as modes, states, or properties of the mind, it is not at all clear that they are subject to the causal principle. Descartes therefore must assert that ideas have a dual existence: (1) they are modes of the mind-substance, and (2) they can be considered as existences themselves, which must have causes to which the causal principle can be applied.

Descartes' own discussion of this problem, which appears to be a very serious one, is contained in Meditations, Preface; Meditations, Summary, AT, IX, p. 11; Meditations, III, AT, IX, p. 29; Replies, I, AT, IX, pp. 81-82; Replies, III, 5, AT, IX, p. 141.

¹⁶Meditations, III, AT, IX, p. 33.

the natural light makes me recognize that they proceed from nothing."¹⁷

Finally, even the common notion which underlies the cogito may be regarded as a form of "Nothing comes from nothing." For if thoughts are modes, they must be modes of some substance. And if the thoughts actually exist, then they cannot come from nothing: ". . . it is manifest, by a light which is naturally in our souls, that nothingness has no qualities nor properties which are attributed to it, and that when we perceive some [thoughts] there must be found a thing or substance upon which they depend."¹⁸ If the cogito can be said to depend upon this

¹⁷Meditations, III, AT, IX, p. 35; cf. Discourse, IV, AT, VI, pp. 38-39.

¹⁸Principles, I, 11, AT, IX2, p. 29.

Note that one example of what it means to say that one thing has "more reality" than another is when we say that a substance has more reality than its modes. Replies, III, 9, AT, IX, p. 144. This example serves to link the third form of the causal principle to the first form, which said that something with more reality could not come from something with less reality.

This is not to say, however, that Descartes has proved that ideas are modes. I do not find that he has even raised this question. On the contrary, what seems to have caused trouble for his contemporaries was his treatment of ideas as realities which require causes. Objections, I, AT, IX, p. 74. Cf. Robert McRae, "Idea' as a philosophical term in the seventeenth century," Journal of the History of Ideas, XXVI (1965), p. 175.

The form of the argument seems to be: Given that ideas are modes or properties, then there must be some substance in which they inhere. In this form, the argument seems no more than a tautology, since "being a mode" would have, as part of its definition, "inhering in a substance."

reasoning, then it seems to be based upon the same common notion as the causal principles.

This similarity among some of the crucial common notions seems to have been a characteristic of Descartes' way of thinking, which has proved particularly annoying to some modern philosophers, Bergson in particular. Descartes simply could not conceive that objects might pop into existence out of nowhere, or that unconnected thoughts might exist without a mind to think them.¹⁹

We turn now to the Principles, where there is still another analysis of the objects of our understanding, again called "simple," as in the Rules, but differently assigned to mind and body. According to the Principles, there are two broad classes of things about which we have some notion. ". . . the first contains all the things which have some existence, and the other all the truths [or truisms] which are nothing outside of our thought."²⁰

¹⁹Henri Bergson, Creative Evolution (New York: Modern Library, 1944), pp. 375-76.

²⁰Principles, I, 48, AT, IX2, p. 45 (French version). Descartes has made what appears to be an error in the earlier Latin version of the Principles, which is corrected in the French version. In that earlier version, he has referred to the common notions as "eternal truths," which, as we will see, was Mersenne's term, which Descartes adopted, as one of his idiosyncratic technical terms, for the universal propositions of mathematics and physics. In the French version, the word "eternal" has been suppressed. (The Haldane-Ross translation incorrectly inserts "eternal" into the line at the bottom of HR, I, p. 238.) In the Interview with Burman, Descartes states, when questioned about this passage, that by "eternal truths"



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Among the things which exist, according to this section of the Principles, are (1) those which pertain to the mind, (2) those which pertain to the body, and (3) those which pertain to the union of mind and body, such as passions, emotions, and sensations.²¹

The common notions, which do not exist outside the mind, form the other class of objects of recognition:

Up to this point, I have enumerated all of what we recognize as things; it remains to speak of what we recognize as truths [or truisms]. For example, when we think that something cannot be made from nothing, we do not believe that this proposition is a thing which exists, or is the property of something, but we take it for a certain eternal truth which has its seat in our thought, and which is called a common notion or a maxim: in the same way, when it is said that it is impossible that the same thing is, and is not, at the same time, that that which has been done cannot be undone, that whoever thinks cannot fail to be or to exist as long as he thinks, and many other similar things, these are only truths [or truisms], and there is such a great number like this that it would be difficult to enumerate them; but, as a matter of fact, that is not necessary, because we could not fail to recognize them when the occasion presented itself to think of them, and if we did not have prejudices which blinded us.²²

Some of our thoughts refer to objects which are different from our present thoughts. These include mental

he here understands "those which are called common notions, for example, 'It is impossible that the same thing be and not be.'" Burman, AT, V, p. 167. "Eternal truth" is never used elsewhere in this sense, although presumably Descartes regards the common notions as eternally true.

²¹Descartes had come at this point to regard the union of mind and body almost as a distinct substance. Cf. Laporte, Rationalisme, Livre II, ch. 3, pp. 220-54.

²²Principles, I, 49, AT, IX2, p. 46.

objects, bodily objects, and objects in which mind and body interact. Another class of objects have to do with relations between our thoughts themselves. As long as we are stating simple relationships between simple concepts, which are presently before the mind, then there is nothing which can be falsified.²³

I think that what Descartes means here is something like this. As long as we talk merely about what we mean by "thing," "being," and the other concepts involved, we can say that "A thing cannot both be, and not be, at the same time." Again, if we talk merely about the concepts "done" and "undone," we can say, "What has been done cannot be undone." The common notions are irrefutable, since their truth depends only on the concepts which they relate, not on external objects. This, I think, is Descartes' way of answering the sceptic. We can know some things, and we can know them with certainty. We can state the simple, intuitively recognized relationships among simple conceptions which are presently before the mind, and these

²³Asked if there can be an idea of nothing [nihil], Descartes replies: "That idea is only negative, and can hardly be called an idea. But here [in the third Meditation], the author takes 'idea' in the proper and strict sense. There are also ideas of common notions which are not ideas of things, properly speaking; but then 'idea' is taken in a larger sense." Burman, AT, V, p. 153. Common notions, then, are ideas (in some extended sense), but they are not ideas of things. If there are no "things" to which they must conform, then the conformity-relationship cannot be falsified. This, at least, seems to be Descartes' implied analysis.

cannot be falsified or doubted in any way. There is an indefinite number of common notions, but we "cannot fail to recognize them" whenever we think of them, and when we have cleared away the prejudices which might obscure the natural light.

But this, unfortunately, is not enough to provide an adequate ground for the causal principles. Although the common notions may only state relations among concepts, those concepts themselves do refer to external objects--that is, objects which exist outside my present thoughts. When I say that an effect cannot be greater than its cause, I am referring to effects and causes, not merely to thoughts about effects and causes. It may be impossible for me to conceive of an event without a cause, but this does not make it inconceivable that an evil genius has tricked me into believing a falsehood. Perhaps some events don't have causes. And similarly for the other common notions. Although it may be impossible for anyone, even the sceptic, to avoid believing them, it does not therefore follow that an evil genius might not have destroyed our ability to recognize the truth.

I do not believe, then, that Descartes has any real reply to a sceptic who is willing to question the causal principles. His only way of answering is to say that he, Descartes, finds it impossible to doubt the common notions. And if this foundation is all that he can

provide, then it seems appropriate to classify Descartes among the dogmatists.

CHAPTER VII

THE CARTESIAN CIRCLE

One of the most frequent criticisms of the Cartesian system has been the claim that it contains an argument which is viciously circular. It would be surprising if Descartes actually does argue in a circle, because he is fully aware of the dangers of such a fallacy, and he discusses it often.¹

Does Descartes actually argue in a circle? To answer this question, let me try first to characterize a "vicious circle." A philosophical argument would be circular if each step of the argument is derived from other steps of the same argument. We would say that an argument is viciously circular if some of the steps which are required for the conclusion are said to be warranted only by the conclusion of this same argument. If we call such an argument "vicious," it is because it appears to prove something when it really does not. At best, it can show only that certain propositions can be derived from certain

¹Objections and Replies, V, Letter to Clerselier, AT, IX, p. 213; Replies, V, 5, 2, AT, VII, p. 383; Meditations, Intro., AT, IX, pp. 4-5; Letter to Morin, July 13, 1638, AT, II, pp. 197-98.

other propositions. It cannot show that any of them are true. Like a castle built in the air, it may all hang together, but it doesn't rest anywhere.

Descartes is able to reply to possible criticism of his physical theories by pointing out that they do rest somewhere:

If some of the things about which I have spoken, at the beginning of the Optics and the Meteorology are shocking at first, because I call them suppositions, and because I do not seem to want to prove them, you should have the patience to read the whole with attention, and I hope that you will be satisfied with it. For it seems to me that the reasons given there follow from one another in such a way that, as the last are demonstrated by the first, which are their causes, these first are demonstrated by the last, which are their effects. And it ought not to be imagined that I am committing here the fault which the logicians call a circle; for since experiment [expérience] renders most of these effects very certain, the causes from which I deduce them do not serve so much to prove them as to explicate them; but, conversely, it is the causes which are proved by the effects.²

In a similar way, Descartes replies to criticisms of Morin:

You also say that "to prove the effects by a cause, then to prove that cause by the same effects, is a logical circle," which I admit; but I do not admit that it would be a circle to explain the effects by a cause, then to prove the cause by the effects: for there is a great difference between proving and explaining. In addition, I say that one can use the word "demonstrate" to signify both the one and the other, at least if it is taken according to the common usage, and not in the particular signification which the philosophers have given it. I also add that it is not a circle to prove a cause by many effects which are

²Discourse, VI, AT, VI, p. 76.

known from elsewhere, then, reciprocally, to prove several other effects by that cause.³

We may wish to question whether, in fact, the cause can be proved by the effects, or whether it is simply confirmed or rendered more probable by them. But this is not the point at issue here. The point is that Descartes is quite willing to admit the internal circularity, in the sense of interdependence, in his physics. But this is not, he claims, a fault. Some of the members of the set of assertions that constitute the physics (e.g., the precise angles at which various colors are observed in the rainbow) are known independently, by experiment. Thus their truth is not dependent wholly upon their derivation within the system.

It is not against the physics, however, but against the metaphysics, that the charge of circularity has been most frequently made.⁴ The charge is clearly stated by Arnauld, in the fourth set of Objections:

³To Morin, July 13, 1638, AT, II, pp. 197-98.

⁴There is also the possibility of circularity within the ethics, insofar as Descartes advances what might be called an ethical system. Roughly, such a charge would be that Descartes argues as follows: God has created the ethical laws. The ethical laws are good because God, who is good, has created them. But we know that God is good because we judge him by the ethical laws. Such a charge against Descartes, together with his reply to it, would, I think, parallel the criticism of the metaphysics, and the reply.

I have only one further scruple, which is to know how he can defend himself against committing a circle, since he says that "we are not assured that the things which we conceive clearly and distinctly are true, except because God is, or exists."

For we cannot be assured that God is, except because we conceive that very clearly and very distinctly; therefore, being assured of the existence of God, we ought to be assured that all the things which we conceive clearly and distinctly are all true.⁵

To this, Descartes replies:

. . . I have already shown quite clearly in the replies to the second Objections, numbers 3 and 4, that I did not fall into the fault which is called a circle, when I said that we are assured that the things which we conceive quite clearly and quite distinctly are all true, only because God is or exists, and that we are assured that God is or exists only because we conceive that quite clearly and quite distinctly: in making a distinction between the things which we presently conceive quite clearly, and those which we remember having conceived quite clearly in the past.

For, first, we are assured that God exists, because we give our attention to the reasons which prove his existence to us; but after that, it is enough that we remember having conceived a thing clearly, in order to be assured that it is true: that would not be enough, if we did not know that God exists and that he cannot be a deceiver.⁶

In the earlier replies, to which he refers here, Descartes has said:

⁵Objections, IV, AT, IX, p. 167. I don't think that Arnauld is really being fair to Descartes' argument here. As he represents it, Descartes' says something like: "All clear and distinct conceptions are true. I clearly and distinctly conceive that God exists. Therefore, God exists and is not a deceiver. Therefore, all clear and distinct conceptions are true." This omits a step which is essential to Descartes' argument, which is actually quite different from this. The omitted step in Arnauld's statement of it is that which invokes the principle that my idea of God cannot be more perfect than its cause.

⁶Replies, IV, AT, IX, pp. 189-90.

. . . when I said "that we cannot know anything certainly, if we do not first recognize that God exists," I said, in express terms, that I spoke only of the knowledge of those conclusions "of which the memory can return to our minds, when we do not think any more about the reasons from which they have been derived." For the recognition of first principles or axioms is not ordinarily called "knowledge" [science] by the dialecticians. But when we perceive that we are things which think, it is a first notion which is not drawn from any syllogism; and when someone says: "I think, therefore I am, or I exist," he does not conclude his existence from his thought as by the force of some syllogism, but as a thing which is known of itself; he sees it by a simple inspection of the mind. As it appears from the fact that, if he deduces it from the syllogism, he would have to have previously recognized this major: "All that which thinks, is or exists." But, on the contrary, it is taught to him by the fact that he senses in himself that it could not happen that he thinks, if he did not exist. For it is the property of our mind to form general propositions from the recognition of particulars.

. . . in our very clear and very exact judgments, which, if they were false, could not be corrected by any others which are clearer, nor by the aid of any other natural faculty, I maintain confidently that we cannot be deceived. For, since God is the sovereign being, it is necessarily true that he is also the sovereign good and the sovereign truth, and thus it is contradictory to say that something comes from him which tends positively to falsehood. But since there can be nothing in us which is real which has not been given by him, as was demonstrated in proving his existence, and since we have in us a real faculty for recognizing the true and distinguishing it from the false (as can be proved from the sole fact that we have ideas in us of the true and of the false), if that faculty did not tend to the true, at least as long as we use it properly (that is, when we give our consent only to the things which we conceive clearly and distinctly, for no one can pretend that there is another proper use of that faculty), it would not be without reason that God, who has given it to us, would be taken for a deceiver.⁷

⁷Replies, II, AT, IX, pp. 110-11, 113.

Descartes' reply to Arnauld is not complete in itself, but, taken together with these earlier replies to Mersenne, it constitutes Descartes' answer to the charge of circularity in the Meditations.

First, to Arnauld, he points out that there is no room for doubt in the proof of God, because we "give our attention" to the proof. This would be the act of recognition or intuition, which Descartes has never doubted. Given this proof, we are able to rely upon our memory of previous clear and distinct conceptions.

This is not the whole of Descartes' reply, but it is an important part of it. In his earlier writings, he was greatly concerned with the problem of memory. As Rossi has pointed out, the Rules and even the Discourse are full of notational devices and other means of assuring the validity of long proofs, in which earlier steps might be remembered incorrectly.⁸ The problem, roughly, was this. Given that today I prove a certain geometrical theorem. What right have I, tomorrow, to use this same theorem in proving some further proposition? Since I know that my memory is fallible, I have no right to assume the same degree of certainty in my conclusions, as I would if I did not have to rely upon memory. As we have seen, d'Ailly

⁸Rossi, "Memoria artificiale," pp. 56-61. Cf. Rules, XVI, AT, X, pp. 454-56; Rules, XII, AT, X, p. 417, to Regius, May 24, 1640, AT, III, p. 64.

and the Ockhamists proposed a series of descending levels of certainty, as the proofs grew longer and longer. Descartes refused to accept this scheme, which would render mathematics itself uncertain. For the purpose of reducing the reliance upon memory to a minimum, Descartes developed an abbreviated notation for use in mathematical proofs.⁹

Although memory may be fallible, the proof of the existence of God does not depend on memory, but upon an immediate recognition. God's existence can, therefore, be used to justify our reliance upon memory in other proofs.

In the next passage, from the second set of Replies, Descartes points out that it is possible to doubt only those conclusions "of which the memory can return to our minds, when we do not think any more about the reasons from which they have been derived."¹⁰ If we think about the conclusion of an argument, without thinking about the proof from which it is derived, we can indeed doubt its truth. But the common notions are those which are so evident in themselves that we cannot doubt them. They do

⁹Rules, XVI, AT, X, pp. 454-66; Discourse, II, AT, VI, pp. 17, 20; Rules, XII, AT, X, p. 417. For Descartes' discussions of the nature of memory, see Meditations, V, AT, IX, pp. 55-56; letter to ***, Aug., 1641, AT, III, pp. 433-34, to Regius, May 24, 1640, AT, III, p. 64; Rules, VII, AT, X, p. 417. For d'Ailly, see Appendix II.

¹⁰Alquié, commenting on this passage, emphasizes the "can return." It is not the validity of memory which is at stake in this passage, but the possibility of doubting conclusions which are not immediately evident in themselves. Alquié, OP, II, pp. 563-64.

not depend upon other reasons. Descartes even says that they are not "science," perhaps because a science will presuppose the recognition of these first principles. The cogito is not derived from a train of reasoning but is recognized immediately.

Finally, Descartes maintains that we cannot be deceived in our immediate recognitions of truth and falsehood. I find in this passage the same trouble that I found in Principles, I, 30: that the argument will not stand against a sceptic who wishes to maintain that our immediate recognitions can be false, and that we are not justified in trusting to the natural light. But there is no doubt that Descartes wants to maintain here that there is a type of knowledge which is not subject to doubt. Such knowledge, or recognition, revealed by the natural light, consists of the common notions, which are taken as the axioms of the system. Because these axioms are not subject to doubt, Descartes claims, they need not be proved, and they therefore permit the Cartesian system to avoid a vicious circularity.

Descartes does point out that the reliability of the natural light, which permits us to recognize the first principles, is a logical consequence of the proof of the non-deceptive character of God. If it were not reliable, we would not be able to tell truth from falsehood. But we can tell truth from falsehood, and the explanation of our ability to do so is simply that God is not a deceiver.

Although we have explained this ability, the axioms do not depend upon this explanation, and the system is therefore not viciously circular.

A number of recent commentators have discussed the accusation that Descartes nevertheless failed to see what appears to certain critics to be an obvious and serious error. I want to turn now to several of these recent studies.

Alan Gewirtz, in "The Cartesian Circle," attempts to show that there are "certain fundamental factors" in Descartes' philosophy which remove the circularity and contradiction which the critics have found in it. "These factors consist ultimately in two closely related distinctions: (1) between the methodological and metaphysical moments of Descartes' doctrine of knowledge, and (2) between the analytic and synthetic methods of demonstration."¹¹ By carefully distinguishing these "moments" and methods, Gewirtz maintains, Descartes has avoided a viciously circular argument. The doubt and the certainty of the methodological level are confused, by Descartes' critics, with the doubt and the certainty of the metaphysical level.

Gewirtz' exposition requires, in addition, the distinction between two meanings of "idea":

¹¹Alan Gewirtz, "The Cartesian circle," Philosophical Review, L (1941), p. 369.

Ideas . . . have a double status: on the one hand, they are themselves existents, "formal essences," modes of thought; on the other hand, they are significances, "objective essences," purporting to be representative of things other than themselves. In order that ideas be susceptible of truth, they must be viewed not in the first way, or "materially," but in the second way, or "informally."¹²

Clearness and distinctness, for the mind which apprehends the ideas, become the logical criteria of coherence or consistency. On the metaphysical level, however, the criterion of truth means conformity between the idea and its object. (After the proof of the existence of God, clearness and distinctness may be used as criteria of truth.) At the psychological level, we may doubt the existence of the objects of our ideas, but we cannot doubt the coherence of those ideas which we clearly and distinctly conceive. This merely psychological certainty, however, is challenged by a metaphysical doubt. "The full scope of the doubt becomes apparent in his doctrine of God's omnipotence, which extends even to the 'eternal truths' and the law of contradiction."¹³ But this doubt is not extended in such a way as to assert that consistent

¹²Ibid., pp. 369-70.

¹³Ibid., p. 373. I am not convinced that Gewirtz can document this his claim that Descartes believes that God can explicitly repeal the law of contradiction. Descartes certainly seems to say the opposite in Meditations, VI, AT, IX, pp. 57, 62; to Regius, June, 1642, AT, III, p. 567; to ***, Mar., 1642, AT, V, p. 544. But Descartes may be inconsistent about this. I want to discuss this question in the chapter on the will.

ideas may really be inconsistent. Doubt extends only to the objects of these ideas, according to Gewirtz.

Many of the allegations of circularity made against Descartes' metaphysics, Gewirtz believes, come from those that assume that Descartes followed what he calls the "synthetic" method, an argument from supposedly self-evident axioms to conclusions which are known with certainty. On the contrary, he followed what he termed the "analytic" method in the metaphysics, as well as in the physical treatises. Such a method requires that the conclusion be known with greater certainty than the premisses from which it is derived. In particular, it proceeds in the Meditations from a merely psychological certainty to certainty which is metaphysical; that is, from belief to knowledge. Thus the central importance of the cogito, which is the step at which we go from mere certainty to metaphysical truth.

We are able to conclude, then, that "Descartes' argument is not circular, for, while it is by the psychological certainty of clear and distinct perceptions that God's existence is proved, what God guarantees is the metaphysical certainty of such perceptions."¹⁴

Thus, by sharply distinguishing the "moments" or levels within Descartes' argument, we avoid the charge of

¹⁴Gewirtz, "The Cartesian Circle," p. 386.

circularity. I think that we may wonder, nevertheless, whether this is what Descartes himself thinks that he is doing. Gewirtz claims, for example, that the natural light itself is subject to doubt:

Now the natural light is the "faculty of recognizing the true and distinguishing it from the false," and its act is the act of intuition, which the metaphysical moment has declared subject to the hyperbolic doubt; later Descartes is to state that the natural light has been given to the mind by God, and that it comes under the divine guarantee, so that its employment to demonstrate God's existence incurs all the wonted charges of the Cartesian circle.¹⁵

While most of Gewirtz' argument is very amply documented, the thread of documentation underlying this passage is thin indeed. I have already discussed the difficulty that we have in linking the natural light with "intuition." The central contention, that the natural light might be deceptive if God were a deceiver, is supported only by a passage in the Principles (I, 30), but by nothing in the Meditations. In this case, we may wonder what it would mean to doubt the truth of the natural light, since, as the third Meditation has told us, the natural light is that which makes me see that a thing is true. "And I do not have any other faculty or power in me to distinguish the true from the false, which could teach me that what the light shows me to be true, is not true, and in which I could have faith, other than it."¹⁶ The natural light,

¹⁵Ibid., p. 387.

¹⁶Meditations, III, AT, IX, p. 30.

as the power to distinguish the true from the false, is indeed given to man by God, as are all his powers. But Descartes does not indicate that the natural light is subject to possible error (except at Principles, I, 30) and never explains what it would mean to recognize that it is false. If psychological certainty is always subject to a metaphysical doubt--if it is possible to doubt the proofs of God's existence and veracity--then we can never be certain of anything. We cannot, without falling into inescapable circularity, base our metaphysical certainty upon our psychological certainty, and then base our psychological certainty upon the metaphysical certainty. Distinguishing these two levels of certainty, then, does not save Descartes from circularity.

Gewirtz has also dealt very sketchily with the role that God plays in guaranteeing, or otherwise upholding, memory. This underemphasis is more than amply compensated for in an article by Willis Doney.¹⁷

Doney finds Descartes' whole answer to the charge of circularity in the distinction between present perceptions and those which are remembered. In responding to the criticisms of Arnauld, "Descartes' reply was to distinguish two senses" of the statement, "What we clearly and distinctly perceive is true."

¹⁷Willis Doney, "The Cartesian circle," Journal of the History of Ideas, XVI (1955), pp. 324-38.

. . . One, it might mean: what in fact he at present clearly and distinctly perceived was true. Or, two, it might mean: what he recalled having clearly and distinctly perceived was true. . . . Present clear and distinct perceptions were never subject to doubt. Anything so perceived did not depend on God as guarantor of its truth.

In the second sense, however, "memory being fallible, God must vindicate its use."¹⁸

Descartes' reply to Arnauld, then, becomes a satisfactory and complete reply to the charge of circularity. "In answering the objection in this way, Descartes reaffirmed what he had stated in considerable detail in the Rules: reason, properly conducted, was infallible; errors in reasoning were to be charged to memory."¹⁹

Doney attempts to show that the Cartesian doubt, as applied to reasoning, was wholly a doubt of the veracity of memory. This requires rather extensive reinterpretation of Descartes' writings. Thus, when Descartes asks, "How do I know that I am not deceived every time that I add two and three, or count the sides of a square, or judge of things yet simpler, if anything simpler can be imagined?" these doubts are taken to be doubts of processes which involve memory, since counting the sides of a square requires time, and thus memory.²⁰

¹⁸Ibid., pp. 325-26.

¹⁹Ibid., p. 362.

²⁰Ibid., p. 330. Cf. Meditations, I, AT, IX, p. 16.

While it is certain that memory is subjected to the hyperbolic doubt of the second Meditation,²¹ it is not clear that memory is involved in the addition of two and three, in a way in which memory is not involved in the proofs of the existence of God. In point of fact, the proofs of God are considerably longer than simple arithmetic processes, and thus more subject to the errors which a faulty memory might introduce.

It also seems to me to be a mistake, when Doney says that "Present clear and distinct perceptions were never subject to doubt." It seems to me that the purpose of the fourth Meditation was to prove that clear and distinct conceptions, or perceptions, are true, and that it was precisely these conceptions which were subject to the hyperbolic doubt of the first Meditation. Such "eternal truths" or clear and distinct conceptions will be our concern in a later section.

Harry G. Frankfurt, in a recent paper, has shown Doney's view to be quite untenable.²² Among the apparent weaknesses in this position, Frankfurt finds: (1) "It commits Descartes to the absurd doctrine that memory is

²¹Meditations, II, AT, IX, p. 19; Meditations, V, AT, IX, p. 55; to *** ("Hyperaspistes"), Aug., 1641, AT, III, p. 434, to Regius, May 24, 1640, AT, III, pp. 64-65.

²²Harry G. Frankfurt, "Memory and the Cartesian circle," Philosophical Review, LXXI (1962), pp. 504-511.

infallible, at least in cases when that memory reports that something was clearly and distinctly perceived. . . . Indeed, it is easy to show that after Descartes has proven God's existence and veracity he still did not take the reports of memory as guaranteed."²³ (2) If the doctrine is weakened to permit errors in memory, then we no longer have an absolute guarantee that clear and distinct perceptions are true, since we must rely on our memory of our proof of God's existence. (3) Finally, ". . . in fact Doney offers no direct evidence in behalf of this interpretation."²⁴

It seems to me that Frankfurt has shown, once and for all, that Descartes was not primarily attempting to validate memory in his proof that God exists and is not a deceiver.²⁵

²³Ibid., pp. 506-07; cf. Principles, I, 44, AT, IX2, pp. 43-44.

²⁴Ibid., p. 509.

²⁵Laporte, in Rationalisme, advances much the same view as Doney: "It is against these fluctuations [of vague and inconstant opinions] that the knowledge of God and of his veracity is going to protect me, in raising past evidence to the level of present evidence. But, to be sure, it would not be able to fill such an office except if it were itself the beneficiary of present evidence." P. 157. The balance of this passage in Laporte is very similar to parallel passages in Doney.

Frankfurt's more positive views are set forth in another recent article. Harry G. Frankfurt, "Descartes' validation of reason," American Philosophical Quarterly, II (1965), pp. 149-56.

The objections which Frankfurt has raised to Doney's claims can, I believe, also be applied to the much

I will not attempt to discuss Frankfurt's argument in detail, since, as Frankfurt points out, it is heavily dependent on Gewirtz' article. It seems to me to be weakened by stating the problem as that of the "validation of reason," since it is not at all clear that the faculty to which Descartes refers as "reason" is identical with what he calls "intuition" or "natural light." Stating the problem in this way makes a faulty solution almost inevitable. Frankfurt attempts to show that Descartes avoids circularity by distinguishing sharply between the certainty and the truth of a statement. Thus I can be certain of the sum of two numbers, but I can still suspect that I am deceived as to the truth. It is difficult, however, to find this distinction consistently observed in Descartes. Finally, Frankfurt has failed to eliminate circularity from Descartes' argument: "Given that reason leads to the conclusion that reason is reliable because a veracious God exists, may it not also lead to the conclusion that

earlier article of Stout's, which Doney includes in his recent anthology of critical essays on Descartes. Stout asks, "What part, then, does the knowledge of God play? It is needed to guarantee the accuracy of my memory, not the principle that what I have clearly and distinctly perceived is true." A. K. Stout, "The basis of knowledge in Descartes," Mind, NS, XXXVIII (1929), pp. 330-42, 458-72. Reprinted (abridged) in Willis Doney, Descartes: a collection of critical essays, (Garden City, N. Y.: Anchor, 1967), pp. 169-91.

there is an omnipotent demon whose existence renders reason unreliable?"²⁶

It is difficult, then, to see that Frankfurt has provided a solution which rescues Descartes' argument, although it may be that no solution is possible.²⁷

The accusation of circularity has not been confined to systems like Descartes', which are said to use "reason to justify reason."²⁸ Indeed, one criticism of empiricist systems has been that they, too, are viciously circular, using an empirical justification of empiricism.²⁹ The problem of the system-builder is rather like that of the dictionary-maker. If someone wants to write a dictionary,

²⁶Harry G. Frankfurt, "Descartes' Validation of Reason," reprinted in Doney, Descartes, p. 224, note 22.

²⁷Two more recent articles may be mentioned, simply to show that the problem is not regarded as settled. John O. Nelson, "In defence of Descartes: squaring a reputed circle," Dialogue, III (1964), pp. 262-272, criticizes Frankfurt but, in the end, adopts a position much like his. George Nakhnikian, "The Cartesian circle revisited," American Philosophical Quarterly, IV (1967), pp. 1-5, argues that Descartes sometimes advances an "aberrant view" which holds that "even the most clearly and distinctly intuited propositions are not really known to be true except by those who know that God exists and that He cannot be a deceiver." By eliminating this aberrant view from Descartes' work, we eliminate the vicious circularity of Descartes' argument. Nakhnikian does not explain why Descartes persists in repeating the aberrant view, if it is not an essential part of his system of thought.

²⁸Nelson, "In defence of Descartes," p. 262.

²⁹Cf. Nelson Goodman, Fact, Fiction and Forecast (Indianapolis: Bobbs-Merrill, 1965), p. 64.

then either he must define every word in terms of other words in the same dictionary, or he must include some undefined words among his definitions. If all the words are defined in terms of other words in the dictionary, then his definitions are eventually all circular. If he assumes some words as undefined, then his readers may accuse him of introducing them without warrant. Similarly, the system-builder must either base every part of his system upon some other part of the same system, or include some parts which are not based wholly on other parts of that system. It is very difficult to imagine how anyone would avoid taking one or the other of these two alternatives. What is puzzling about the work of Descartes is that he seems intent upon taking both alternatives, even though they are clearly incompatible. That is, it appears to nearly all commentators that there is some class of entities which Descartes wishes to establish as indubitable, or true, without proof--that is, as the basis upon which all proof will rest--and that he also wishes to prove that some very obvious things are true. It is this latter aim that gives his work the appearance of vicious circularity, and the former aim which saves him from it.

Descartes himself is certainly to blame for at least part of this misunderstanding of his work. In the Replies and in the Principles, as we have seen, he speaks as though God might have created man with a natural light which fails to recognize truth and falsehood, even when it

is properly used. But this would mean that truth could be known only to God and the angels, and Descartes refuses to discuss this possibility.³⁰ In the Meditations, and generally throughout Descartes' writings, the natural light cannot be a source of error, because it is the natural light itself which would have to be used to detect such error.

How, then, does Descartes avoid a circular argument?

It does not seem to me that Descartes' reasoning, in the Meditations, is viciously circular. An argument is not circular if there are some steps in it which do not depend on other steps in the same argument. Descartes wishes to provide an argument which will validate the set of all clear and distinct conceptions, including the theorems of mathematics and physics, for which the metaphysics provides a foundation.

The premisses are the set of common notions, which are made manifest to us by the natural light, including the various forms of the causal principle. Let my present thoughts be given. Expressed as propositions, these would be "I am thinking," "I am thinking of a perfect being," "I am doubting," and any other present thoughts.

³⁰Replies, II, AT, IX, pp. 113-14.

With this interpretation, we can construct an argument which is not circular. For example, given "I am thinking," together with "In order to think I must be," and we have, "I must be, I am, I exist."³¹ Similarly, the first proof of the existence of God depends on axioms or common notions which are revealed by the natural light. Whatever the structural flaws and other difficulties that we may find in this argument, it is hard to see it as a vicious circle.

³¹The "must" in this conclusion is, of course, contingent on my present thoughts being given. I do not have necessary existence, and if all my thoughts ceased to exist, I would cease to exist.

It is important also to notice that it does some injustice to Descartes' method to cast it into a deductive mold like this. We have an immediate, intuitive recognition that "I am, I exist," before we recognize the truth that "In order to think I must exist." Replies, II, AT, IX, p. 110. But Descartes also regards the cogito as a deduction. Meditations, II, AT, IX, p. 26; Principles, I, 10-11; Principles, I, 49; Meditations, II, AT, IX, p. 19; Discourse, IV, AT, VI, p. 33.

CHAPTER VIII

THE ETERNAL TRUTHS

We have, by this time, considered in some detail one type of knowledge which Descartes found to be absolutely certain. This type included what he called the "common notions." The criterion by which they were validated was simply our immediate recognition of them by means of the "natural light."

We turn now to another type of knowledge, which is also regarded as certain, but which has a derivative kind of certainty. We cannot know that it is certain until we know the existence of God. The principles of geometry belong to this class, and Descartes frequently maintains that our knowledge of geometry is less certain than our knowledge of the existence of God.¹ But geometry is certain, Descartes tells us, and we can know that it is certain if we know that God exists and is not a deceiver.

¹Meditations, Synopsis, AT, IX, p. 11; to Mersenne, February 27, 1637, AT, I, pp. 350-51; to Mersenne, Nov. 25, 1630, AT, I, pp. 181-82; Discourse, IV, AT, VI, pp. 36-39; Discourse, V, AT, VI, p. 41.

The person who believes in God has a kind of certainty that the atheist can never achieve.²

The best way of comparing these two levels of certainty is to arrange, in parallel columns, the terms that Descartes uses in connection with each level of certainty, with some examples of the types of knowledge assigned to each of the levels.

Common notions, simple natures, are recognized.

Eternal truths, clear ideas, are judged true by the will. Concepts, in themselves, are neither affirmed nor denied by the understanding.

Examples: cogito, causal principle, laws of thought.

Geometry, arithmetic, laws of physics.

"Equals added to equals are equal." "What has been done cannot be undone." "He who thinks must exist while he thinks."

"There is no mountain without a valley." "Two joined with three are five." "God exists."

Cannot be doubted. To think of them is to affirm them.

Created by God. Subject to hyperbolic doubt. Could be falsified by a deceptive god.

From the time of Le monde through the time of the Objections and Replies, Descartes never confuses these two

²Replies, II, AT, IX, p. 110; Meditations, V, AT, IX, pp. 55-56; Discourse, IV, AT, VI, pp. 38-39; Meditations, I, AT, IX, pp. 16-17.

levels of certainty. The terms and concepts on the left are never confused with those on the right.³

The purpose of this section will be to see how Descartes manages to overcome a hyperbolic doubt that threatens even the eternal truths. In doing so, however, he raises a major problem, that of proving too much. For, once his doubt has been overcome, he must then go on to show how there can be error. If our understanding or reason is essentially reliable, how can it happen that it is not always reliable? This is the problem of error for Descartes.

To understand what Descartes means by an "eternal truth," we should first understand what he means by "truth."

Descartes repeatedly objects to the Scholastic method of definition, which seems to him often to substitute obscure and difficult terms for those that are already clear.⁴ In particular, he finds that elaborate definitions of the meaning of the word "truth" would only obscure the meaning that we all recognize at once:

³Alquié points out that, in the Rules, all truths are at the same level of certainty. Alquié, Descartes, pp. 106-06. By the time of the Discourse, however, the two levels are clearly distinguished. Discourse, IV, AT, VI, pp. 36-39.

⁴Le monde, VII, AT, XI, p. 39; Rules, XII, AT, X, p. 426; Rules, XIII, AT, X, p. 433; Rules, XIV, AT, X, pp. 442-43; Meditations, II, AT, IX, p. 20; to Mersenne, Oct. 16, 1639, AT, II, p. 597.

. . . as for me, I have never wondered about it, because it seems to me that it is a notion which is so transcendently clear, that it is impossible not to be aware of it . . . For, what reason would we have to consent to that which we apprehend, if we did not know that it was true, that is, if we did not recognize the truth? Thus one could certainly explain what the word means [*quid nominis*] to those who do not understand the language, and tell them that this word "truth" [*vérité*], in its proper signification, denotes the conformity of the thought with the object, but that, when one attributes it to things which are outside of thought, it only signifies that these things can serve as objects of true thoughts, either thoughts of ours, or those of God; but no logical definition can be given which helps us to recognize its nature.⁵

"Truth" is here characterized as a relationship between thought and object, a relationship which Descartes calls "conformity," which is not further analyzed. He gives it a secondary meaning, as applied to an object which is not a thought, which will permit him to say that the idea of a chimera or of a unicorn is not true.

Such a characterization of "truth" seems to be presupposed in Descartes' discussion in the third Meditation:

Now, as for that which concerns the ideas, if they are considered only in themselves, and they are not connected to some other thing, they cannot, properly speaking, be false; for whether I imagine a goat or a chimera, it is not less true that I imagine one, than that I imagine the other.

.
 . . . But the principal error, and the one which is most ordinarily encountered, comes when I judge that the ideas which are in me are similar, or conform to, the things which are outside of me; for certainly, if

⁵To Mersenne, Oct. 16, 1639, AT, II, pp. 596-97. Cf. Replies, IV, AT, IX, p. 179.

I consider the ideas only as certain modes or fashions of my thought, without wishing to connect them to some other thing outside, they can hardly give me occasion for erring.⁶

As Descartes points out in the passage which follows, the true idea of the sun resembles the real sun more closely than does the false idea.⁷

Given this characterization of truth, we find it easy to see why the common notions cannot be falsified. If the common notions are no more than the connectives between ideas or concepts, then they have no objects outside the mind to which they conform, or which they resemble. Their objects are simply the concepts themselves, and they cannot fail to conform to themselves. The most striking example is the cogito itself. When I say, "I exist," the object of my thought is the thinking thing itself. Since it is identical with its object, it cannot possibly fail to conform to its object. Thus it cannot possibly be false.

What, then, is an eternal truth? As with so many of his terms, Descartes uses this expression in his own peculiar way. I think that we might have preferred to call them "universal" truths, or perhaps "necessary" truths, because Descartes' use of them more nearly resembles these modalities. They differ from the common notions, in

⁶Meditations, II, AT, IX, p. 29.

⁷Meditations, II, AT, IX, p. 31.

Descartes' scheme, in that they do have objects which are different from themselves. There are objects to which do conform. We can call them universal, I think, because Descartes says that they are true in all possible worlds. We can also call them necessary, because Descartes believes that we cannot conceive their opposite.⁸

Tracing down the sources of some of Descartes' other special terms has sometimes proved difficult and lengthy. There is no such trouble in finding the source of the expression "eternal truth." It appears for the first time in Descartes' writings in a series of letters to Mersenne in 1630, and Descartes suggests that he is borrowing the term from him.

. . . I will not fail to touch, in my Physics, upon many metaphysical questions, and particularly this: That the mathematical truths, which you call eternal, have been established by God and depend on him entirely, as do all the rest of the creatures. Actually, to say that these truths are independent of him, is to speak of God as of a Jupiter or Saturn, and to subject him to Styx and the Fates. Do not fear, I pray you, to affirm and to publish anywhere that it is God who has established these laws in nature, just as a king establishes laws in his kingdom.⁹

In a letter to Mersenne during the next month, Descartes returns to this topic:

⁸Le monde, VII, AT, XI, p. 47; Discourse, V, AT, VI, pp. 41-43, 45; Principles, IV, 206, AT, IX2, p. 324.

⁹To Mersenne, Apr. 15, 1630, AT, I, p. 145. This is not to say, however, that Mersenne invented the term "eternal truth," or that Descartes had never heard it before.

As for the eternal truths, I say again that "they are true or possible solely because God recognizes them as true or possible; but, on the other hand, I do not say that they are recognized by God as true like truths existing independently of him."

And if men understood the sense of the words correctly, they would not be able to say without blasphemy that the truth of something precedes the recognition that God has of it, for in God, to will and to recognize are only one thing; in such a way that "from the fact that he wills something, he recognizes that thing by it, and by it only such a thing is true." No one should therefore say, "if God did not exist, these truths would not be less true"; for the existence of God is the first and the most eternal of the truths which can be, and the only truth from which all the others come.¹⁰

Again, in a letter later that month, Descartes maintains that:

. . . it is certain that he is the author of the essence as well as of the existence of the creatures: that the essence is nothing other than these eternal truths; which I do not conceive as emanating from God as the rays from the sun, but I know that God is author of all things, and that these truths are something, and as a consequence he is the author of them.¹¹

Descartes' position can be characterized as voluntarist, in that he holds that the eternal truths are willed by God. It is a position which he shares, perhaps, with the Ockhamist, Pierre d'Ailly. And it is, incidentally, one of the points at which he disagrees with Suárez, who held with Aquinas, that truth and goodness must not be wholly dependent upon God's will.¹² The doctrine of the

¹⁰To Mersenne, May 6, 1630, AT, I, pp. 149-50. The expressions in quotation marks are in Latin in the original.

¹¹To Mersenne, May 27, 1630, AT, I, p. 152.

¹²Cf. Alquié, OP, I, p. 559, and Descartes, pp. 47-48.

creation of the eternal truths does not appear in Descartes' published writings other than the Objections and Replies. But he discusses it frankly in many of his letters from 1630 onward.¹³

To say, as Descartes does, that God has created the essences of things as well as their existence would appear to mean, in part, that God has established the laws according to which they act. Le monde, which was probably the physical treatise to which Descartes refers in the first of the passages above, was completed or abandoned about 1633, three years after the letters to Mersenne. In the work he frankly avoids the "metaphysical" question that he had proposed to Mersenne, although it is clear that he does not repudiate it:

. . . when they [the particles of matter] began to move, they began also to change and to diversify their movements by their collisions with one another: in such a way that, if God conserves them afterward in the same fashion that he created them, he does not conserve them in the same state: that is, since God always acts in the same way, and as a consequence always produces the same effect in substances, there is found, as if by accident, many diversities in that effect. And it is easy to believe that God, who, as everyone ought to know, is immutable, acts always in

¹³Replies, VI, AT, IX, p. 236; letter to Villebressiue, Summer, 1631, AT, I, p. 212. Cf. Alquié, Descartes, p. 47-48; Alquié, La découverte métaphysique de l'homme chez Descartes (Paris: Presses Universitaires de France, 1950), ch. 5; Jacques Maritain, Le songe de Descartes (Paris: Corrêa, 1932); Emile Bréhier, "The creation of the eternal truths in Descartes' system," Revue Philosophique de la France et de l'Etranger, CXIII (1937), tr. and reprinted in Doney, Descartes, pp. 192-208.

the same fashion. But, without engaging further in these metaphysical considerations, I will put down here two or three of the principal rules, following which it is necessary to believe that God has made Nature act in this new World, and which will suffice, I believe, to make you recognize all the others.¹⁴

Descartes then announces three laws of motion, which he calls "eternal truths." He says that they "follow manifestly from the sole fact that God is immutable, and the fact that, because he always acts in the same way, he always produces the same effect."¹⁵ The creation of the eternal truths involves, then, the creation of the essences of extended things, such that they obey the laws of nature, which are expressed as eternal truths.

But there is also a second act of creation which God performs. He must place within us the ability to recognize that these laws are true:

. . . I will be content to point out to you that, beyond the three laws which I have explained, I do not want to suppose any other laws besides those which follow infallibly from these eternal truths, upon which the mathematicians are accustomed to found their most certain and most evident demonstrations: these truths, I say, following which God himself has taught us that he has disposed everything in number, in weight and in measure; and of which the recognition is so natural to our souls, that we could not fail to judge them infallible, when we conceive them distinctly, nor doubt that, if God had created many worlds, they would be as true in all of them as they are in this world. So that those who will be able to examine the consequences of these truths and of our rules suffi-

¹⁴Le monde, VII, AT, XI, pp. 37-38.

¹⁵Le monde, VII, AT, XI, pp. 38, 41, 43-44, 43. The laws themselves are reproduced in a later chapter of this thesis, "Levels of Certainty."

ciently will be able to recognize the effects by their causes; and, to express myself in the terms of the School, will be able to have a priori demonstrations of everything which can be produced in this new world.¹⁶

Similarly, in the Discourse, Descartes tells us that ". . . I have noticed certain laws, which God has eatablished in nature, and of which he has imprinted notions in our souls, such that after having reflected upon them enough we would not be able to doubt that they are exactly observed in all that is, or is done, in the world."¹⁷

Descartes does not state the doctrine of the creation of the eternal truths any more clearly than this in his published writings, until the fifth set of Replies. In replying to the objections of Gassendi, Descartes remarks:

. . . I do not think that the essence of things, and those mathematical truths which may be known about them are independent of God; yet I think that because God so wished it and brought it to pass, they are immutable and eternal.

.
 . . . you suppose the nature of things to be such that these essences cannot be conformable to it. But, unless you also maintain that the whole of geometry is a fiction, you cannot deny that many truths are demonstrated concerning them, which, being always the same, are rightly styled immutable and eternal. . . . they are, nevertheless, conformable certainly with the real nature of things which has been established by the true God.¹⁸

¹⁶Le monde, VII, AT, XI, p. 47.

¹⁷Discourse, V, AT, VI, p. 41.

¹⁸Replies, V, 5, 1, AT, VII, pp. 380-81.

The eternal truths of mathematics, like the essences, or true and immutable natures, of mathematical objects, are established by God. Their truth consists in their conformity or correspondence with the "real nature of things."

Our concepts are not abstracted, in some empirical fashion, from our sensations of external objects. On the contrary, we recognize the essences of things, when we look at representations of them, in the same way that we recognize a face when we see a caricature drawn on paper:

. . . because we already possess within us the idea of a true triangle, and it can be more easily conceived by our mind than the more complex figure of the triangle drawn on paper, we, therefore, when we see that composite figure, apprehend not it itself, but rather the authentic triangle. This is exactly the same as when we look at a piece of paper on which little strokes have been drawn with ink to represent a man's face; for the idea produced in us in this way is not so much that of the lines of the sketch as of the man.¹⁹

The "power of recognizing" here has a function which we have not previously discussed. In addition to recognizing the common notions and other simple notions, it also recognizes the true and immutable nature of the triangle, when it is reminded of it by the crudely-drawn representation that we see.²⁰ It is important to remember

¹⁹Objections, V, 5, 1, AT, VII, p. 382. Cf. L'homme, AT, XI, p. 179; Rules, XII, AT, X, p. 417.

²⁰The passage concludes: "So certainly we should not be able to recognize the Geometrical triangle by looking at that which is drawn on paper, unless our mind



that innate ideas, for Descartes, are not objects somehow existing within the mind, but rather the habit or ability to recognize certain ideas when they are presented to us. L'homme develops an elaborate mechanical model for this process. Briefly, we might think of it as comparing the mind to a piece of cloth. If the cloth is repeatedly creased along a given line, then, even though we may see no trace of the line in the flattened cloth, it will re-crease much more readily along that line when we attempt to fold it. Similarly, an innate idea is not an object existing somewhere, but the ability of the mind to recognize a true and immutable nature when it is reminded of it.²¹

By establishing a relationship between essence and existence, such that our sensory experience simply reminds us of the essence, and thus of the eternal truths, which are recognized by the vis cognoscens, Descartes lays the groundwork for a theory of error. The sensation is incomplete. It does not conform to its object precisely. The

possessed an idea of it derived from other sources." Replies, V, 5, 1, AT, VII, p. 382. The expression which HR translates as "we should not be able to recognize" is agnoscere non possemus. It seems reasonable to assume that agnoscere would be a function of the vis cognoscens, rather than of the vis intelligendi.

²¹L'homme, AT, XI, p. 178. Cf., for innate ideas, especially letter to *** ("Hyperaspistos"), Aug., 1641, AT, III, pp. 424, 430-31; to Mersenne, Apr. 15, 1630, AT, I, p. 145, to Mersenne, July 22, 1641, AT, III, p. 418; Rules, VI, AT, X, pp. 383-84; Discourse, V, AT, VI, p. 41; Search, AT, X, p. 496.

caricature contains only part of the data that we need to identify the object. Nevertheless, we judge, on the basis of this incomplete data, that the image or concept is that of a triangle, or a round tower, or Maurice Chevalier. But we are mistaken. Gathering additional data, filling in the gaps, we find that the supposed triangle is a rhombus, that the tower is square, that the sketch is Will Rogers. Ultimately, since some data will always be missing from our sensory information, there will always be some room for error in judgments based upon sensation.

If our collection of data is complete, however, we have a "clear and distinct" concept or idea, which can become the basis for an eternal truth. For example, we have a clear and distinct idea of a triangle, and on the basis of a chain of reasoning assert that the sum of the angles of this triangle are equal to two right angles. This conclusion would appear to be an eternal truth. But our clear and distinct conception of it is not enough to guarantee that it is true. In order to be true, there must be a conformity between the idea and its object. This conformity might not hold. No matter how clear and distinct our idea of the triangle, it might happen that the objects themselves, triangles, don't really have their angles equal to two right angles. We need some guarantee that the object will conform to our clear and distinct conception of it.

Descartes states his position most clearly in the sixth set of Replies:

When one attentively considers the immensity of God, one sees that it is manifestly impossible that there is anything which does not depend upon him, not only what subsists, but also one sees that there is no order in it, no law, no reason of goodness and of truth which does not depend upon him; . . . in other words, he would not have been completely free [indifférent] to create the things that he has created. For if some reason or appearance of good had preceded his preordination, it would doubtless have determined him to do that which would have been better. But on the contrary, because he determined himself to do the things which are in the world, for that reason, as it is said in Genesis, "they are very good," that is, that the reason for their goodness depends upon his having wished to do them. And there is no need to ask concerning that goodness, or any of the other truths, mathematical as well as metaphysical, by what kind of cause it depends upon God; for, since the kinds of cause have been established by those who perhaps never thought about that explanation of causality, there would be no place for astonishment, when they would not have given it a name; but nevertheless they have given it one, for it could be called the efficient cause, in the same way that the will of the king can be called the efficient cause of the law, even though the law is not a natural being, but only (as they say in the School) a moral being. It is thus useless to ask how God could have been able to make it so, from all eternity, that two times 4 was not 8, etc., for I say that we are not able to comprehend that, but, since on the other hand I comprehend very well that nothing can exist, in any kind of being that might be, that does not depend upon God, and that it would be very easy for him to order certain things in such a way that men could not comprehend that they could be otherwise than they are, it would be something completely contrary to reason to doubt the things that we comprehend very well, because of some others that we do not comprehend at all, and that we do not see that we ought to comprehend. Therefore it is not to be thought that "the eternal truths depend upon the human understanding, or upon the existence of things," but only on the will of God, who, as a sovereign

legislator, has ordained and established them from all eternity.²²

Since all truth depends upon God's will, it is possible for him to have ordered the world in such a way that we could not comprehend it. In particular, it would have been possible for a God to have ordained that two times four is not eight, even though we do not know how he could do so, or what it would mean to live in such a world.

It is at this point that a hyperbolic doubt can enter. In the seventh set of Replies, Descartes points out, concerning Bourdin, that "We must note too that throughout he treats doubtfulness and certainty not as

²²Replies, VI, 8, AT, IX, pp. 235-36. What is probably Descartes' last word on this subject appears in a letter to Arnauld:

"In any case it seems to me that one ought not to say of any thing that it cannot be done by God; being given that every kind of true and good depends on his omnipotence, I would not ever dare to say that God could not make it so that a mountain is without a valley, or that one and two do not make three; but I say only that he has given me a mind of such a nature that I would not be able to conceive a mountain without a valley or a sum of one and two which would not be three, etc., and that such things imply a contradiction in my conception. I believe that it would be necessary to say the same thing of a space which would be entirely void, of a nothingness which would be extended, of a universe which would be limited, because one would not be able to imagine any limit to the world beyond which I would not be able to conceive extension; and I am not able to conceive a wine jar which was so empty that there was no extension inside it, that there was not, in consequence, any body, since wherever there is extension there also necessarily is body." To Arnauld, July 29, 1648, AT, V, pp. 223-24.

relations of our thought to objects, but as properties of the objects and as inhering in them eternally."²³

Since truth and falsehood are properties of the relationship between a thought and its object, namely, the success or failure of the relationship which Descartes has called "conformity," doubt and certainty must be applied to this relationship. Bourdin had treated it as a property of the objects alone, Descartes maintains.

Finally, in a letter to Father Mesland, with whom Descartes discussed some of the most important of his later metaphysical views, Descartes attempts to clarify the manner in which we might be deceived (if we were not sure of the veracity of God) by a failure of the eternal truths to correspond to existing reality:

As for the difficulty of conceiving how it was free and indifferent for God to have made it untrue that the three angles of a triangle were equal to two right angles, or generally that contradictories could be [or exist] together, one can easily overcome this difficulty by considering that the power of God cannot have any limits; then, also, while considering that our mind is finite, and created of such a nature that it can conceive as possible the things which God really wanted to be possible, but not of such a nature that it could conceive as possible those things which God would have been able to render possible, but which he nevertheless wanted to render impossible. For the first consideration makes us recognize that God could not have been determined to cause it to be true, that the contradictories could not exist together, and that, as a consequence, he could have done the contrary; then the other assures us that, even though that might be true, we ought not to try to

²³Replies, VII, 2, 1, AT, VII, p. 472.

comprehend it, because our nature is not capable of it.²⁴

Descartes here seems to be saying that it is within God's power to create contradictories. As we have noticed, the voluntarist tradition of Pierre d'Ailly said that God could not create contradictories. In the Meditations, Descartes seems to agree with the voluntarist tradition: ". . . I have never judged that it would be impossible for him to do anything, except when I found a contradiction in attempting to conceive it." Like the Ockhamist voluntarists, Descartes had to deal with a number of questions

²⁴To Mesland, May 2, 1644?, AT, IV, p. 118. Note that this could cause serious trouble if we interpret the cogito as a deduction which depends upon the principle of contradiction. Then we would have something like this: Everything which thinks must exist while it thinks. I am thinking. Therefore I exist. But God can create contradictories. Therefore, it is possible that "I exist" and "I do not exist" are both true. Therefore, it is possible that I do not exist.

I think that Descartes attempts to avoid this sort of counter-argument by insisting that the cogito is not a deduction by an immediate intuition: "But when we perceive that we are thinking things, it is a first notion which is not derived from any syllogism; and when someone says: 'I think, therefore I am, or I exist,' he does not conclude his existence from his thought by the force of some syllogism, but as a thing which is recognized of itself; he sees it by a simple inspection of the mind." Replies, II, AT, IX, p. 110. The knowledge of our own existence, which we "see" or intuit, thus precedes our knowledge that God can create contradictories. I think that it might still be argued that this latter knowledge can undermine the former. But it is difficult to say whether such an argument, which attacks the foundations of validity, is or is not valid. If it is valid, then it carries no weight, having destroyed its own foundations.

Prof. George Nakhnikian and Prof. Willis Doney both pointed out to me the serious problems raised by this passage.

concerning God's powers. Is it within God's power to destroy himself? It is "contradictory" to say that he can. Is there anything that God cannot do? Only that which implies a contradiction in its idea, that is, which is not "intelligible."²⁵

Descartes' doctrine seems to me to have been consistent through all his writings, after his initial announcement to Mersenne that God created the eternal truths. But it is difficult to state. He seems to have been saying something like this. God is all-powerful, and he has created all things. He has created the eternal truths, both as mathematical and physical laws, and as innate ideas in our minds. Although we have the ability to form clear and distinct concepts, and although we cannot conceive the contrary of these concepts, we have no guarantee that the objects of those concepts conform to or resemble them. There is thus the possibility of a doubt concerning this conformity. This is precisely the radical doubt of the first and second Meditations. Given the possibility of such a doubt, it may be extended to the laws of physics, the theorems of mathematics, and even to the principles of contradiction. God, as omnipotent, has the power to do anything whatever.

²⁵Meditations, VI, AT, IX, p. 57; to ***, Mar., 1642, AT, V, p. 544; to Regius, Oct. 6, 1642, AT, V, p. 547; to Mersenne, Apr. 21, 1641, AT, III, pp. 359-60.

But can God destroy himself? Such a question makes no sense. The "power" to destroy oneself is not a power at all, but a weakness. A god who had such a "power" would not be God the almighty, but some other creature. And similarly for the other stock objections: Can God create a stone which he cannot lift? Can God create another omnipotent God? And so on. A god who could do these things would not be God.

The final and most important question for Descartes is this: Could God deceive men, concerning the conformity of their clear and distinct ideas with their objects? Is God a deceiver? Again, the answer would seem to be that a god who would deceive men would not be God, but some creature who was less than perfect, and thus not God at all.²⁶

²⁶Since questions like these were an almost inevitable outcome of the voluntarist position, they were widely discussed. For a modern discussion, see C. Wade Savage, "The paradox of the stone," Philosophical Review, LXXVI, (1967), pp. 74-79. Descartes' position is discussed by Harry G. Frankfurt, "The logic of omnipotence," Philosophical Review, LXXIII (1964), pp. 262-63.

CHAPTER IX

THE PROBLEM OF ERROR

Descartes' proof, in the third Meditation, of the existence and veracity of God, leads to the problem of error. The purpose of the fourth Meditation is, in part, to provide a solution to this problem.

In the earlier Meditations, we found a faculty or power which was beyond the reach of the evil genius. This is the power of recognizing, or power of knowing, when it recognizes truth and falsehood. When it is applied only to simple concepts, it is called the "natural light," and its revelations are always true.

The proof that God is not a deceiver, however, has led to a problem. We know that we sometimes make mistakes. How can we avoid attributing these errors to God? Given that our cognitive faculties are essentially reliable, how does it happen that they often fail?

Because the fourth Meditation is rather abstract, I want to propose an example of the sort of problem Descartes seems to have been considering. This will help us in our reading of the Meditation.

For this purpose, the problem of Pappus, the triumphant solution to which is proposed in the Geometry, would be ideal.¹ It is, however, much more complicated than anything we will need here. Consider, instead, the following simple problem in algebra, which is very much like the problems in geometry and algebra of the Geometry and the Rules. We wish to find values for the unknown quantities x and y . We are given the following pair of equations:

$$(a) \qquad 3x + 2y = 10$$

$$(b) \qquad 4x + 7y = 22$$

The problem has a unique solution: $x = 2$ and $y = 2$. Now let us suppose that we have not been given all the data that are required for the solution. In particular, suppose that we have been given only equation (a), and not equation (b). There will now be an infinite number of pairs of values for x and y which will satisfy equation (a). If we choose one particular pair of values, it will only be an accident if it is the true solution which is also true for (b).²

¹Geometry, I, AT, VI, pp. 377-78. Cf. Laporte, Rationalisme, pp. 4-5.

²A contemporary distinction corresponding to that proposed here is that between "complete" and "incomplete" sequential machines. Cf. Seymour Ginsburg, An introduction to mathematical machine theory (Reading, Mass.: Addison-Wesley, 1962), p. 43.

We can now turn to the fourth Meditation. It begins by recalling the discovery, in the preceding Meditations, that we know very little with certainty about corporeal things, much more about the human mind, and still more about God. This Meditation, we learn, is to be concerned only with purely intelligible things, not with sensible or imaginable things. But the solution proposed here will provide the basis for an explanation of error in our sensing and imagining also.

After recapitulating the proofs of the third Meditation, Descartes turns to the central problem of this section. The argument is this. The will to deceive (as distinct from the ability to deceive) is a sign of weakness or malice. Fraud and deception are imperfections. God, who is perfect, cannot be the source of imperfection, and therefore God cannot deceive me. I experience a power or faculty of judging, which, like all things, is received from God. Since God is the source of this power, then I should never be deceived when I use it properly.

But I know by experience that I am subject to an infinitude of errors, even though this proof seems to show that I should never err. We must, therefore, reconcile the fact of error with the result of our proof that God could not be a deceiver. What, then, is the cause of our errors?

On the one hand, there is "a real and positive idea of God, or rather of a supremely perfect being," but

on the other hand there is, "so to speak, a certain negative idea of nothingness, that is, of that which is infinitely separated from every sort of perfection."³ I am a kind of mean between God and nothingness, or a mixture of being and nonbeing. On the basis of the causal principle, we may say that the being comes from God, but that the nothingness cannot come from God, since nothing comes from nothing. Thus, "I find myself exposed to an infinity of faults" (manquements, privations, lacks, imperfections). To be human, then, is to participate in nothingness. "Thus I know that error, insofar as it is error, is not something real which depends upon God, but that it is only a lack" (défaut, fault, imperfection). This I do not need a special "faculty for error." It is only necessary that "the power which God has given me to discriminate the true from the false is not infinite in me."⁴

I think that it will help to clarify the meaning of this very abstract passage (for we have no idea of how to interpret these lacks and privations), if we return to the example that I suggested at the beginning of this section. Given a very large number of unknown quantities to be determined, we are also given a finite number of simultaneous equations which constitute the data that we have, with which to determine the unknown quantities. We

³Meditations, IV, AT, IX, p. 43.

⁴Meditations, IV, AT, IX, p. 43.

find that we do not have enough data to determine all of the unknowns, and we are therefore unable to assign correct values to some of them. These turn out to be in error. God has not deceived us, because all of the data which have been provided have been accurate. If God had given us some false equations, some faulty data, we could justly accuse him of deception. But he has not. Some of the equations are lacking, but these gaps in our knowledge are nothing. Man's understanding is like this incomplete set of data, a kind of mixture of being and nothingness. We might add that in Descartes' physics, there is no void, and that by extension, we may say that these gaps in man's understanding do not exist in any sense. Man's understanding simply contains a finite set of data.

But this solution, for Descartes, is not adequate. There are, in fact, real gaps in the data, "for error is not a pure negation, that is, is not the simple defect or lack of some perfection to which I have no right, but is rather a privation of some knowledge which it seems that I ought to possess."⁵

Apparently, God, who certainly knows what data I require in order to arrive at a correct solution of my problems, has actually acted in such a way as to withhold these data. It is as though we were given a textbook in a foreign language, in which we were asked to translate a

⁵Meditations, IV, AT, IX, pp. 43-44.



given passage, but have found that the book's vocabulary omitted some of the required words. The vocabulary need not be infinite, but in a proper textbook, it should be adequate. Descartes' illustration is that of a craftsman, whose work need not be infinite, but who could at least make each piece perfect of its kind. Why, then, am I imperfect?

Descartes gives two answers, both of which are very puzzling. First, the idea occurs to him that "I ought not to be astonished, if my intelligence is not capable of comprehending why God does what he does, and that thus I have no more reason to doubt his existence than when it happens that I see many other things, without being able to comprehend for what reason, or how, God has produced them."⁶ Descartes argues that it will be necessary to exclude final causes, which are of no use in physics or the natural sciences, "because it does not seem to me that I can, without being presumptuous, search out and attempt to discover the impenetrable ends of God."⁷

Second, "one ought not to consider a single creature separately, when one inquires whether the works of God are perfect, but generally all the creatures together."⁸ Regarded, instead, as part of the total

⁶Meditations, IV, AT, IX, p. 44.

⁷Meditations, IV, AT, IX, p. 44.

⁸Meditations, IV, AT, IX, p. 44.

universe, the individual may be found to contribute to the perfection of the total pattern.

The second argument adds nothing to the first, since at this point Descartes does not yet know of the existence of other creatures in the universe, but only that God "could have produced them, in such a way that I exist and am placed in the world, making part of the universality of all the beings."⁹

This agnosticism regarding God's final causes, is puzzling, because it seems to undercut the principal argument of the Meditations as a whole. If God's purposes are ultimately beyond my knowing, then there is nothing whatever to justify my belief that God is not a deceiver. It may very well be part of the universal plan that I, alone, am subjected to total deception, perhaps providing entertainment for the rest of the inhabitants of the universe. This continual deception may thus fulfill some glorious purpose of God which I, as finite, will never be able to comprehend.

Since it is unlikely that Descartes really wanted this kind of an outcome, we ought to try to reconcile the argument of the fourth Meditation with that of the third. Let us say that God has provided Descartes with a large mass of data, in the form of innate ideas. These are dispositional properties of his mind such that he will

⁹Meditations, IV, AT, IX, p. 44.

recognize certain things when he is presented with them. In our example, these would be a large but finite set of simultaneous equations. We know that God could not have introduced errors into the data. Each item is known to be true insofar as it is clearly and distinctly conceived. The proof of the third Meditation is intended to demonstrate that these data are correct. By the natural light, we know that God does not deceive. Thus by means of our power of recognition, we can know that $2 + 3 = 5$, or that there can be no mountain without a valley, or that the sum of the squares on the legs of a right triangle equals the square on the hypotenuse.

We know these things, because we know that God is no deceiver. And we know that my personal deception cannot fulfill some "higher purpose" of God. It is simply self-contradictory to say that God could deceive, for the same reason that it is self-contradictory to say that God can destroy himself. God would not be God if he deceived people. Descartes states this point more clearly in the Principles:

That God is not the cause of our errors.

And the first of his attributes which seemingly ought to be considered here, consists in that he is very truthful and the source of all light, in such a way that it is not possible that he deceives us, that is that he is directly the cause of the errors to which we are subject, and which we experience in ourselves; for even though the skill to be able to deceive seems to be a mark of subtlety of mind among men, nevertheless the will to deceive never comes

except from malice or fear or weakness, and as a consequence cannot be attributed to God.¹⁰

When we say that God cannot deceive, we are not saying that there is some power which he lacks. On the contrary, to say that he could deceive would be to say that there was some weakness or lack of power in him. For this reason, no sceptic can make the assertion that God is a deceiver, since such a supposed assertion contradicts itself.

On the other hand, when we say that we do not comprehend God's purposes, we simply mean that we do not comprehend the particular motives or goals (all of what are admirable, by definition) that God had in giving me the finite set of truths that he did. Why has God provided me with this particular set of data, and not with some other set? In the total picture of the universe, why as I cut to this particular shape, and not some other? Questions like these simply cannot be answered. They would require that we have access to all the data of the universe, an infinite set, when, by assumption, we have access only to a finite set. We do not have adequate knowledge of anything, if we use "adequate" in the sense in which Descartes used it, to mean all that could be known about anything.

¹⁰Principles, I, 29, AT, IX2, pp. 37-38.

Descartes returns now to his analysis of intellectual errors:

I find that they depend upon the concurrence of two causes, namely, the power of recognizing which is in me, and the power of choosing, or rather my free-will; that is, my understanding together with my will. For by the understanding alone I neither affirm nor deny anything, but I conceive only the ideas of things, which I may affirm or deny.¹¹

Thus, in itself, the understanding is free of error, simply because it asserts nothing. (As we will see, however, when something is clearly and distinctly conceived by the understanding, the will is logically obliged to affirm it. If clear and distinct conceptions were not true, then the understanding might be responsible for error.)

"And even though there may perhaps be an infinity of things in the world, of which I have no idea in my understanding, one cannot say for that reason that he is deprived of these ideas, as of something which is rightfully due to his nature, but simply that he does not have them."¹² Thus we do not have the right to complain.

¹¹Meditations, IV, AT, IX, p. 45. The earlier Latin version uses facultate where the French has puissance or "power." It is important to recall here the earlier analysis in which we found that the understanding, for Descartes, consists of a passive power of recognizing (vis cognoscens, or power of knowing), and a quasi-active power of conceiving (vis intelligens).

¹²Meditations, IV, AT, IX, p. 45. Descartes' use of the word "infinite" here (une infinité de choses) seems to violate his careful distinction between "infinite" and "indefinite," which reserves the former term for God alone. Cf. Replies, I, AT, IX, pp. 89-90; Principles, II, 21, AT, IX2, p. 74. The earlier Latin version uses the term innumerae. AT, VII, p. 56.

On the other hand, the will is infinite, in the sense that I feel no outside force which constrains me to make one choice or another. The will "consists solely in that we can do a thing, or not do it (that is, affirm or deny, approach or shun), or rather only in that, in order to affirm or deny, approach or shun the thing which the understanding proposes to us, we act in such a way that we do not sense that any exterior force constrains us."¹³

Yet the will is not able to deny what the understanding conceives clearly and distinctly, or what God reveals directly. We might think that this is a limit upon the freedom of will, but Descartes does not. To the extent that the will is determined by my own understanding (or by God), so much the more freely does it choose. As

Actually, in the French version of the fourth Meditation, Descartes repeatedly uses the term "infinite" without observing such a distinction. For example, I am said to be subject to "an infinity of errors." AT, IX, p. 43. In the earlier Latin version, however, this is innumeris erroribus. AT, VII, p. 54.

Both Latin and French versions use the term "infinite" in connection with God's understanding. AT, IX, p. 45, AT, VII, p. 57.

I do not know why Descartes permits the word "infinite" to lose its unique application to God.

As Boyce Gibson points out, Descartes seems to have introduced the distinction between "infinite" and "indefinite" in order to avoid the church's condemnation of the view that the universe is infinite. His use of the term "infinite" in the French Meditations certainly seems to show that he did not take the distinction seriously. Alexander Boyce Gibson, The philosophy of Descartes (New York: Russell and Russell, 1967; reissue of 1932 edition).

¹³Meditations, IV, AT, IX, p. 46.

we will see, this characterization of "freedom" causes trouble for Descartes.

The will is not something which somehow operates independently of the human as an entity. The will is simply the human's ability to choose, as a dispositional characteristic of the mind. It is a "power . . . which consists solely in that we are able to do a thing, or not do it."¹⁴ Thus it makes no sense to speak of the understanding "constraining" the will, since these are not separable entities. It is only when some exterior force (other than God) forces us to act that we are unfree. In this sense, our will is never unfree.¹⁵

Descartes was not satisfied with this solution, as his later letters to Mesland and to Elisabeth make clear. In particular, he was not satisfied with the discussion of indifference here. In the fourth Meditation, indifference is seen as the lowest form of freedom. This is when we have no data at all upon which to form a judgment, and we select some response at random, as when someone says "Guess what!" to us, and expects an answer. This is seen to be

¹⁴"Une puissance . . . elle consiste seulement en ce que nous pouvons faire une chose, ou ne la faire pas." Meditations, IV, AT, IX, p. 46. ". . . quod idem, vel facere vel non facere . . . possumus." Meditations, IV, AT, VII, p. 77. Descartes' wording seems consciously to be avoiding the temptation to make the will into a thing.

¹⁵The letter to Mesland of Feb. 9, 1645, clarifies this point. The relevant passage is reproduced in the next chapter.

less perfect than when God reveals the truth to us directly, or when we understand a thing clearly and distinctly.

Considered merely in itself, everything that I conceive, or of which I have an idea, is simply what it is, and thus not in error. When I conceive a thing, I simply hold it before my mind. I do not necessarily recognize that it is true, add I do not necessarily judge that it is true. I simply consider it. Thus I might consider that "x equals 4," substituting this value in the equations that constitute my data. But this does not mean that I judge that x is 4, any more than my thinking about unicorns means that I think unicorns exist. A judgment is something added to the idea.¹⁶ There is no error in simply considering a thing. Error occurs when we assert, affirm, or approach a thing, or when we shun or deny it. But I can assert or deny anything whatever, if I can conceive it at all, to any extent. Thus I can assert or deny something which I do not fully understand.¹⁷ I am able to assert

¹⁶Cf. Geometry, I, AT, VI, p. 372: "If, then, we wish to solve any problem, we first suppose the solution already effected, and give names to all the lines that seem needful for its construction,--to those that are unknown as well as to those that are known."

¹⁷The French version clarifies a distinction here which seems terribly confusing in the Haldane translation of the Latin version. According to the French version, I can affirm or deny whatever I can conceive. This means that I can affirm or deny something which I do not understand. Meditations, IV, AT, VII, p. 58; AT, IX, p. 46; HR, I, pp. 175-76. Haldane uses "understand" in both cases to translate "intelligo."

things which are indifferent or undetermined in themselves. I am able to say, "x does equal 5," even though I do not have sufficient data to justify this assertion.

The examples which Descartes gives indicate that a clear understanding seems to entail a positive judgment. Thus, first, when I found that my existence followed very certainly (évidemment) from the mere fact that I was considering the question, "I could not prevent myself from judging that a thing which I conceived so clearly was true, not that I found myself forced to it by any exterior cause, but only because, from a great clearness [clarté, light] which was in my understanding, followed a great inclination in my will."¹⁸

On the other hand, there were things which I was able to doubt, for example, whether I am identical with a corporeal body, or different from it. Given the possibility of doubting, I could deny, affirm, or withhold judgment. Even when there is some evidence for one side or the other, such that a given thing is probable, I can still choose to affirm or deny it, or to withhold judgment.

We come now to a passage which will be crucial to our understanding of Descartes' theory of error. He begins with a restatement of his method:

If I abstain from giving my judgment upon a thing, whenever I do not conceive it with enough clarity and

¹⁸Meditations, IV, AT, IX, pp. 46-47.

distinctness, it is evident that I use my judgment well, and that I am not deceived; but if I determine myself to deny it, or affirm it, then I do not use my free will as I ought to; and if I affirm that which is not true, it is evident that I deceive myself, even also, when I judge according to the truth, that does not happen except by accident, and I fail all the same, and use my free will badly; for the natural light teaches us that recognition by the understanding ought always to precede the determination of the will, and it is in this misuse of the free will that the privation is found, which constitutes the form of error.¹⁹

The form of error is privation. This privation is associated with a misuse of the free will. The passage has a strongly Platonic sound in its use of the term "form." And the misuse of the free will would be like "mere opinion" for the Platonist. Still, there is the underlying mechanism of the Cartesian scheme that is not at all Platonic. The modern Jesuit author, P. H. J. Hoenen, describes this "mechanicist" element in Descartes as follows:

. . . It is clear that the new Mechanicism [i.e. Descartes'] is also established in an a priori way. Descartes accepts it for the following metaphysical reason: if intrinsic mutability were granted, then the new form that emerges in such a change must be supposed--falsely, however--to be ens quod and created therefore from nothing.²⁰

The causal principle requires that I cannot create an idea which contains more reality than its source. I

¹⁹Meditations, IV, AT, IX, pp. 47-48; cf. Replies, VI, 5, AT, IX, p. 230.

²⁰P. H. J. Hoenen, "Descartes' Mechanicism," in his Cosmologia (Rome: Gregorian University Press, 1949), tr. and reprinted in Doney, Descartes, p. 367.

cannot add to the data which I have in the form of innate, adventitious, or factitious ideas. ". . . the natural light makes be recognize with certainty [évidemment] that the ideas are in me like pictures, or images, which certainly can easily fall short of the perfection of the things from which they have been derived, but which can never contain anything greater or more perfect."²¹

If I choose to add something to an idea which I have, this addition has no reality of its own, but is simply a kind of random groping, as when a dull student in an arithmetic class simply guesses at the answers. Even if he happens to be correct, it is no more than an accident. And when error does occur, it is because of this random, groping addition that we make to the information that we have.

Gilbert Ryle has characterized Cartesian dualism in such a way that it seems to require an act of the will before the will can take effect. In this particular case, it appears that we must will that our will should follow our understanding. Descartes seems, at this point, to be making precisely the error of which Ryle accuses him. He seems to be saying that we must will to will to will . . . and so on, in an infinite series.²²

²¹Meditations, III, AT, IX, p. 33.

²²Gilbert Ryle, The concept of mind (New York: Barnes and Noble, 1949), p. 67.

The appeal to the natural light at this point may be the way in which Descartes avoids falling into an infinite regress, but at the cost of the kind of mechanism of which Hoenen accuses him. The natural light underwrites the principle that the will should follow the understanding. What has been taught by the natural light cannot be doubted, once it is clearly seen, so that the will is automatically determined by it. There is no need for a further act of the will, and thus no infinite series.

As we will see in the correspondence with Mesland and with Elisabeth, this solution posed a dilemma for Descartes. Let me simply state it here. If we are determined, by the teachings of the natural light, never to determine our will before recognition in the understanding--that is, before we have a clear and distinct idea or conception--then we fall into a kind of determinism or mechanism, since all our affirmations and denials are fully determined. On the other hand, if we are not determined in this way, then we must determine ourselves, through the use of the will. Here we fall into Ryle's trap, since each determination of the will requires a prior determination of the will before it can take effect. I do not think that Descartes was able to escape from this dilemma, and I think that the later correspondence will show how difficult it was for him.

Whatever we should do, there is no doubt that, in fact, we do give our assent to things which are not clearly and distinctly conceived:

For, actually, it is not an imperfection in God to have given me the freedom to give my judgment, or not to give it, upon certain things of which he has not given a clear and distinct knowledge in my understanding; but doubtless it is an imperfection in me, when I fail to use it well, and when I give my judgment precipitately, on things which I conceive only with obscurity and confusion.²³

Although the natural light teaches us that knowledge of the understanding ought always to precede the determination of the will, and although we may not thus be able to doubt the truth of this maxim, we may nevertheless disobey it. This gives a result which was to be repeated later and with emphasis in the correspondence with Father Mesland. Man is uniquely human and most similar to God in that he can affirm or deny anything whatever. But his understanding is limited. He can therefore affirm or deny a thing in the absence of clear and distinct understanding. Thus man's greatest perfection, his free will, can lead to sin and error

I see nevertheless that it would be easy for God to do things in such a way that I might not ever deceive myself, even though I remained free, and of a limited knowledge [connaissance], in the following way: by giving to my understanding clear and distinct information concerning all the things about which I ought ever to deliberate, or even if he had so deeply engraved in my memory the resolution never to judge

²³Meditations, IV, AT, IX, p. 48.

anything without conceiving it clearly and distinctly, so that I might not be able to forget it.²⁴

Once again, the solution offered is agnosticism concerning the final causes of the universe, and a reaffirmation of man's finitude. It is said to be, somehow, a greater perfection in the universe to have some parts incomplete, than to have all parts identically perfect. But I can avoid error--Descartes is too much of a Renaissance man to end on a note of despair about man's finitude--by refraining from judgment when my information is incomplete. By "acquiring in this way the habit of not failing," I acquire "the greatest and principal perfection of man." I cannot be deceived, "because every clear and distinct conception is doubtless something real and positive, and thus cannot take its origin from nothingness, but must necessarily have God for its author, God, I say, who, being supremely perfect, cannot be cause of any error; and as a consequence it is necessary to conclude that such a conception or such a judgment is true."²⁵

²⁴Meditations, IV, AT, IX, pp. 48-49. "Information" here, in the French version, is intelligence rather than the Latin version's perceptionem. In classical French, intelligence suggested occult knowledge or secrets. Descartes is saying that God might have let him in on all the secrets of the universe. This passage and the earlier appeal to man's ignorance of the purposes of God might be compared to Job 38:4 - 42:6.

²⁵Meditations, IV, AT, IX, pp. 49-50.

In this reading of the fourth Meditation, one central problem has appeared. Descartes appears to be trying desperately to save room for man's free will, at the cost of making a key term, "perfection," ambiguous in the extreme: "And finally I ought not to complain, either, in saying that God concurs with me in order to form the acts of the will, that is, the judgments in which I deceive myself . . . and there is, in some way, more perfection in my nature, in that I am able to form them, than if I could not." Such a principle is scarcely self-evident.²⁶

As Descartes himself has pointed out, it is possible to imagine a universe in which humans were immune from error, either because they had full information about all questions that they would face, or because they never passed judgment when information was lacking. It does not seem to me that Descartes has given any argument in favor of the view that it is a "greater perfection" to have a free will which can lead to error.

²⁶Meditations, IV, AT, IX, p. 48. See, for example, B. F. Skinner's arguments in favor of a society in which free choice is reduced to a minimum, in order to maximize the happiness of the inhabitants. B. F. Skinner, "Freedom and the control of men," American Scholar, XXV (1955-56), p. 63.

CHAPTER X

THE WILL IN THE LATER LETTERS

We have seen that the doctrine of the will plays a critical role in the solution to the problem of error proposed in the Meditations. Man's will is such that he can form judgments concerning anything whatever, including those things which he does not conceive clearly or distinctly. When he does so, it is possible for him to make errors. Thus man, and not God, is responsible for man's errors.

Such a solution requires that the will be free. If man were not responsible for his judgments, then some other source of error would have to be found, and it might not be possible to acquit God of the charge of having deceived man. The consequences for ethics would be even more serious than those for epistemology. For if no one was responsible for his own moral acts, then no one could be justly punished for his misdeeds.

On the basis of our earlier discussion of the will and the understanding, we can see clearly the extreme difficulty that Descartes' theory of mind has caused.

The understanding, in its "passive" role, recognizes the truth or falsehood of certain things, such as

the common notions. But, in addition, the will, through the power of judgment, is given the right to affirm or deny the truth of anything whatsoever. Descartes has therefore established two quite different faculties of the mind, both of which can pronounce upon the truth or falsehood of certain objects. The problem, then, is whether it is possible for the will to deny the truth of something which is recognized as true by the understanding.

The power of recognizing is quasi-passive, recognizing the simple natures, the common notions, the clear and distinct concepts, and perhaps other objects. The will, however, is active, and if it is to be free and infinite, as Descartes claims that it is, then perhaps it must be granted the right to affirm or deny anything whatever. This would seem to mean that it has the right to deny the truth of the common notions, and of the clear and distinct ideas. But this would mean disaster for the Cartesian system. It would mean that the sceptic could meaningfully deny the truth of the cogito, and of the proof of the existence and veracity of God.

On the other hand, if the will is not free, then the line of argument of the fourth Meditation is threatened, although it is not destroyed. It can be saved if we give the understanding dominance over the will, so that whenever the power of recognizing calls something true, then the will is compelled to affirm it. In this

way, the sceptic cannot doubt the truth of certain things, but the will can still affirm or deny an infinite number of other things--specifically, those ideas which can be present to the mind but which are not clear and distinct.

But this solution is not a happy one. The will is forced to give its assent to certain things--simple natures, common notions, clear and distinct conceptions. But these, according to the Cartesian method, are the only things to which it should give its consent. To affirm or deny anything else may lead to error.

Why, then, do we have a will at all? If God is not a deceiver, why did he not construct man in such a way that he had no will which was not wholly dependent on the understanding?

It seems to me that this problem becomes particularly acute in the period following publication of the Meditations and the Principles. We can trace this development with painful clarity in Descartes' later letters.

Before about 1644, Descartes seems to have maintained consistently that the will always chooses whatever the understanding represents as good or true: ". . . our will is not disposed to follow nor to flee anything, except according as our understanding represents it to it as good or bad."¹ Similarly, ". . . if the understanding

¹Discourse, III, AT, VI, p. 28.

represents anything to the will as good, whenever it is good, then the will can not fail in its choice."² Again, it is a common notion or axiom that "The will is carried voluntarily, and freely (for that is of its essence), but nevertheless infallibly, to the good which is clearly recognized by it."³

In the set of Replies to Hobbes, Descartes seems to claim that it would involve a logical contradiction to say that we "fail to will" a thing and that, at the same time, we "give our credence" to it, and he also seems to say that we give our credence to everything that we conceive clearly:

But, when it is said here that, "whether we will, or fail to will, we give our credence to things which we conceive clearly," it is the same as if one said that, "given that we will, or that we fail to will, we will and desire the good things, when they are clearly recognized by us"; for that manner of speaking, "whether we fail to will," has no place in such occasions, because there is a contradiction in willing and not willing the same thing.⁴

Is it possible for a person to recognize a thing to be wholly evident and simultaneously to refuse to admit it? In the letters to Princess Elisabeth and Father Mesland during the years 1644 and 1645, we will see Descartes

²To Mersenne, April 27, 1637?, AT, I, p. 366.

³Replies, II, Proofs of the existence of God, Axiom VII, AT, IX, p. 128.

⁴Replies, III, 13, AT, IX, p. 150.

apparently maintaining contradictory opinions on this question.

It is difficult to suppose that Descartes had any good reason for dissembling his views to either of these correspondents. He told the Princess that she had the most noble soul he had ever known.⁵ She had been deposed from the throne in Bohemia, and she was living in extreme poverty with other members of her ill-fated family in Holland. She therefore has little political power. And, as a Protestant, she was not likely to betray any of Descartes' unorthodoxies to the Jesuits. While her troubles gave Descartes an excuse to preach the Stoic virtues, it is unlikely that he would have been insincere in his correspondence with her.

Father Mesland, too, was a devoted disciple, who in 1646 was exiled to Canada, apparently for his advocacy of Cartesian opinions. There is little reason to think that Descartes would attempt to deceive him, either.⁶

There are five letters to Mesland, dating from May 2, 1644, to some time in late 1645 or in 1646, the last being Descartes' response to Mesland's "adieu forever," as the priest leaves for exile.

⁵To Elisabeth, May 18, 1645, AT, IV, p. 203.

⁶Alquié believes that the letters to Mesland are of the greatest importance, as illustrations of a radical change in the doctrine of the will, which carries Descartes even further from Scholasticism. Alquié, OP, I, 598, II, 593, II, 626; Alquié, Descartes, pp. 146-47.

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In the first of these letters, Descartes gives a very striking and unequivocal picture of the understanding as passive. It is no longer as it was in the Rules, sometimes the wax and sometimes the seal. Now, it is only the wax:

I do not find any other difference between the soul and its ideas than that between a piece of wax and the various figures that it may receive. And as it is not properly an action, but a passion of the wax, to receive various figures, it seems to me that it is also a passion in the soul to receive this or that idea, and that only its volitions are actions; and that its ideas are placed in it, partly by the objects which touch the senses, partly by the impressions which are in the brain, and partly also by the dispositions which have previously been in the soul itself, and by the movements of the will; just as the wax receives its figures, partly from other bodies which press it, partly from figures or other qualities which are already in it, as from the fact that it is more or less heavy or soft, etc., and partly also from its movement, when, having been acted upon, it has in itself the force to continue to move itself.⁷

In his earliest writings, the Rules and L'homme, Descartes used wax as an analogue of certain functions of the mind or brain.⁸ But I believe that this is the first time that he has tried to represent the understanding as wholly passive. If we combine this representation with the advice of the Meditations, we have a curious result. We are told there that recognition by the understanding ought always to precede determination by the will.⁹ This

⁷To Mesland, May 2, 1644, AT, IV, pp. 113-14.

⁸Rules, XII, AT, X, p. 415; L'homme, AT, XI, p. 171.

⁹Meditations, IV, AT, IX, p. 47.

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leads to a strangely passive picture of the human mind, in which the only role of the will is to affirm what the wax-like understanding has recognized as good or true.

This seems to be the sort of position that Descartes is proposing in this letter when he considers the reasons that the will might fail to follow the understanding:

. . . it is, it seems to me, certain that "from a great light in the understanding follows a great inclination in the will"; to the extent that, seeing very clearly that one thing is proper for us, it is very difficult, and even, as I believe, impossible, as long as one remains in that thought, to arrest the course of our desire. But, because the nature of the soul is to be almost only for a moment attentive to the same thing, so quickly is our attention turned away from reasons which make us know that that thing is proper for us, and that we retain only in our memory what has appeared desirable to us, we are able to represent to our mind some other reason which makes us doubt it, and thus to suspend our judgment, and even also perhaps to form a contrary to it.

. . . I do not believe that, to do evil, there is need of seeing clearly that what we do is evil; it is enough to see it confusedly, or only to remember that one has judged earlier that it was evil, without seeing it in any fashion, that is to say, without paying attention to the reasons which proved it; for, if we saw it clearly, it would be impossible for us to sin, during the time that we see it in that way, that is why it is said that "every sinner is so by ignorance."¹⁰

It is the letter to Mesland of Feb. 9, 1645, that is of central importance in understanding Descartes' later doctrine of the will. For this reason, I want to reproduce a long fragment of the letter in its entirety:

¹⁰To Mesland, May 2, 1644, AT, IV, pp. 115-17. The passages in quotation marks are in Latin in the original.

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As for the free will, I agree entirely with what the Rev. Father [Petau?] has written about it. And, in order to set forth my opinion more completely, I would want to note, on this subject, that "indifference" seems to me properly to signify the state of the will when it is not impelled to one side or the other by the perception of the true or of the good; and it is in this sense that I took it when I wrote that the lowest degree of freedom is that at which we determine ourselves to things to which we are indifferent. But perhaps others understand by "indifference" a positive faculty for determining oneself to one or the other of two contraries, that is, to following or fleeing, to affirming or denying. I have not denied that this positive faculty is in the will. Even more, I hold that it is there, not only in those acts in which it is not impelled by evident reasons toward one side rather than the other, but also in all the other acts; to the point that, when a very evident reason moves us to one side, even though, morally speaking, we can hardly bring ourselves to oppose it, nevertheless, absolutely speaking, we can do so. Actually, it is always possible for us to refrain from following a good which is clearly recognized, or from admitting an evident truth, provided that we think that it is good to testify, by doing so, to our free will.

Moreover, it ought to be noted that freedom can be considered in the actions of the will before they take place, or while they are taking place.

When we consider these actions before they take place, they involve indifference taken in the second sense, and not in the first. And even though we might be able to say, when we oppose our own judgment to the commands of others, that we are more free to do the things which have not been prohibited, and in which we are permitted to follow our own judgment, than to do what we are forbidden to do, we cannot say in the same way, when we oppose some of our judgments or our cognitions to one another, that we are more free to do the things which do not seem to us to be either good or bad, or in which we see as much good as bad, than to do those where we see a great deal more good than bad. A greater freedom really consists either in a greater facility to determine oneself, or in a greater use of that positive power which we have to follow the worse, even though we see the better. If we take the side in which we see the greater good, we determine ourselves more easily; if we follow the contrary side, we use more of that positive power; thus, we are always able to act more freely in the things where we see more good than bad, than in those things which we call

ἀδιάφορα, or indifferent. It that sense one can even say that the things which are commanded of us by others, and which we would not do by ourselves without being commanded, we do less freely than those which are not commanded of us; because the judgment that they are difficult to do is opposed to the judgment that it is good to do that which is commanded, and, the more that these two judgments move us equally, the more they make us indifferent in the first sense.

Considering freedom now in the actions of the will, while they are taking place: this freedom does not imply any indifference, whether it is taken in the first or in the second sense; because what is done cannot remain undone, given that it is done. But it consists only in the facility with which it is executed, and thus, "free," "spontaneous," and "voluntary" simply mean the same thing. It is in this sense that I wrote that I am carried all the more freely toward something when I am impelled by more reasons, because it is certain that our will is then moved more easily and with greater impetus.¹¹

In this fragment, Descartes comes very close to reversing his earlier position, because he seems to assign nearly total dominance to the will. Alquié claims that ". . . Descartes goes to the point of declaring that in this sense we give proof of a greater freedom when, seeing the better, we choose the worse. There is therefore a possibility of refusing the true and the good in full clarity, which constitutes the tragic essence of human freedom."¹²

¹¹To Mesland, Feb. 9, 1640, AT, IV, pp. 173-74. The text appears in three forms: A French version, translated from the Latin by Clerselier and identified by him as a letter to Mersenne, AT, III, pp. 378-82; a Latin re-translation of this; and a Latin version, identified as a fragment from a letter to Mesland. My translation is based on this last, and on the modern French version of OL, pp. 1177-78.

¹²Alquié, Descartes, p. 146.

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Descartes' position is certainly extreme, even though he claims that it is "morally impossible" to refuse the good and the true. Speaking absolutely, it is possible to deny an evident truth. It is not clear to me that Descartes means to assert that we can believe the contrary of something which is revealed to us by the natural light. His development of his position seems to hedge, in two ways. First, he speaks in terms of outward behavior only. We can refrain from following a good, or from admitting a truth, but this does not mean that we can refrain from judging that something is good or true when we see it clearly. We cannot, then claim that he has said that we may judge a thing to be false when we clearly and distinctly conceive it, and recognize that it is true. Second, he makes the behavior itself depend upon an additional act of the will, in that "we think that it is a good thing to testify" to our freedom. Descartes does not commit himself concerning the nature of this additional judgment, but there is no reason to believe that it violates the principles laid down in the earlier works. There is thus no real reason to suppose that the earlier view has not been maintained intact. Lacking further evidence, we may tentatively conclude, then, that Descartes maintains the dominance of the clear understanding over the will, even in this letter to Mesland.

However we decide to regard the fragment to Mesland of Feb. 9, 1645, Descartes could not have held this radical doctrine very long, if he held it at all. In the letters to Elisabeth, especially those written during the last half of 1645, Descartes develops a doctrine which is the very opposite of this. As we will see, all man's acts, including those of his will, are said to be wholly dependent upon the will of God.

The doctrine of these letters to Elisabeth is particularly interesting because it does provide a place for man's freedom and responsibility within a system in which everything depends on God's will. Coming as it does at the end of Descartes' productive career, it represents his last attempt at a solution to the problem of error.

At the time of the following letter, which follows more than two years of correspondence, Descartes is just completing The Passions of the Soul, which was written for Elisabeth. After mentioning his difficulty in enumerating all the passions, Descartes continues:

. . . all the reasons which prove the existence of God, and that he is the first and immutable cause of all the effects which do not depend on the free will of men, prove, it seems to me, in the same way that he is also the cause of all the actions which do depend on it. For one would not know how to demonstrate that he exists, except in considering him as a supremely perfect being; and he would not be supremely perfect, if something could happen in the world, which did not come entirely from him. It is true that faith alone teaches that it is only by grace that God raises us to a supernatural beatitude; but philosophy alone is enough for us to recognize that the least thought would not be able to enter into the mind of man, if

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God did not wish and had not wished from all eternity that it enter there.

. . . God is the universal cause of everything; he is in the same way the total cause; and thus nothing can happen without his will.¹³

Such a view would surely make it seem that God was wholly responsible for human error and sin, and that man was thus wholly irresponsible. Man therefore could not be justly punished for his sins, nor could he be held accountable for his errors of judgment, inasmuch as every act of the human will has been foreordained by God.

Descartes attempts to salvage his theory of error in the following passage from a letter to Elisabeth, written a month after the preceding one:

Concerning the free will, I claim that as long as we think only of ourselves, we cannot fail to believe that it is free; but when we think of the infinite power of God, we cannot fail to believe that all things depend on him, and, as a consequence, that our free will is not exempt from his power. For it would imply a contradiction to say that God has created men of such a nature that the actions of their will did not depend upon his own, because it is the same as if one said that his power, taken all together, is finite and infinite; finite, because there is something which does not depend on it; and infinite, because he has been able to create that independent object. But, as the recognition of the existence of God ought not to prevent us from being assured of our free will, because we experience it and sense it in ourselves, so also the existence of our free will ought not to make us doubt the existence of God. For the freedom which we experience and sense in ourselves, and which is enough to render our actions praiseworthy or blameworthy, is not incompatible with a dependence which is of another nature, according to which all things are subject to God.¹⁴

¹³To Elisabeth, Oct. 6, 1645, AT, IV, pp. 313-14.

¹⁴To Elisabeth, Nov. 3, 1645, AT, IV, pp. 332-33.

The position that Descartes must maintain, then, is this: That we know by direct experience that our will is free, and we know by means of a proof that the will is dependent upon God. We cannot discard either element in this dilemma without endangering the rest of the system. Therefore, in good Scholastic fashion, when faced with a dilemma, we must make a distinction. Descartes will distinguish two sense of the term "depend," according to which all things depend upon God, in one sense, while man's will is independent or free, in another sense.

Thus, two months later, Descartes responds to Elisabeth's bewilderment with a story:

. . . I pass to that difficulty that Your Highness proposes in connection with the free will, of which I will attempt to explain dependence and freedom by a parable. If a king who has forbidden duels, and who knows very assuredly that two gentlemen of his kingdom, living in separate cities, are having a quarrel, and are so angry with one another, that nothing would prevent them from fighting if they met one another; if, I say, that king gives to one of them some commission to go on a certain day to the city where the other is, and if he also gives a commission to the other to go on the same day toward the place where the first is, he knows very assuredly that they will not fail to encounter one another, and to fight with one another, and thus to violate his prohibition, but he does not constrain them to do so by that; and his knowledge, and even the will which he has had to determine them to it in that way, does not prevent its being voluntarily and freely that they fight, when they come to encounter one another, as they would have done if he had known nothing of it, and if it was by some other occasion that they had encountered one another, and they can also justly be punished, because they have violated his prohibition. But what a king can do, in connection with some free actions of his subjects, God, who has preknowledge and an infinite power, does infallibly in connection with all the free actions of men. And before he sent us into this

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world, he knew exactly what all the inclinations of our will would be; it is he himself who has placed them in us, it is he also who disposed all the other things which are outside of us, so that such-and-such objects present themselves to our senses at such-and-such times, on the occasion of which he knew that our free will would determine us to this or that thing; and he has also willed it, but he has nevertheless not willed that our free will would be constrained to do it. And as one can distinguish in this manner two different degrees of will, the one by which the king has willed that these gentlemen fight together, because he has made them encounter one another, and the other by which he has not willed it, because he has forbidden duels; thus the theologians distinguish in God an absolute and independent will, by which he has willed that all things do just what they do, and another which is relative, and which is connected to the merit or demerit of men, by which he wishes his laws to be obeyed.¹⁵

This explanation seems particularly unsatisfactory in the way that it relegates the crucial action (in the tradition of the French classic drama) to an off-stage position: the gentlemen have already made their decision before the curtain has risen, and it is for this decision that they are to be held culpable, since one of the givens in the parable is that the decision is irrevocable. If the parable were to be an accurate analogy, however, the king would have to have determined the initial decision as well as the subsequent actions. And if the king has determined the feud as well as the encounter, it is difficult to see why he is not responsible for the duel itself.

I am not sure that Descartes has a solution to this problem. But it seems an inevitable outcome of the volun-

¹⁵To Elisabeth, Jan., 1646, AT, IV, pp. 352-54.

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tarist position, and it would be surprising if there were not some solution to it within the more adequate statement of that position by Pierre d'Ailly. Using d'Ailly's terms, I think that we can construct a solution to the problem for Descartes. The theological distinction that he mentions at the end of this passage seems to resemble the distinction that d'Ailly makes between the "absolute" and the "ordained" powers of God. We can then say that in an absolute sense, man's will does depend upon God, but in the second sense, part of this power has been given to man. That is, God could nullify man's free will, but he does not do so, because as one of his absolute decrees, he has ordained that man's will be free.

Given this scheme, we can interpret the story that Descartes tells as follows. Let the king have the ordained powers of God. Then let some super-king, say the emperor, hold the absolute powers of God. The emperor has determined all the laws of nature, and all the moral laws. And he has determined the will of each person, according to some set of final goals that only he understands.

Now the king, who has only the ordained powers of God, prohibits dueling, and sends the two men out to their inevitable rendezvous. Who, then, is responsible for their illegal behavior? The king is not, because it was the result of a free decision on the part of the gentlemen, which the king did not control. And the emperor, although

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responsible in a sense, is not culpable, because his determination of their wills fulfills some worthy purpose which could not be known to anyone but the emperor.

I am not completely convinced that this interpretation solves the problem for Descartes. Although we may have shown that neither the king nor the emperor is responsible and culpable, we have not shown that the men themselves are responsible for the duel either. I do not know how Descartes could have dealt with this problem.¹⁶

¹⁶Two or three years later, Descartes makes the distinction between absolute and relative powers even clearer:

"Objection. But where do the ideas of possible things come from, which precede the will?

"Reply. These things and all others depend on God; for his will is not only the cause of actual and future things, but also of possible things and of simple natures, and nothing can be, or ought to be, imagined which we would say did not depend on God.

"Objection. But then, couldn't God have commanded the creature to hate him and established that to be the good?

"Reply. Now he can no longer do so. But we do not know what he could have done. And why could he not have commanded the creature to do that?" Burman, AT, V, pp. 159-60.

See also the discussion of the letter to Elisabeth in Gottfried Wilhelm Leibniz, Theodicy, edited, abridged and with an introduction by Diogenes Allen (Don Mills, Ontario: J. M. Dent and Sons (Library of Liberal Arts), 1966), sec. 162-65, pp. 97-99.

Leibniz calls attention to Aquinas' distinction between the antecedent and consequent will of God.

Aquinas, in turn, gives credit for the distinction to Damascene. Aquinas, Summa Theologica, I, Q. 19, art. 6; vol. I, p. 204 (Pegis, ed.)

It does not seem to me that this particular distinction will be of much help to voluntarists like Descartes, who hold that God's will is responsible for the eternal truths. Consider Aquinas' example: A judge wills that all men should live. (This is his antecedent will.)

His task has been twofold. On the one hand, he must absolve God of the responsibility for man's errors. On the other hand, he must make man responsible for his errors, but through his misuse of an apparatus which is basically reliable.

It is easy to understand Elisabeth's bewilderment at Descartes' solution. His answer to the problem of error in the Meditations depends upon the freedom and autonomy of man's will. In discussing the letters to Mesland, we have seen that Descartes finds it very difficult to push the doctrine of autonomy to its limit. It is still

But the rules of justice force him to condemn a murderer to death. Thus he wills the death of the murderer. This, however, is his consequent will, which is entailed by the antecedent will and by the laws of justice.

For Descartes, however, the laws of justice are also the result of God's will. Thus there is no sense in which the judge is "forced" to cause the death of the murderer. He need only modify the law of justice. Descartes can avoid this difficulty by making consistency part of the definition of God--that is, he would not be God if he were inconsistent. (Descartes does not actually state the case this strongly: ". . . it is easy to believe that God, who, as everyone ought to know, is immutable, always acts in the same way." Le monde, VII, AT, XI, p. 38. I do not know of a stronger statement than this.)

But Descartes is in even worse trouble. In the letters to Elisabeth, and in the Principles, God's will is responsible for every act of man's will. Cf. Principles, I, 41, AT, IX2, p. 42. Descartes here declares that the reconciliation of God's omnipotence with man's free will is "incomprehensible."

Descartes seems to have ascribed entirely too much to God's will: (1) antecedent moral law, (2) eternal and consistent justice, (3) individual's act of will, in sinning, and (4) consequent punishment of crime.

"morally" impossible for man to deny the truth of what he clearly and distinctly conceives. And it seems to Descartes to be an unacceptable limitation upon God's powers to permit the existence of anything which is not wholly dependent upon him.

Rejection of the doctrine of autonomy, however, seems to entail consequences which are equally disastrous. When pushed to its conclusion, the solution proposed in the letters to Elisabeth must be that God has ordained the laws of ethics, ordained men's decision to break these laws, ordained the actual violation, and, in the end, ordained punishment for the crime. I think that we can certainly understand Descartes' reluctance to discuss ethical problems, if this is the sort of solution to which he comes.¹⁷

In the end, it may be that the problem of human freedom and divine omnipotence has no solution. The question, "Can God create a human will which he does not control?" is rather like the question, "Can God create a stone which he cannot lift?" But we can reject the second question, since we have no evidence that such a stone exists, and we feel very sure that no such stone can exist.

¹⁷A discussion of the conflict between divine and human freedom in Descartes is found in Sartre's introduction to his collection of Descartes's writings. Jean-Paul Sartre, "Cartesian freedom," in his Literary and philosophical essays (New York: Collier Books, 1962), pp. 180-97, tr. and reprinted from Descartes (Paris: Trois collines, 1946), pp. 9-52. See also Replies, VI, 6, AT, IX, p. 233.

We cannot reject the first question, however, because we seem to have the strongest kind of evidence that man does have a free will. Apparently, at the end of his life, Descartes' response to human freedom was the same as that proposed in his very earliest writings. Man's freedom is a miracle: "The Lord has accomplished three wonders: things from nothing, the free will, and the Man-God."¹⁸

We turn now to the topic which has motivated this discussion of ethical freedom and responsibility, the problem of error. The solution to the problem of error proposed in the Meditations depends upon man's misuse of the will, to affirm or deny things which he does not clearly and distinctly conceive. If, however, each act of the will has been determined, in detail, by God, then God is responsible for man's errors. God has created the eternal truths, and thus he cannot be said to have ordained those truths according to some pre-existing standard. On the other hand, his detailed determination of man's will to error does violate the standard which he himself has ordained, and thus violates the ordained powers of God. When a man judges the square tower to be round, the sticks in the water to be bent, or the sun to be the size of a saucer, it is God himself who has willed these errors.

God, therefore, is a deceiver.

¹⁸Cogitationes privatae, AT, X, p. 218. Cf. Burman, AT, V, p. 156. Notice that God can violate the causal principle, since he can make something from nothing.

CHAPTER XI

LEVELS OF CERTAINTY IN THE PRINCIPLES

The concluding sections of the Principles contain a clear statement of the levels of certainty which Descartes distinguished, and it will be useful to have them before us. I am following the French version, which, like the textbook it was intended to be, is extraordinarily stilted, wooden, and dull. But it was heavily revised by Descartes and strongly recommended by him to his correspondents. Adam even believes that most of the Principles (from III, 41, onward) were written out in French in Descartes' own hand. If this is so, then the French version is surely to be preferred.

After the claim, at IV, 200, that he has used no principle which was not received and approved by Aristotle and "all the other Philosophers who have ever been in the world," and, at IV, 201, that "it is certain that sensible bodies are composed of insensible parts" which "are so small that they cannot be sensed," Descartes wishes to determine precisely how much certainty we are to accord to these hypothetical entities of his science. The problem with which Descartes is dealing here is a central one in

contemporary philosophy of science, and Descartes' attempt to solve this problem may therefore be of considerably more than merely historical interest.

We begin at Principles, IV, 204:

204. That, in connection with the things which our senses do not perceive [aperçoivent], it is sufficient to explain how they could be; and that that is all that Aristotle tried to do.

To this, someone will reply that, even though I may have imagined causes which might be able to product effects similar to those which we see, still we should not conclude that what we see is produced by them. Because, just as an industrious clock maker can make two watches which mark the hours in the same fashion, and between which there is no difference in what appears on the outside, but which still do not have anything similar in the makeup of their cogwheels: in the same way it is certain that God has an infinite number of different ways, by each one of which he could have made it so that all the things of this world appear just as they now appear, without its being possible to the human mind to recognize which of all these ways he wanted to use to make them. I have no difficulty in granting all this. And I will believe myself to have done enough, if the causes which I have explained are such that all the effects that they can produce are found to be similar to those which we see in the world, without inquiring if it is by them or by other causes that they are produced. I even believe that it is just as useful for life to recognize causes which are imagined in this way, as if one actually recognized the true causes: for Medicine, Mechanics, and in general all arts for which the knowledge of Physics could serve, have as their goal only to apply some sensible bodies in such a way that, by the succession of natural causes which we have imagined in this way, even though they are false, as if they were the true causes, given that that succession is supposed similar, insofar as the effects are concerned. And, so that one might not think that Aristotle had ever pretended to do something more than that, he himself said, at the beginning of the seventh chapter of the first book of his *Meteors*, that "concerning that which pertains to things which are not manifest to the senses," he thinks that he "has demonstrated enough, and as much as one can reasonably desire, if he can only show that they can be such as he explains them."

205. That nevertheless one has a moral certainty that all the things of this world are such as has here been demonstrated that they could be.

But nevertheless, in order not to injure the truth, by supposing it to be less certain than it is, I here distinguish two sorts of certainty. The first is called moral, that is, sufficient to provide rules for our customary actions [moeurs], or as great as that which we have concerning the things which we do not customarily doubt concerning the conduct of life, even though we may know that it could happen, speaking in terms of absolutes, that they might be false. Thus those who have never been to Rome do not doubt that it is a city in Italy, even though it could happen that all those from whom they have heard about it might have been lying. And if someone, in order to decode a cypher written with ordinary letters decides to read a B wherever there will be an A, and to read a C wherever there will be a B, and thus to substitute in the place of each letter that which follows it in the order of the alphabet, and if, reading it in that fashion, he finds words there which make sense, he will not doubt that that is the true sense of the cypher, which he will have found in this way, even though it might be that whoever wrote it might have used another which was wholly different, giving another signification to each letter: for that would be so unlikely to happen, especially when the cypher contained a large number of words, that it is not morally credible. But, if one considers how many different properties of the magnet, of fire, and of all the other things which are in the world, have been very evidently deduced from a very small number of causes which I proposed at the beginning of this treatise, even though it might be imagined that I had supposed them haphazardly, and without being persuaded of them by reason, there will be at least as much reason to judge that they are the true causes of all that I have deduced from them, as to believe that the true sense of a cypher has been found when it is seen to follow from the signification that has been given by conjecture to each letter. For the number of letters of the alphabet is much greater than that of the first causes which I have supposed, and it is not customary to use so many words, nor even as many letters, in a cypher, as I have deduced different effects from these causes.

206. And that there is a certainty about them which is more than moral.

The other sort of certainty is when we think that it is impossible that the thing be other than we

judge it to be. And it is founded upon a metaphysical principle which is most assured, which is that, since God is supremely good and the source of all truth, inasmuch as it is he who has created us, it is certain that the power or faculty which he gave us for distinguishing the true from the false, does not deceive, when we use it well and when it shows us evidently that a thing is true. Thus this certainty extends to all which is demonstrated in Mathematics; for we see clearly that it is impossible that two and three joined together should make more or less than five, or that a square should have only three sides, and similar things. It also extends to the recognition that we have that there are bodies in the world, for the reasons explained above at the beginning of the second part. Next, it extends to all the things which can be demonstrated, concerning bodies, by the principles of Mathematics or by other principles which are equally evident and certain; and it seems to me that these should include those which I have written in this treatise, at least the principal and most general of them. And I hope that they will actually be received by those who will see clearly the whole succession of deductions that I have made, and how evident are all the principles of which I have made use; principally if they properly understand that we cannot sense any object, except by means of some local movement which that object excites in us, and that the fixed stars could not excite any movement in our eyes in this way, without moving also, in some fashion, all the matter which is between them and us from which it follows most evidently that the skies must be fluids, that is, composed of small parts each of which moves separately, or at least that there must be such particles in them. For all that I can be said to have supposed, and which is found in article 46 of the third part, can be reduced to the supposition that the skies are fluid. So that if that point alone is recognized as being sufficiently demonstrated by all the effects of light, and by the succession of all the other things that I have explained, I think that it ought also to be recognized that I have proved, by Mathematical demonstrations, all the things that I have written, at least the most general, which concern the fabric of the sky and of the earth, and in the fashion in which I have written them: for I have been careful to propose as doubtful all the things which I thought to be so.¹

¹Principles, IV, 204-206, AT, IX2, pp. 322-25.

A short concluding section states Descartes' ultimate obedience to the judgments of the church, a warning not to ascribe anything to him which he has not written, and, finally, what I find to be the most attractive characteristic of Descartes' method, an appeal to his readers to examine his work, and "to receive only what the force and evidence of reason can constrain them to believe."²

We may distinguish several levels of certainty within the Cartesian scheme:

(1) Our ideas, considered merely in themselves, as intuited, "seen," or recognized, can scarcely be doubted. They are the very content of our thought. If truth is a conformity between a concept, thought or idea, and its object, the idea alone cannot be false. In fact, it makes no sense to speak of a thought as "true" or "false," since these terms refer to the relationship between the thought and its object. The unique exception is the thought which is expressed by the proposition, "I think," or "I doubt," which has itself as its object.³

(2) The indefinite class of propositions which Descartes calls "common notions," or "axioms," and to

²Principles, IV, 207, AT, IX2, p. 325.

³Discourse, IV, AT, VI, pp. 31-35; Meditations, I III, AT, IX, p. 27; Rules, XII, AT, X, pp. 422-23; Replies, V, 2, 1, AT, VII, p. 352; cf. Alquié, Descartes, p. 118.

which he refers when he speaks of things which are known by the "natural light," also constitute a realm which is never doubted. As Descartes uses the term "common notions," these are like chains joining other simple natures together which are immediately recognized by us, or made manifest to us by the natural light. They function as very general axioms, when the Cartesian system is seen as a deductive schema. Since the common notions, for Descartes, are nothing apart from our thought, there is no way that we can be deceived about them. For better or for worse, Descartes is committed to the inclusion of the causal principle among these axioms or common notions.

(3) It is possible, however, to be deceived concerning the "eternal truths," which are listed in Principles, IV, 206. Descartes is quite explicit here concerning the kinds of truths which he admits to this rank, and about the sense in which God might deceive us concerning them. It includes (a) mathematical truths, in the sense that two and three "joined together" do equal five, and that squares do in fact have four sides; (b) the recognition that external bodies do in fact exist; and finally (c) some of the physical theorems of the Principles--including, we would assume, the revised laws of motion, which Le monde called "eternal truths." The hypotheses of Principles, III, 46, to which Descartes refers, are "that all the bodies which compose the universe

are made of the same matter, which is divisible in all sorts of particles, and is now divided in many particles which are variously moved, and of which the movements are, in some fashion, circular; and that there is always an equal quantity of these movements in the world . . ."⁴

We may have a "more than moral" certainty concerning the eternal truths, since they are guaranteed by God. They are true, as we have seen, in all possible worlds, and we cannot conceive of a world in which they are false. But we could be deceived concerning them, because they do depend upon a relationship between thought and object. A deceptive god could falsify this relationship.

(4) Moral or practical certainty is that which carries a high degree of probability. Descartes does not refer to this type of certainty as "probable," however. For him, "probable" means "dubious" and is a term of opprobrium.⁵ Nevertheless, it is convenient to see this

⁴Principles, III, 46, AT, IX2, p. 124.

⁵In the Rules, "Descartes had in mind a discreditable and even contemptuous meaning" for the word "probable." It ". . . had for Descartes no rudiment of the significance it has acquired through the theory of probability. It must be remembered that in Descartes' time the theory of probability was only just beginning to take shape through the work of Pascal and Fermat, and that to the works of both these mathematicians Descartes was not entirely sympathetic." S. M. Jacob, Notes on Descartes' Règles (London: International Book Club, 1948), p. 10, quoted in Descartes' Philosophical Writings, Norman Kemp Smith, ed. (New York: St. Martin's Press, 1952), p. 6. On Descartes' feud with Fermat and Pascal, cf. to Mydorge, Mar. 1, 1638, AT, II, pp. 1-23.

type of certainty as defining a realm of "highly probable" knowledge. We have to remember that Descartes, in the Principles, was skating on some very thin doctrinal ice. He has stated flatly that he believes the heliocentric hypothesis to be false, but that it is useful to employ it in explaining planetary motion. Similarly, he develops a kind of physical evolutionary theory, which is false by doctrinal standards, but useful in describing the present state of the world. The very peculiar status of these false-but-useful hypotheses reflects Descartes' belief that revealed truths take precedence over natural knowledge. But it also shows how very difficult it was to incorporate these revealed truths into his philosophical system.

In a sense, all four levels are "certain," in that Descartes believes that the evidence for them is adequate. But the third level depends upon the first and second levels, and the fourth level depends upon the first three levels, in the sense that we cannot be sure of the upper portions of our structure unless we are sure of the foundations. This is probably the meaning of Descartes' claim that the truth of the existence of God is more certain than the truth of geometry.

It is hard to imagine any characteristic of Descartes' physics that caused more trouble for his followers than the claim of infallibility for certain principles, including the laws of motion. It will be important for us to make sure that we understand him.

Among the critics, Huygens has stated one possible response very well:

M. Descartes has found the way to have his conjectures and fictions taken for truths. And something happens to those who read his Principles of Philosophy which is similar to what happens to those who read novels which are pleasing and which make the same impression as true histories. The novelty of the figures of his little particles and of the vortices are very much like them. It seemed to me when I read this book, the Principles, the first time, that everything went beautifully, and, I thought, whenever I found some difficulty there, that it was my fault, for not having understood his thought. . . . One understands what Mr. Descartes says, in contrast with what the other philosophers give us, words which do not make for understanding, like these qualities, substantial forms, intentional species, etc. He has rejected that impertinent rubbish more universally than anyone previously. But what has recommended his philosophy above all is that he has not stopped at provoking disgust for the old, but that he has tried to substitute causes which could be comprehended from all that there is in nature. . . . But in wishing to make it believed that he found the truth, as he wishes to do throughout, in relying upon and glorying in the succession and the beautiful interconnection of his expositions, he has done something which is highly prejudicial to the progress of philosophy. For those who believe him and who have become his sectarians imagine that they possess the knowledge of the causes of everything, insofar as it is possible to know them; thus they sometimes fail to retain the doctrine of their master, and do not study to penetrate the true reasons of the great number of natural phenomena of which Descartes has rattled off only chimeras.⁶

There is no doubt that there is a class of "eternal truths," proposed by Descartes as known infallibly through the chain of argument which shows that God cannot be a deceiver. If God had willed otherwise, a different set of

⁶Oeuvres de Chr. Huygens, X (1905), pp. 403-406, quoted in C. de Waard, "Petit contre le 'Discours' de Descartes," Revue de Métaphysique et de Morale, XXXII (1925), pp. 67-68.

eternal truths would hold. But God has decided that these truths--the theorems of mathematics and the laws of nature--are eternally true.

The criterion of truth, for the eternal truths, appears to be our inability to doubt them, or to conceive of their opposite. Thus, "No mountain without a valley" is an eternal truth, because we cannot conceive of a mountain without a valley. Again, "Two and three are five" is an eternal truth, because we cannot conceive of two "joined with" three not making five.⁷ Descartes uses the same criterion for certain rules of his physics. For example, his claim that there is no void depends on the inconceivability of a void. A void would be an extended unextended thing, and thus the concept of it is self-contradictory. Descartes claims that God does have the power to make an empty vase, with literally nothing inside it, but he also claims that we cannot conceive of such a vase. On the basis of this criterion, then, "There is no void" is an eternal truth.⁸

I think that Huygens was mistaken in his complaint about Descartes' system, although he may have been justi-

⁷Meditations, V, AT, IX, pp. 52-53; to Gibieuf, Jan. 19, 1642, AT, III, pp. 476-77; Notes, II, AT, VIII2, pp. 347-48, Replies, VI, AT, IX, p. 243.

⁸To Mersenne, Apr. 15, 1630, AT, I, p. 139; to Mersenne, Oct. 11, 1638, AT, II, pp. 382-399; to Mersenne, Jan. 9, 1639, AT, II, p. 482.

fied in complaining about some of Descartes' followers. I do not think that Descartes was quite ready to declare that his particle theory, or his vortex theory, were really eternal truths. Given that there is motion in the world, and given that there is no void, then something like vortices are required to explain how motion is possible. Again, given motion and the plenum, something like a theory of particles is required. Such proofs, however, depend on our empirical knowledge that there is motion in the world. Since motion is a clear and distinct idea or conception, we could accuse God of deceiving us if there were no motion, since our natural inclination to believe in it is overwhelming. Since God is not a deceiver, therefore motion exists (and Parmenides is wrong).⁹

But this does not yet constitute a proof of the existence of particles and vortices. We would have such a proof only if we could show that the only way in which motion could take place in a plenum would be through particles and vortices; and Descartes has not attempted this proof. Therefore, particles belong in the category of "moral" certainties, not "more than moral" certainties. They are not eternal truths.

The laws of motion of the Principles exclude action at a distance. The laws of motion are of some interest in

⁹Cf. Patrick Suppes, "Descartes and the problem of action at a distance," Journal of the History of Ideas, XV (1954), pp. 146-52.

their own right, and they illustrate what Descartes seems to have meant by "eternal truth."

Those of Le monde are considerably simpler than those of the Principles, and we may consider them first. The three laws are these:

The first is: That each particle of matter, in particular, continues always to be in the same state, as long as an encounter with others does not constrain it to change. That is: if it has some size, it will never become smaller, unless the others divide it; if it is round or square, it will never change that figure unless others constrain it to; if it is stopped in some place, it will never part from that place unless the others drive it out; and if it has once commenced to move, it will always continue with the same force until the others stop it or slow it down.¹⁰

I suppose for a second Rule: That, when a body pushes another, it would not be able to give it any movement, unless it lost, at the same time, an equal quantity of its own movement; nor take any motion away from it, unless its own movement is equally augmented. This Rule, joined with the preceding rule, accords very well with every experiment, in which we see that a body begins or ceases to move, because it is pushed or stopped by some other.¹¹

I will add for the third: That when a body moves, even though its movement is made usually in a curved line and even though it is never able to make any movement, which is not in some fashion circular, as has been said above, nevertheless each of its particles, in particular, tends always to continue its movement in a straight line. And thus their action, that is the inclination that they have to move, is different from their movement.¹²

Although the second rule makes reference to experiments, the passages that precede and follow the rules make it clear that Descartes regards them as necessary

¹⁰Le monde, VII, AT, XI, p. 38.

¹¹Le monde, VII, AT, XI, p. 41.

¹²Le monde, VII, AT, XI, pp. 43-44.

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In their form, these rules seem closely to resemble the "common notions" that Descartes uses as the basis for his metaphysics. They seem almost to be the translation into physical terms of the rule that "nothing comes from nothing." In particular, the first rule asserts that no change in size, shape, or location can come from nothing. The second rule claims that no change in the quantity of motion can come from nothing. And the third rule asserts that no change in the direction of motion can come from nothing. It was the audacious project of the young Descartes, which was not abandoned in the Principles, to explain all physics on the basis of rules like these, which seemed to him to be indubitable.

There is no question of the status of these rules for Descartes. They are written upon the mind by God. God guarantees their truth. As he says in the Principles, God would have to be a deceiver if they were not true.

This way of stating the rules, however, leads almost immediately to a number of rather difficult questions. While Plato posited a previous existence, from which forms or ideas might be remembered, Descartes does not even discuss this possibility. To be sure, the language that he uses often suggests that we remember the innate ideas. Recognizing them, for example, is compared

with the manner in which we remember the face of a person, when we look at a sketch of him. In the same way, we seem to remember the triangle when we look at an imperfect representation of it. But memory here is always a metaphor, just as the wax is a metaphor for the mind. The metaphors of L'homme are perhaps the most successful: memory is like a cloth or a piece of paper which has been repeatedly folded. Although no apparent trace remains on its surface, it will fold much more readily along the previous crease than along some other line. Just as this crease is potentially in the paper, so the triangle is potentially in the mind.¹³

Although I do not want to reject the doctrine of innate ideas out of hand, it does seem to me that we can reformulate the doctrine of the eternal truths in such a way that we do not need to rely on a process which is really rather mysterious.

Huygens' comments are relevant here. Descartes is contrasted with philosophers whose words "do not make for understanding, like these qualities, substantial forms, intentional species, etc." For these occult entities, Descartes substitutes a uniform matter, divided or divisible into tiny particles, which are in a kind of circular motion in a plenum. The laws of motion are such that the

¹³L'homme, AT, XI, p. 178.

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behavior of the particles can be fully described in terms of mathematics and geometry.

Against this background, I think that we can say that what Descartes is doing is simply stating what it means to "understand" a physical phenomenon, and what an "explanation" of a physical occurrence would consist of. A reference to "substantial forms" is not an explanation, because we do not understand what these words mean. A reference to collisions between particles, on the other hand, can be fully described in mathematical terms, and it is therefore an explanation. It is something that we understand. Descartes is giving, then, a precise explanation of what he means by "explanation."

He believes, moreover, that others will agree. Not, perhaps, with his decision to exclude real properties, substantial forms, and the rest, but with his positive decision to include references to size, shape, and motion. All persons can attain to a clear and distinct idea of these at least.

I think that this must be the meaning of the following passage in the Principles, IV, 200: "That this treatise also contains no principles which have not been received at all times by everyone, so that this philosophy is not new, but the most ancient and the most common which could be." The common notions to which he has appealed, and the eternal truths which he has announced, then, are not controversial.

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A contemporary logician might be expected to give proofs of completeness and consistency when he has proposed a set of axioms for a system. Descartes does claim completeness for the eternal truths of Le monde, and he gives a proof of completeness in the Principles.¹⁴ In neither work, however, does he attempt to show consistency, and I think that it is this omission which has caused trouble, rather than the system's a priori character. If the eternal truths are inconsistent, then there is no unique way of explaining a given event. If we are permitted to identify the form of explanation with the form of prediction, then we can state the trouble more precisely. Given an inconsistent system of physical laws, we can make an indefinitely large number of inconsistent predictions, based on the same set of data. And this seems an undesirable characteristic for our laws to have.

To show this, we must first sketch the laws of motion for the Principles. Part II, sections 37 to 42, contain a restatement of the rules of Le monde. The proof here is explicitly metaphysical:

God is the first cause of movement, and . . . he always conserves an equal quantity of it in the universe. . . . From the fact that God is not subject to change, and that he always acts in the same way, we are able to arrive at the recognition of certain rules, which I call laws of nature, and which are the secondary causes of various movements

¹⁴Le monde, VII, AT, XI, p. 38; Principles, IV, 199, AT, IX2, pp. 317-18.

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which we notice in all bodies, which makes them quite worthy of consideration here.¹⁵

In the Principles, Descartes also makes explicit the rejection of Aristotelian doctrines of natural place and projectile motion:

We see, every day, the proof of this first rule in the things which have been pushed a certain distance. For there is no other reason why they continue to be moved, when they are out of the hand of the person who has pushed them, if not that, following the laws of nature, all the bodies which are moved continue to move until their movement is arrested by some other bodies. . . .¹⁶

The three "laws of nature," as stated in the Principles, are these: (1) "That each thing remains in the state that it is, as long as nothing changes it."¹⁷ (2) "That every body which is moved, tends to continue its movement in a straight line."¹⁸ (3) "That, if a body

¹⁶Principles, II, 38, AT, IX2, p. 85. Cf. Norwood Russell Hanson, "Aristotle (and others) on motion through air," Review of Metaphysics, XIX (1965), pp. 133-47. Hanson argues that experimental evidence does show some of the antiperistatic effects (i.e. the effect of a push from the displaced air) that Aristotle predicted. Descartes might have incorporated this antiperistatic effect within his theory of vortices, but he does not do so. He regards the effect of air wholly as a retardation of the projectile. To Mersenne, Dec. 18, 1629, AT, I, p. 92; to Mersenne, Feb. 25, 1630, AT, I, p. 117. (But it might, he says, assist the motion of a vibrating string. To Mersenne, Nov. 13, 1629, AT, I, p. 74.)

¹⁷Principles, II, 37, AT, IX2, p. 84. The Latin version has: ". . . that each thing as far as in it lies, continues always in the same state; and that which is once moved always continues so to move." HR, I, p. 267; AT, VIII, p. 62.

¹⁸Principles, II, 39, AT, IX2, p. 85. The Latin has: ". . . that all motion is of itself in a straight line; and thus things which move in a circle always tend

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which is moved encounters another body which is stronger than itself, it does not lose any of its movement, and if it encounters another which is weaker which it can move, it loses as much of it as it gives to the other body."¹⁹

This rule was perhaps better stated in the form it took in Le monde. There, there was no reference to immovable objects. Here, in the Principles, we have a rule which seems to cohere badly with Descartes' belief that the cumulative effects of small particles may be sufficient to move some larger body, even though their individual effects are indiscernible.²⁰

An even more important element in these rules, which I will only mention here, is the reference to "tending." The term "to tend" appears repeatedly through Descartes' physical writings, and I think that a clear analysis of this term would be of the greatest importance for an understanding of his physics. It seems to me to represent his attempt to escape from the language of occult, anthropomorphic forces in nature, to a more nearly behaviorist language. Where his predecessors had spoken of nature "abhorring a vacuum," Descartes refuses

to recede from the center of the circle that they describe." HR, I, p. 267; AT, VIII, p. 63.

¹⁹Principles, II, 40, AT, IX2, p. 86; AT, VIII, p. 65. The Latin is similar.

²⁰Principles, IV, 201, AT, IX2, pp. 319-20.

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to permit the application of such a quasi-mentalistic term to physical objects. Similarly for gravity, force, potency, and a number of other concepts. When we speak of a particle as "tending," however, we mean (at least officially and for the most part) that the particle can actually be observed to move, given that certain other conditions hold. If Descartes can accomplish the reduction of all previous "occult" forces to a few simple terms like "tending," he will have accomplished a major reduction in the number of entities to which he is committed. It seems to me that this is the motive behind his use of the term "tending," although a full analysis would also show that he sometimes slips into a more-or-less anthropomorphic use of the term at times (making it equivalent to saying, "This particle wants to go that way, but it can't.")

In the present context, the use of "tending" in the second rule serves to reinforce the interpretation that I have suggested for the "eternal truths," of which the laws of motion are examples. I have said that the functions of these rules is to give an explanation of explanation. They tell us what will serve to explain a given phenomenon, so that we will understand it. What Descartes claims is this: that as long as a particle continue to move uniformly in a straight line, no further explanation of its motion will be required. When it no

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longer moves in this manner, then we must explain the change. We explain it by reference to other particles which have collided with it. This is what we mean by "explanation."

When we say that a particle "tends" to move in a certain direction at a certain velocity, then no further explanation of its behavior is required, if it actually does move in that direction at that velocity. Such a description may be contrasted with the Aristotelian description in terms of "natural place." In the Aristotelian system, fire and air would "tend" to move upward, and earth and water would "tend" to move downward. We would not have to explain why a given piece of earth moved downward. Explanation is required only when it moves in some other direction. Similarly, in the Aristotelian system, moving objects tend to come to a halt. If a projectile slows down and stops, then this requires no explanation. If it continues to move, however, then we must offer an explanation of why it continues to move.

We may understand the other rules similarly. For Descartes, the first law of nature says that, on the level of secondary causes, with which physics is concerned, we cannot meaningfully ask why a square or a triangle remains unchanged from moment to moment. Of course, at the metaphysical level, we must refer to the primary cause: It remains unchanged because God wills it. But for physics, it is changes in size and shape that must be explained.

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Again, for the third law of nature (particularly in the more satisfactory form in which it appears in Le monde), we regard the behavior of two colliding bodies as fully explained if it accords with the movement which the law predicts. Failure to obey this law means that further explanation is required. For example, when we find that magnets seem to fail to obey this law, we must give a further explanation, perhaps in terms of invisible, small, screw-like particles, flying at great speed through threaded pores in the magnets.

As they are stated, however, the laws are appallingly vague. We will probably have to allow a number of undefined terms, like "same state" and "straight line." But the "quantity of motion" in the third rule of the Principles must be given some sort of definition. When, for example, we see a bushel of feathers colliding with a cannon ball, which has the greater quantity of motion?

In order to provide us with a method by which we can deduce individual motions, Descartes gives seven "rules" in the Principles, which immediately follow and explicate the "laws of nature."

The rules may be summarized very briefly as follows:

(1) If two equal bodies approach each other along a straight line at equal speeds, they will rebound, when

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they collide, along the same line at the same speeds but in opposite directions.²¹

(2) If two unequal bodies approach each other along a straight line at equal speeds, the small body will reverse its direction when they collide, and both will continue to move in the direction in which the larger was originally moving.²²

(3) If two equal bodies approach each other along a straight line at unequal speeds, they will rebound when they collide along the same line in opposite directions at equal speeds. The speed of each body will be the average of their previous speeds.²³

(4) If one body moves toward another body, which is larger and at rest, the smaller body will not be able to move the larger body, but will rebound in the direction from which it came. (In the French version, this rule has a number of idealizing restrictions upon the meaning of "at rest," together with an attempt to justify it.)²⁴

(5) If one body moves toward another body, which is smaller and at rest, then after colliding both will move at equal speeds in the direction of the original

²¹Principles, II, 46, AT, IX2, p. 89.

²²Principles, II, 47, AT, IX2, p. 90.

²³Principles, II, 48, AT, IX2, p. 90.

²⁴Principles, II, 49, AT, IX2, pp. 90-91; cf. to Clerselier, Feb. 17, 1645, AT, IV, pp. 183-88.

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(6) If one body moves toward another body, which is equal to it and at rest, it will rebound with $3/4$ of its original speed in the opposite direction, while the other will move with $1/4$ of the original speed of the first, in the same direction.²⁶

(7) The seventh rule concerns bodies which are moving in the same direction along the same line at unequal speeds, so that the second overtakes the first. Depending upon their proportionate sizes and speeds, the second will either rebound from the first without affecting its speed, or the two will continue together at the same speed.²⁷

The statement of the seven rules concludes with these words: "And the demonstrations of all these are so certain, that even though we might seem to see the contrary in experience, we would nevertheless be obliged to place more faith in our reason than in our senses."²⁸

²⁵Principles, II, 50, AT, IX2, pp. 91-92.

²⁶Principles, II, 51, AT, IX2, p. 92.

²⁷Principles, II, 52, AT, IX2, pp. 92-93.

²⁸Principles, II, 52, AT, IX2, p. 93.

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Although the seven rules doubtless show Descartes' a priori physics at its very worst, this last observation, however arrogantly rational it may seem, is of the greatest importance in understanding the status of these rules for Descartes. And however little faith we may place in the rules themselves, I am not sure that we will want to reject the method out of hand.

First, there is no attempt at an appeal to experience. In every instance, the appeal seems rather to be to what we can conceive in the transfer of motion from one object to another. Apparently, then, it is an explication of what we mean by "efficient causality" when we are restricted to impact as the only mode in which it is expressed.

Consider the first rule. I find that it is the only one that, for me, has any intuitive plausibility. But if we can concentrate on this rule alone, we see the sort of situation that Descartes thinks of in connection with all seven rules. Suppose that two billiard balls, on a table, are rolled toward one another along a line at about the same speed. Suppose, then, that immediately upon impact, both balls bounce back in the direction from which they have come. There is, we would feel, no need of any additional explanation.

Consider, then, a situation in which two apparently identical balls roll toward one another on a billiard table. They touch one another, and one of them goes

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whizzing off in another direction, while the other stops still, on the spot. On the face of it, we would not understand this situation. We would begin to look for magnets, to inspect the balls for hidden weights, check the table with a level, and so on. We would expect to find something else which, combined with the information we have, would provide an explanation of the event. Until we found it, we would say that we did not understand the event.

This, I think, is what Descartes is claiming, in his last paragraph. He is saying that his laws are infallible, but the really significant claim is that laws like these will determine what will count as an explanation. They define, in precise and explicit terms, what it means to say that we understand an event, and when a purported explanation really is an explanation. We have explained an event when we have fitted it into one of these laws. If we find an event in nature which appears to violate these laws, then we simply haven't found out the whole story about the event. The rules tell us that there is something more for us to look for. In other words, if an observed event appears to violate the rules, then we do not understand that event.

In no sense, then, do the rules claim to be empirical generalizations about the behavior of particles in the real world. They function rather as definitions, telling us what counts as an explanation.

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The rules, of course, are seriously wrong in detail. It is a little strange to see Descartes expressing them in non-mathematical form, particularly because their incoherence becomes apparent when they are expressed as mathematical formulas.

Consider the first two rules together. The first deals with equal bodies, the second with unequal bodies. It would be intuitively plausible to make the first rule a special case of the second, in such a way that, when two particles are very nearly equal, their resulting behavior is very like that of equal bodies, and the more nearly alike the bodies, the more similar their behavior. But this is not at all what happens. No matter how nearly alike the particles, by the second rule only the smaller will reverse its direction when they collide. By the first rule, both will reverse their directions.²⁹

Paul Tannery has given formulas for the various rules and has shown that the two cases of the seventh rule can give contradictory results. Specifically, if the ratio of the masses of the two bodies is equal to the inverse of the ratios of their velocities, either of the

²⁹Cf. Nicholas Rescher, The Philosophy of Leibniz (Englewood Cliffs, N. J.: Prentice-Hall, 1967), pp. 51-52, for Leibniz' version of this criticism.

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formulas of the seventh rule may be applied, with different predicted outcomes.³⁰ Similar examples of incoherence can be given for all the rules.

It is important, however, not to underestimate the task which Descartes is undertaking here. Thomas Kuhn gives an evaluation of it which seems properly judicious:

It is, today, childishly easy to discover errors and inadequacies in Descartes's discussion of vortex cosmology and in the astronomy, optics, chemistry, physiology, geology, and dynamics that he derived from it. His vision was inspired, and its scope was tremendous, but the amount of critical thinking devoted to any one of its parts was negligibly small. His laws of corpuscular collision provide but one of countless examples. But in the development of seventeenth-century science, the parts of Descartes's system were far less important than the whole. Descartes's brilliant successors, led by Christian Huygens, found their inspiration in his underlying conception, rather than in its detailed development. They could and did change his laws of collision, his description of vortices, and his laws for the propagation of light. But they did not compromise his conception of the universe as a corpuscular machine governed by a few specified corpuscular laws.³¹

We have seen three natural laws, which appear in somewhat different forms in Le monde and the Latin and French versions of the Principles. We have also looked at the seven laws of motion of the Principles. From the historical point of view, we can probably accept Kuhn's evaluation of them (which does not seem far different from that of Huygens). The seven rules of motion are mostly

³⁰Paul Tannery, "Sur les règles du choc des corps d'après Descartes," AT, IX2, pp. 327-30.

³¹Thomas S. Kuhn, The Copernician revolution (New York: Vintage Books, 1959), p. 242.

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wrong, but the underlying conception has been tremendously fruitful. Our purpose here, however, is to ask a rather different question. What role do the three laws and the seven rules play in the structure of Descartes' own system? At what level did Descartes ascribe certainty or truth to them?

As a first approximation, it seems quite unlikely that Descartes regards everything as equally certain. On the one hand, the three laws of nature are described in Le monde as "eternal truths" which would hold in all possible worlds. They are derived from the constancy of God. It is probably significant that the laws are not much changed from the time of their first appearance to their last. This would seem to indicate that Descartes was quite sure of his ground here.

On the other hand, the seven rules of motion of the Principles do not seem to have the same degree of certainty behind them. Although Descartes never seems to have been willing to admit that anything which he has published has been mistaken, the seven rules were very extensively revised for the French edition.³²

I think that we can say, then, that the seven rules of motion are not more certain than the three laws

³²Descartes tells Burman that many complained of the obscurity of these laws, and that he has "clarified and explicated them a little" in the French edition. Burman, AT, V, p. 168.

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We can also establish bounds upon the certainty of the rules and laws. Since the laws, in both Le monde and the Principles, are derived from God's constancy, our knowledge of the laws and the rules cannot be more certain than is our knowledge that God exists, that he is constant, and that he is not a deceiver. Thus we have an upper bound on the certainty of these laws.³³

We also have a lower bound. The rules of motion are held, explicitly, to be more certain than any experiments or experiences. Whenever we encounter, in experience, an apparent contradiction to the rules of motion, we are to assume that we are misjudging the nature of the event. That is, we do not have all the data (we are to assume), and we have to look for further evidence. Since sense experience is never adequate, we can never complete the process of looking for further evidence, and thus sense experience can never invalidate the rules.

I think that we will find it hard to disagree, in principle, with Descartes at this point. Suppose that I were given, for example, a set of surveyor's instruments

³³"One will better recognize the truth of the other part of this [third] rule, if one notes that God does not ever change the fashion by which he acts, and that he conserves the world with the same action by which he has created it. . . . that continual changing in the creatures in no way contradicts the immutability which is

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and asked to survey a large triangular plot of ground. Suppose that I measure the triangle and find it to be a right triangle, but that the sum of the squares of its sides does not equal the square of the hypotenuse. If I then claimed that I had disproved the Pythagorean theorem, it would only be because I was trying to make a joke. The only proper response would be either that the instruments were faulty or, what is more likely, that I didn't know how to use them correctly.

In our use of empirical instruments, like surveyor's tools, we presuppose a number of things. Certainly we assume the geometrical and arithmetic rules. We assume a number of optical and mechanical laws, governing the instruments. We make a number of stipulations. For example, we say that the line of sight is to be regarded as a Euclidean straight line (and we would make different stipulations if we were astronomers or quantum physicists). We agree to tolerate a maximum error of some stated amount. And so on. There are probably rather a large number of presuppositions required even for so apparently simple a task as surveying a plot of ground.

The laws of nature and the rules of motion of Descartes might belong to various classes. They might be regarded as wholly on a par with the theorems of mathe-

in God, and even seems to serve as an argument to prove it." Principles, II, 42, AT, IX2, pp. 87-88.

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matics. They might be empirical laws. They might be stipulations. Or they might be pragmatic rules of thumb, like the moral precepts of the Discourse, to serve as interim guides until something better is found.

Although a good deal of Descartes' discussion makes it appear that he wants the laws and the rules to be equivalent in stature to the mathematical truths, his actual statement at the end of the Principles is vague. "More than moral" certainly is claimed for mathematics and for equally evident and certain principles, "among which it seems to me that those that I have written in this treatise ought to be received, at least the principal and most general ones."³⁴ I think that this last phrase divides the laws of nature from the rules of motion.

We can regard Descartes as saying something like this: When I say that God is constant and unchanging, what I mean is that every particle remains in the same state until acted upon by some other particle, and so on. We know, by another line of argument, that the laws of mathematics are true, in that they can be truly applied to nature. The proof of the Meditations showed that God is not a deceiver. Therefore, all that I conceive clearly and distinctly is true. I conceive mathematical theorems clearly and distinctly. Therefore, mathematics is true,

³⁴Principles, IV, 206, AT, IX2, p. 324.

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The Principles attempt to provide an answer to this question. That is, Descartes tries not only to show that geometry and algebra can be applied to nature, but also to show specifically how they are to be applied. But he does not show that this is the only possible way in which mathematics might be applied to nature, and it is difficult to imagine how he would prove such a claim. The metaphysical proofs, which have the certainty of eternal truths, have shown that mathematics can be applied to nature, in some fashion or other. It is conceivable that they could be applied in some very different way.

The seven rules of motion, then, appear to be established at a different level of certainty from that of the eternal truths. I want to discuss this level of certainty, which applies to rather a large cluster of rules and principles in Descartes' writings, in the next chapter, where we will find that they can be called "moral certainties" or "probable truths."

The three laws of nature, however, appear to have a stronger claim to certainty. Descartes' early reference to them as "eternal truths," his derivation of them from the nature of God, and his claim that they hold in all possible worlds--these are claims which he never makes for the seven rules of motion. The laws, then, seem to

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We should attempt to meet the objection that a disciple of Karl Popper might make. If neither the laws of nature nor the rules of motion can be contradicted by any experience that we might have, then does Descartes have any right to call his system "scientific"?³⁶ What--such a critic might ask--is the point of scientific experiment at all, if we can know, in advance of any experience, what the outcome must be?

The manner in which Descartes has stated his laws and rules seems to leave him open to the objection that, in the language of one contemporary theory, the "information content" of his laws is zero.

The force of this objection is, I think, greatly reduced, if we regard his system as operating on at least three levels.

(1) At the level of certainty which applies to the "eternal truths" of mathematics, there is "more than moral certainty" that might be expressed as follows: The laws of physics take the form of mathematical equations.

³⁵Cf. Discourse, V, AT, VI, pp. 41-43.

³⁶" . . . I shall certainly admit a system as empirical or scientific only if it is capable of being tested by experience. These considerations suggest that not the verifiability but the falsifiability of a system is to be taken as a criterion of demarcation." Karl Popper, The logic of scientific discovery (New York: Basic Books, 1959), p. 40.

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(2) At quite another level of certainty, "moral certainty," the claim is this: The laws of motion in physics will take the form of just these mathematical equations--the eight equations for the seven laws of motion, as Tannery reconstructs them from the Principles.

(3) Finally, on the basis of observations, we will say: The laws of physics are these mathematical equations with just these parameters. The parameters are subject to correction and revision as more accurate measures are found, e.g. of the index of refraction of a type of glass, or the position of a certain planet.

We might hope to show, eventually, a completely deductive proof of all laws of physics from the laws of motion, and ultimately from the metaphysical basis of the system. In the real world, however, we have to rely on what d'Ailly called "natural reason." And Descartes repeatedly insisted that science could not be produced "like Pallas from the head of Zeus," from the mind of the scientist sitting in an armchair. Experiments, Descartes insists repeatedly, must be carried out if we are to have a science.³⁷

³⁷Discourse, VI, AT, VI, pp. 64-65; to Mersenne, Apr. 5, 1632, AT, I, p. 243; to Mersenne, Apr. 10, 1632, AT, I, pp. 250-51; Rules, V, AT, X, p. 380; Rules, II, AT, X, pp. 364-65, Meteorology, I, AT, VI, pp. 334-45; to Plémpius, Oct. 3, 1637, AT, I, p. 421; Principles, IV, 27, AT, IX2, p. 214; to Mersenne, Nov., 1633, AT, I, p. 271.

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Consider an Aristotelian, a Newtonian, and a Cartesian, each of whom is called upon to "explain" the path of a projectile. The Aristotelian will, I think, describe the event in largely qualitative terms, referring to the four "causes" which enter into the event. The Aristotelian does not know in advance just what the four causes of an event will be, but he knows that they are there. His physics has told him that a projectile, which is made of earth, will naturally travel downward, while the horizontal velocity will naturally decrease through time. It is not necessary for him, therefore, to explain the downward motion, or the natural retardation of the projectile. What he does have to explain is its inertial motion, that is, the fact that it does continue to move after the initial impetus.

The Cartesian knows, in advance, that the motion of the projectile can be described in terms of mathematical functions, and that the efficient cause is all that is required in an explanation. He knows that the rules of motion will apply. In describing the projectile, he need not explain the continuing motion of the object. What he must explain is its gradual deceleration and its fall toward the ground. The theories of particles and of vortices will be required for a full explanation.

Finally, the Newtonian will approach the problem with some of the same assumptions as the Cartesian, but he will also feel free to refer to "gravity" as a describ-

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able and quantifiable force, which need not itself be explained. The Cartesian regards "gravity" as occult.³⁸

It is very difficult to imagine empirical grounds on which a choice could be made among these explanations. Given sufficient time and ingenuity, and given access to an unlimited number of supplementary hypotheses, each of them could explain all the data that are available to them. To be sure, the Cartesian system requires the unlikely presence of large numbers of invisible particles moving very rapidly in vortices, if it is to explain gravity or magnetic attraction. This was the price that it paid for the greater simplicity that came with rejecting gravitation and magnetism. But Cartesianism, like Aristotelianism, is rejected as a system only because it is clumsy, not because it is somehow disproved by experiment.

In saying that his laws of physics are "eternal truths," then, Descartes is saying that the laws of nature are willed by God, and that we recognize these laws, passively, when we "see" them clearly. They are innate, in the sense that we have the power to recognize them. But our recognition of them is somewhat like choosing, in that some mathematical theorems seem true to us, while others do not. Some theories seem more elegant to us than others. There is a certain sense of "fitness" about them.

³⁸Cf. Replies, VI, 10, AT, IX, pp. 240-41.

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Those who do not hold to a theory of innate ideas would perhaps regard the selection of a system as arbitrary. To say this, however, is not to say that it is unmotivated. The Cartesian system is motivated by Descartes' development of a powerful and elegant method for dealing with geometrical figures. In contrast, there was no effective method for quantifying temperatures, colors, or other "confused" conceptions.³⁹

³⁹Galileo's "thermoscope" of 1595 was not accurate. An accurate alcohol thermometer was not available until 1641, after the Cartesian system was pretty much complete. His problems in reconciling his often-repeated claim that there can be no vacuum, with the contemporaneous development of the barometer, suggest strongly the dependence of Cartesianism on a specific stage of the development of technology. It was difficult for him to explain the barometer without abandoning his claim that there can be no vacuum, and to do so would have meant very nearly to abandon his whole physics. Nevertheless he was able to put together an explanation. Cf. to Mersenne, Dec. 13, 1647, AT, V, pp. 99-100.

On Descartes' mathematics as motivation for his metaphysics, cf. E. A. Burtt, The metaphysical foundations of modern science (Garden City, N. Y.: Doubleday Anchor Books, 1954), pp. 105-124.

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CHAPTER XII

MORAL CERTAINTY

In turning to the "moral certainties," I want first briefly to mention Descartes' treatment of empirical knowledge in the Principles. Descartes, as we have seen, certainly did not hold to a kind of armchair approach to physics. Although the experimental basis for the Principles is extremely weak, it is weak, I think, primarily because Descartes could not carry through the experimental program that he set forth in the sixth section of the Discourse, which called for a cooperative attack on medical problems and scientific problems generally.¹

In the last section of the Discourse, Descartes shows the relationships that he finds among the various levels of knowledge:

First, I have tried to find, in general, the principles, or first causes, of everything that is, or which could be, in the world, without considering

¹Discourse, VI, AT, VI, p. 63. Petit, in his ill-tempered attack on the Discourse, which certainly merited Descartes' contempt, calls attention to the contrast between the initial claim that the structure should be designed by one man, and the request in the final section for a cooperative effort. Petit seems correct in finding something like a contradiction between these two aims. Compare AT, VI, p. 63, with AT, VI, p. 72. De Waard, "Petit contre le 'Discours' de Descartes," pp. 88-89.

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anything for this purpose other than God alone, who has created it, nor deriving them elsewhere than from certain seeds of truth which are naturally in our souls. After that, I examined what were the first and most ordinary effects which could be deduced from these causes: and it seems to me that, in this way, I found the heavens, the stars, an earth, and even, on the earth, water, air, fire, minerals, and some other such things which are most common of all, and the most simple, and, as a consequence, are the easiest to recognize. Then, since I wanted to descend to those which are more particular, there are so many diverse things which were presented to me, that I did not believe that it might be possible for the human mind to distinguish the forms or species of bodies which are on the earth from an infinity of others which could be there, if it had been the will of God to put them there, nor, as a consequence, to show how to make use of them, if it is not by going from the causes to the effects, and making use of many particular experiments. Following this, passing my mind again over all the objects which were ever presented to my senses, I may well dare say that I have not noticed anything there which I might not explain quite easily by the principles that I have found. But it is necessary also that I admit that the power of nature is so ample and so vast, and that these principles are so simple and so general, that I notice almost no particular effect about which I did not recognize at first that it could be deduced from them in many different ways, and that my greatest difficulty is ordinarily to find in which of these ways it depends upon them. Thus, for that purpose, I do not know any other expedient, except to seek anew some experiments which are such that, if their outcome is not the same, whether it is in one of the ways that it ought to be explained, or whether it is in the other way.²

Given, then, two alternative means of "deducing" a given event from its possible causes, and given the finitude of the human mind, our only recourse may be to conduct a crucial experiment, such that its outcome will eliminate one or more of the competing hypotheses.

²Discourse, VI, AT, VI, pp. 63-65.

In this passage, and elsewhere in his early writings, Descartes refers to innate ideas as "seeds of truth," which I take to be an uncritical use of the Stoic notion of λόγοι σπέρματικοί. The true and immutable natures, which form the concepts of the triangle, of God, and of the eternal truths, exist as potentialities or "seeds" of truths, which may be nurtured and developed, and, presumably, be recognized as true.³

Below the level of the eternal truths are the laws of nature, like the rules of motion of the Principles. Finally, there are the special laws and rules. Ideally, these last might be deduced from the nature of God. But for finite human beings, the only recourse is to experiments.

The need for empirical determination of the laws of nature is reemphasized in the Principles:

We have remarked above that all the bodies which compose the universe are made of the same matter, which is divisible into all sorts of particles, and which is already divided in many particles which are variously moved; and that their movements are somehow circular, and that there is always an equal quantity of these movements in the world: but we cannot determine in the same way how large the particles are, into which matter is divided, nor what is the speed with which they are moved, nor what circles

³Rules, IV, AT, X, p. 376. A passage in the Cogitationes privatae, AT, X, p. 217, compares such truths also to the sparks in a flint: ". . . the philosophers extract them by reason; the poets tear them out by imagination: they burn all the more brightly." Descartes' preference for the poet may be puzzling to those who regard him as the quintessence of rationalism.

are described. For God might have ordered them in an infinity of different ways, so that it is only by experience, and not by the force of reasoning, that one can know which of all these ways he has chosen. That is why we are free to suppose whatever we wish, provided that all the things which are deduced from such suppositions accord entirely with experience.

Let us suppose, then, if you wish, that in the beginning God divided all the matter from which he made this visible world into particles which were as nearly equal as they could be among themselves, and of which the size was average, that is, a mean between all the various sizes of those which now compose the Heavens and the Stars; and finally, that he caused them all to be moved with equal force in two different ways, namely each one separately about its own center, by means of which they composed a liquid body, such as I judge the sky to be; and at the same time, many together about several centers, distributed in the same way in the universe, which we see at present as the centers of the fixed Stars, but of which the number was greater, in that it was equal to that of the Stars, Planets, and Comets taken together; and that the speed with which they are thus moved is an average, that is, that God has placed in them as much movement as there is of it at the present time in the world. . . .⁴

In this passage we notice particularly the language which calls for an explicit choice among hypotheses of origin: ". . . we are free now to suppose whatever we will wish . . ." Again, the language is one in which the role of experience is to confirm the choice of parameters for equations which have been previously determined. We must determine the size of the particles, the speed with which they move, and the size and form of the vortices in which they move. The order in which we determine these is somewhat peculiar and needs to be emphasized. We know in

⁴Principles, III, 46, AT, IX2, pp. 124-25.

advance that matter is uniform, that it is divisible, that it is divided and moving, that these movements are circular, and that the quantity of motion is constant. But we do not have, in advance, all the information that we need. They are "gaps" in our knowledge. We must choose among possible hypotheses. We choose to suppose that the particles are of a certain size at the beginning, and that they are distributed in a particular pattern of vortices, which is like the pattern which we observe at present. This is an important change from the viewpoint of the Meditations, although it appears to be consistent with that of the Discourse. In the Meditations we were specifically instructed not to use the will to make a choice when some data were lacking. The difference, however, is only apparent. When we choose values for the unknown quantities, we take them only as hypotheses. We try them out, to see what happens. If they accurately predict the observed outcome, then it is more likely that they are true, than if they fail to predict it.

This gives rather an idealized picture of the procedure that Descartes actually uses. Although he may speak of "deducing" effects from their causes, I have not been able to find anything corresponding to a mathematical deduction. Instead, we find largely qualitative descriptions, and a rather free use of ad hoc hypotheses when experience appears to contradict the theory. Perhaps the best way to regard the physical theories is as a system of

hypothetical constructs, which Descartes believes to have great explanatory value. And the tour de force that he attempts, in his explanation of the magnet, even has a kind of magnificence about it.

Descartes explains thirty-four major properties of the magnet through the use of two constructs: particles which are threaded, like tiny screws, and which fit into threaded pores running through the earth, through load-stones, and through iron and steel; and the principle of vortical movement. The "Explication of the nature of the magnet" runs through fifty section of Part IV of the Principles (133-183) and comes as a climax and crucial test for his whole system. Given the tools which he permitted himself to use--a reduction of all properties to those of shape, size and motion--it is difficult to image a better derivation of the properties of the magnet. It was only through the introduction of an "occult" entity, the magnetic field, which did not need to be explained further, tht the Newtonians achieved a simpler "explication." What is important to notice is that there is no disagreement between the Cartesians and the Newtonians concerning the observable properties of the magnet. The choice between the two is to be made on grounds which are not empirical.

Although Descartes insists upon the need for empirical confirmation of his hypothetical constructs, he seems, like all of us, to have been extraordinarily unwilling to

give up a doctrine, even one which was supposed to be subject to empirical test, in the face of overwhelming contradictory evidence.

Probably the outstanding example of this turn of mind in Descartes is his insistence, over against Harvey, that the heart is not an active organ, but a passive machine, somewhat like a coffee percolator. According to Descartes, the heart is heated by a "fire without light" and is controlled by valves in such a way that the blood enters drop by drop. Immediately turned to steam, the blood is cooled and condensed in the lungs, with the steam pressure forcing the reliquified blood through the arteries, and eventually back through the veins and into the heart.⁵

⁵L'homme, AT, XI, pp. 123-125; Discourse, V, AT, VI, pp. 46-48; Passions, I, p. 9.

We should remember that, at Descartes' time, the authority of Galen was still great, and the very doctrine of the blood's circulation was nearly as controversial, if not as criminal, as the doctrine that the earth moved. Michael Servetus had tentatively proposed a theory of the circulation of the blood in 1553 in his Christianismi restitutio, but that volume was so thoroughly suppressed on theological grounds that his medical theories had no effect. Cf. Earl Morse Wilbur, A History of Unitarianism (Cambridge: Harvard University Press, 1945), p. 147. William Harvey's Exercitatio anatomica de motu cordis et sanguinis in animalibus, published in 1628, was the first scientific treatise to show that the blood flows through the lungs and returns to the heart, against Galen's claim that it passes directly from the left ventricle to the right. In 1632 (Nov. or Dec.) Descartes wrote to Mersenne that he had seen Harvey's book, and that his own theories differed somewhat from those of Harvey. He also says that Le monde and L'homme are nearly complete. It is thus hard to say how much Descartes derived his theory from Harvey, but he gives Harvey credit for "breaking the ice." Discourse, V, AT, VI, p. 51.

The arguments against the percolator theory, if we may call it that, are quite overwhelming. Although the lack of an accurate thermometer made the measurement of exact temperatures difficult, it should have been obvious that the heart was not hot enough to vaporize the blood. In any case, cold-blooded animals, like fish, clearly did not have hot hearts, as correspondents pointed out to Descartes. Critics also pointed out that the pulse occurred at the wrong moment in time. Under Descartes' hypothesis, the pulse should have been simultaneous with the expansion of the heart, but it actually occurred when the heart contracted. Again, Plempius points out to him that portions of the hearts of animals continue to beat for a time after they have been removed from their bodies and actual circulation has stopped. Under Descartes' theory this would be impossible.

Descartes' reply to Plempius is most instructive, particularly since he was defending a hypothesis which is wholly false. First, he says that he himself repeated the experiment of removing the heart from the body of an animal. He found that the heart of a fish beats longer than that of some other animals (suggesting that he performed the experiment more than once, on different kinds of animals). But it is possible, he says, that the heart retained enough blood, and was hot enough, to explain the continued beating. Again, he says that he carried out the experiment by which the expansion and contraction of

the heart is co-ordinated with the beat of the pulse, and he finds that his own theory is confirmed. Finally, he asserts that he has found enough heat in the hearts of fish to vaporize the blood of those fish. Their blood, freshly removed from their veins, dilates instantly when it falls into a place which is just a little hotter than itself, "as on many occasions I have shown by experiment myself."⁶ Although we may wonder how in the world Descartes could have thought that he saw what he claims to have seen, there is not the slightest doubt that he regards experiment as providing a crucial test between his theory and that of Harvey.⁷

But this unwillingness to abandon a doctrine can only be regarded as a temperamental characteristic of the author and of his times, not as part of the Cartesian program. It is important to emphasize the role of exper-

⁶To Plempius, Feb. 12, 1638, AT, I, pp. 521-534; cf. to Plempius, Mar. 23, 1638, AT, II, pp. 62-69.

⁷Descartes' motive in rejecting Harvey's theory, on the other hand, seems to have been his belief that his whole system depended upon the passive role of the heart in circulation. When Mersenne calls his attention to some objections, which an Italian physician had raised, to his theory of circulation, Descartes replies: "Nevertheless I certainly hope that it will be thought that if what I wrote about that, or about refractions, or about any other subject to which I have devoted more than 3 lines in what I have had printed, is found false, then all the rest of my Philosophy is worthless." To Mersenne, Feb. 9, 1639, AT, II, p. 501. Given this kind of commitment to everything that he had had printed, it is scarcely surprising that he found it difficult to accept experimental invalidation of some of his theories.

iment for Descartes, because it is easy to assume that he thought that man really could do physics a priori.

The kind of certainty or confirmation which attaches to empirical judgments is quite different in the Discourse from what it is in the Principles. In the earlier work, it appears almost to reach a kind of more-than-moral certainty, on a level with the certainty of the rules of arithmetic.⁸ In the Principles, however, he claims only a high degree of probability for empirical judgments. Again, in the Discourse, he relies heavily on the method of enumeration which he had begun in the Rules. In the Principles, on the other hand, explanation is seen as a kind of cypher or cryptogram.⁹

We have, then, two rather different types of certainty to consider. One of these is the level of certainty which Descartes claims for empirical knowledge in the early works, based upon the method of enumeration. The other is the "moral certainty" of the Principles, which is a kind of highly probable knowledge based upon the metaphor of a cryptogram.

⁸Discourse, II, AT, VI, pp. 20-22.

⁹Principles, IV, pp. 204-205; Rules, V, AT, X, pp. 379-80.

CHAPTER XIII

THE METHOD OF ENUMERATION

The Rules distinguish problems which can be "sufficiently understood" from those which are "insufficiently understood." Those of the first kind, which turn out to be problems in arithmetic and geometry, are treated in Part II of the Rules. Part III, which was to contain a treatment of problems which are insufficiently understood, has never been found. The subject matter of Part II suggests that it has the level of certainty of the eternal truths of mathematics. Part III, then, might have had the level of certainty of the moral certainties, the empirical laws.

Both levels of certainty in the Rules require the concept of enumeration, which also plays a part in the Discourse. In the context of these two works, the first type of problem would be one for which the alternatives may be completely enumerated; the process of investigation is then one of elimination of the false alternatives, leading eventually to the discovery of the true one. For the second type of problem, this is not possible. There are missing data. Alternatives are not clear and distinct.

We do not have the information for determining which, of two alternatives, is correct. We must therefore rely upon our will, either to suspend judgment, or to make a selection without sufficient data.

Although the method of enumeration is mentioned in the Discourse, it receives much more adequate treatment in the Rules. The passage from the Rules which follows is of particular interest in that it provides a link between the method of enumeration in the early works and the cryptographic metaphor of the Principles. In the tenth Rule, Descartes says:

We have therefore pointed out that these things should be pursued with method, which, in these simpler matters, is usually nothing more than careful observation of the order which either exists in the object itself, or is cleverly devised by the intellect. Thus, if we wished to read a writing veiled in unknown characters, we would certainly perceive no order, but nevertheless we can imagine one, both for the purpose of examining all hypotheses we can think of concerning individual letters or words or sentences, and also for that of arranging them so that we can determine by enumeration what can be deduced from them.¹

The first step is to establish an order for our inquiry. This is obtained by careful observation, or it is devised by the intellect (vis intelligendi, the power of conceiving). One by one, we attempt each possible hypothesis. By means of the vis cognoscens, we recognize when a match has occurred. In this way, the correct hypothesis is eventually located.

¹Rules, X, AT, X, pp. 404-05. Cf. Discourse, II, AT, VI, pp. 18-19; Principles, IV, 205, AT, IX2, p. 323.

The method of enumeration in the Rules seems to be directly related to the "Ars Magna" of the mystical philosopher and poet of the thirteenth and early fourteenth centuries, Raymond Lull. I think that we can understand Descartes' method a little better by comparing it with the methods used by the Lullians, for whom Descartes showed a certain enthusiasm in 1619. In any case, there is enough similarity between Descartes' method and Lull's art to serve as a reminder that the young Descartes was very close to the Middle Ages.²

The Ars Magna was little more than a method of forming all possible combinations of selected terms. Lull had been preoccupied with sophisms which showed the weakness

²One modern critic summarizes Lull's contemporary reputation as follows: "Raymond Lull is no longer held to be a visionary, or, at best, an inventor of new logical formulas, but rather he is held today to be a profound and original thinker, who sought for the unity of science and attempted to identify Logic and Metaphysics, founding a species of rational realism; a true encyclopedist; a wise observer of nature, even though his claims as a chemist were false or doubtful; a remarkable poet and novelist, without rival among Catalan cultivators of the didactic and symbolic form; and, finally, he is held to be the text and model of his native language." Don Marceline Menéndez y Pelayo, Ensayos de critica filosófica (Madrid: Suárez, 1918), pp. 267-68.

Lull's Ars Magna was considered by many (who do not include his contemporary enthusiasts) to be his crowning achievement, the expression of his quest for the unity of science. The Ars Magna was the subject of a number of Lull's works, culminating in the Ars generalis ultima, begun at Lyon in 1305 and finished at Pisa in 1308. The Ars brevis quae est imago artis generalis, a summary of it, prepared at about the same time, proved to be much more popular. The Latin version was published seventeen times between 1484 and 1744.

of the Aristotelian syllogism. The formal correctness of an argument, constructed according to the traditional rules, did not guarantee its truth, as many sophistical fallacies clearly showed. He therefore turned to what he called a "material logic." By forming combinations of selected terms, the user of the Ars Magna could exhibit possible propositions and determine their material truth for himself.³

Two very early letters to Beeckman suggest that the young Descartes was attempting to remold the Lullian art into a form that would serve to resolve scientific questions: ". . . to show you simply the object of my enterprise, I want to give the public, not an Ars brevis of Lull, but a science with new foundations, permitting all the general questions to be resolved, which can be proposed in connection with any sort of quantity, continuous, each according to its nature."⁴

Although, in another letter that spring, he refers to the art disparagingly as the "Ars Parva," Descartes'

³Armand Llinares, Raymond Lulle: philosophe de l'action (Paris: Presses Universitaires de France, 1963), p. 220. The story of Lull's life, together with a description of his logic machines and a number of illustrations of them, can be found in Martin Gardner, Logic Machines and Diagrams (New York: McGraw-Hill, 1958), pp. 1-27. Although the Ars Magna may seem extraordinarily crude to us, it is, as Gardner points out, the forerunner of contemporary truth tables, which similarly exhibit all possible combinations of values of the constituent terms of a formula.

⁴To Beeckman, Mar. 26, 1619, AT, X, p. 156.

encounter with an old Lullian takes up most of the letter and is its only real topic, testifying to Descartes' interest in the art:

Three days ago in an inn of Dordrecht I met a wise man with whom I talked about the Ars parva of Lull. He boasted of being able to use the rules of that Art with such success that, he said, he was able to discourse for an hour on any subject whatever; then, if he were asked to speak for another hour on the same topic, he could find things to say which were completely different from the preceding ones, and so on through twenty hours at a stretch. If you can believe that, you will see it yourself. He was an old man, somewhat garrolous, whose knowledge, drawn from books, was found on his lips more than in his brain.

But I asked him to tell me with more exactitude if that Art did not consist in a sort of ordering of the parts of dialectic from which arguments are taken. He recognized that it was, adding nevertheless that neither Lull nor Agrippa had placed in their works certain necessary keys, so to speak, to open the secrets of that Art. And I certainly suspect him of having said that in order to attract the admiration of an ignorant person rather than to express himself with truth.

I would nevertheless like to examine this point, if I had the book. But, because you possess it, examine it, please, if you have the time, and write to me if you find something ingenious in that famous Art. I have enough faith in your mind that I am certain that you will easily see what the omitted points are, if there are any of them at all, which are necessary for the knowledge of the rest and which he calls the keys. . . .⁵

In a closing paragraph, Descartes tells Beeckman that he is leaving that day for Denmark. Beeckman's reply gives a very low estimate of the work of Lull and his

⁵To Beeckman, Apr. 29, 1619, AT, X, pp. 165-66. Agrippa, a commentator on Lull, was a well known sceptical author in his own right. Cf. Popkin, History of Scepticism, p. 176. Descartes seems to have read Agrippa's De occulta philosophia; cf. AT, X, pp. 231-32.

followers. There is, however, no evidence that Descartes ever received the reply.

During the summer that followed, Descartes enlisted in the troops of Maximilian of Bavaria. That autumn, on November 10, at Ulm, Descartes had his three famous dreams, which play a crucial role in determining his future vocation. It is possible to believe, then, that Descartes' encounter with the old Lullian helped to determine the form of the method.

Descartes' letter to Mersenne of Oct. 16, 1639, discussing Cherbury's De Veritate, gives indirect confirmation of this relationship. Cherbury gives the name "Zetetica" (from the Greek ζητεῖν, to seek) to a major section of his work. Of these, Descartes says:

His zetetica are quite good for helping some one to make the enumerations of which I speak on page 20; for, when all that they contain has been duly examined, then one can be sure that he has omitted nothing.⁶

The passage to which he refers, in the Discourse, is this last rule of the method: "And the last, to make everywhere enumerations so complete, and reviews so general, that I am assured of omitting nothing."⁷

In Cherbury's De veritate, "The Zetetica or Categories" appear as a section of chapter eight. Cherbury lists nine "Questions, which comprise all that it is

⁶To Mersenne, Oct. 16, 1639, AT, II, p. 599.

⁷Discourse, II, AT, VI, p. 19.

possible to ask, and beyond which it is impossible to imagine any others . . ."⁸ The system is suspiciously Lullian in structure. Like Lull, Cherbury has nine categories, and the system depends upon taking all possible combinations of these categories. The categories are existence, whatness, quality, quantity, relations, manner of existence, time, place, and purpose. At the lowest level are simple questions, e.g., "What is its purpose?" At the second level are combinations of two of these, e.g., "What is the purpose of the quality?" "--and so on up to the third, fourth, and even the tenth combination."

Gassendi's reaction to the *Zetetica* was to say that they "remind him of the extraordinarily tedious procedure of those misguided and futile persons who, following the Art of Lullus, have no hesitation in pouring forth streams of terms and even propositions on any given topic." While the scheme displays ingenuity, he says, it is little more than a laborious game.⁹

What, in the *Zetetica*, reminded Gassendi of Lull? Probably not that there were exactly nine terms, or that they were almost identical with Lull's rules. Cherbury says that he got the categories from the Scholastics, and Gassendi should have been reminded of them, rather than of

⁸Cherbury, *De veritate*, p. 242.

⁹Pierre Gassendi, *Opuscula*, III, pp. 414-15, quoted in Carré's introduction to *De veritate*, p. 55.

Lull. Instead, it is probably the method of joining simple terms to obtain all possible combinations of them, which is what Lull's logic machines were intended to do. This seems to be the meaning of the Cartesian method of "complete enumeration." That is, the problem is to be decomposed into its simple elements, which are then recombined in all possible ways. The correct combination is either recognized intuitively, by the power of recognizing, or it is compared with the experimental outcome.¹⁰

The application of the method of enumeration in the Rules with which we are most directly concerned at this point is that of the cryptogram or code. Descartes recommends forming all possible combinations in sequence, even though a more heuristic approach might sometimes give quicker results:

Thus, if we wished to read a writing veiled in unknown characters, we would certainly perceive no order, but nevertheless we can imagine one, both for

¹⁰On the Lullian elements in Descartes, see Rossi, "Memoria artificiale." According to Rossi, both Bacon and Descartes engaged in a "polemic against the magico-occult tradition," but both used expressions and methods derived from that tradition. In particular, Lull's "mnemotechniques" become Descartes' improved symbolism for the analytical geometry. The familiar image of the "tree of science," in the introduction to the Principles, comes from Lull. One major Lullian theme, on the unity of the sciences, is taken over intact by Descartes. I find this influence particularly confirmed by Descartes' interpretation of the dictionary in his 1619 dream as representing the unity of science. Rossi calls attention to Descartes' preoccupation with images and imagination, symbolism and memory, and combinatorial techniques, the construction of automata and "gardens of shadows," and a common logic for the sciences.

purpose of examining all hypotheses we can think of, concerning individual letters or words or sentences, and also for that of arranging them so that we can determine by enumeration what can be deduced from them. And we should be very careful not to waste time by trying to guess such matters by chance and without method, for even if such things can often be discovered without skill, and sometimes possibly more rapidly by chance than by method if we are lucky, nevertheless it blunts the acuteness of the mind, and so accustoms it to vain and childish procedures that afterward it always clings to superficialities and cannot penetrate into the heart of things.¹¹

Descartes recommends the same approach in attempting to form the "best" or most difficult anagram:

. . . thus if you wish to make the best anagram from the letters of someone's name, it is not necessary to go from the evident to the most difficult, nor to distinguish the absolute from the relative, for these are not involved here; but it will suffice to arrange such an order for examining the transpositions of the letters that we never try the same ones twice, and so that they are grouped in such classes that it is immediately apparent in which there is the greater chance of finding what we are seeking, for thus the task will often be not long, but childishly simple.¹²

The method for complete enumeration to obtain a cryptogram or its solution receives its practical application in the twelfth Rule:

. . . he who believes that whatever can be known about a magnet must be known in terms of certain simple and self-evident natures, will not be uncertain about what should be done, and will first diligently collect all information he can obtain about this stone, from which he will then try to deduce what

The Lullian influence has been vigorously denied by Henri Gouhier, Les premières pensées de Descartes.

¹¹Rules, X, AT, X, pp. 404-05.

¹²Rules, VII, AT, X, p. 391.

combination of simple natures is necessary to produce all those effects which are discovered in the magnet. Once he has discovered this, he can boldly assert that he has found the true nature of the magnet, in so far as it can be discovered by man on the basis of the available information.¹³

Method at the level of the Rules would appear to consist in a "careful and accurate . . . search for all things which bear upon any suggested inquiry," a mechanical system for forming all possible combinations of simple natures, and a comparison of each combination with the empirical or intuitive data.¹⁴ In this way we determine with certainty the truth or falsehood of a given hypothesis. Given strings A, B, and C on a musical instrument. To determine their relationships, compare A with B, then A with C, and finally B with C, which gives all possible combinations.¹⁵ We are assured of a complete enumeration. By experiment, we eliminate one or more of the combinations. If we succeed in eliminating all but one of them, we have a deductive proof that the remaining combination is the true one. In both the Rules and the Discourse, Descartes believes that we can attain to certain knowledge: ". . . we reject all knowledge which

¹³Rules, XII, AT, X, p. 427.

¹⁴Rules, VII, AT, X, p. 388.

¹⁵Rules, XIII, AT, X, p. 432. Cf. the Lullian diagram in the lower right-hand corner of Gardner, Logic Machines and Diagrams, p. 22, where the same list of combinations is given.

is merely probable, and judge that only those things should be believed which are perfectly known, and about which we can have no doubts."¹⁶

The method of enumeration gives knowledge with certainty, if we are permitted to make some assumptions about our data. We must be able to assume that the initial decomposition into simple natures can be carried out with certainty. It must also be feasible to perform a complete enumeration of all possible combinations. Such tasks can require astronomical amounts of time, and thus may not be practically possible. Forming all possible anagrams, as Descartes suggests, of a word which is only ten letters long, may require that we investigate more than three million cryptograms.

However, if the process can be carried out, then it is logically true that the result of the method is correct. For, given the disjunction, $A \vee B \vee C$, and given not-A and not-B, then C is logically entailed. This assures the certainty of the conclusion, but it requires the prior assumption that the enumeration is correct and complete, and that the two negations (not-A and not-B) are known with certainty. This sort of certainty may be possible in mathematical investigations, but it difficult to obtain such certainty in empirical questions.

¹⁶Rules, II, AT, X, p. 362; cf. Discourse, II, AT, VI, pp. 12-13.

As stated, then, the procedure described in the Rules really is a demonstration. The initial mechanical enumeration of all possible combinations of simple natures is seen to be complete. The experiments which eliminate various possibilities, considered simply as experiments or experiences, are not subject to doubt, as Descartes later points out in the Meditations. Thus there really is no point at which doubt can enter. Descartes' contemptuous rejection of the method of the "probable syllogism" in the Rules appears to be justified. He has given a method which attains certainty.

His enthusiasm for this method is somewhat modified, however, in the following letter to Mersenne, by the suspicion that it may not really be possible to carry out a complete enumeration of all the thoughts of men. Descartes has rejected someone's plan for a universal language, and he is here speculating about what a successful plan for such a language would require:

But I do not believe that your author has thought about that, as much because there is nothing in all his propositions which shows it, as because the invention of that language depends on the true Philosophy, for it is impossible otherwise to enumerate all the thoughts of men, and to place them in order, or even to distinguish them in such a way that they are clear and simple, which is, in my opinion, the greatest secret that one could have for the acquisition of true Knowledge [la bonne Science]. And if someone had properly explained what are the simple ideas which are in the imagination of men, out of which is composed everything that they think, and if that were accepted by everyone, I would dare to hope for a universal language next, very easy to learn, to pronounce and to write, and, what is the principal

thing, which would aid the judgment, representing everything to it so distinctly that it would be almost impossible to be deceived about it; in place of which, the words which we use are just the opposite, for they have nothing but confused significations, to which the mind of men has long been accustomed, and which is the reason that they understand almost nothing perfectly.¹⁷

The project for the construction of an artificial language for science was not developed, and it is thus only a curiosity here, foreshadowing some of the more serious efforts of our own century. What is of importance is the form that this artificial language would take. The units are "simple ideas" in the "imagination." These are combined or "composed" to form everything that men think. Descartes' theory of knowledge is thus radically atomistic. It bears a resemblance to his physics, in which all gross effects are explained by reference to the movement, location and shape of the small particles which compose them. We can also see more clearly how the causal principles, which operate in the realm of ideas, resemble the laws of motion, which operate in the realm of small particles. Ideas, in their composition and causality, behave very much like the particles. Just as, in the physics, the behavior of the entities of the visible world are supposed to be wholly explained by the behavior of their constituent particles, so also, in the mind, a "proper explanation" of the simple ideas will wholly explain all thoughts.

¹⁷To Mersenne, Nov. 20, 1629, AT, I, p. 81.

CHAPTER XIV

PROBABLE KNOWLEDGE AND MORAL CERTAINTY

The method of enumeration is never really abandoned in the later works. It sometimes seems to underlie the argument of the Meditations. In the third Meditation, for example, ideas are classified as adventitious, innate, or factitious. The idea of God is shown to be neither adventitious nor factitious, so that it must therefore be innate. But the word "enumerate" is not used in the Mediations, and I do not find that anything has taken its place.

Instead, the later works seem to rely on quite another approach to empirical knowledge. It is the method of the Discourse, and the accompanying physical treatises. It requires that we take, as hypotheses, certain theories concerning the subject under investigation. From these, we derive descriptions of individual events. If this derivation can be carried out, then the initial hypotheses are confirmed by the results.

At the time of the Discourse, Descartes is ready to claim that this method gives certain knowledge. He says that he has "demonstrated" the hypotheses from which

he has started, and that the hypotheses "explain" the effects. ". . . for experience renders the greater part of these effects very certain, the causes from which I deduce them serving not so much to prove them as to explain them; but, on the contrary, it is the causes which are proved by the effects."¹

The fallacy here is one that Descartes certainly should have recognized. It is that of affirming the consequent. Given hypotheses A, B, C, . . . , N, and propositions a, b, c, . . . m. Clearly, to show that the hypotheses entail the propositions, and to know or assume that the propositions are true, certainly does not prove that the hypotheses are true. The claim, in the Discourse, that this method gives certainty, has not been established.

In 1637, the year in which the Discourse was first published, a letter to Plempius suggests that Descartes was considering another approach to the problem. In reply to certain objections of Fromondus, Descartes attempts to exhibit, in syllogistic form, the arguments which he has used to show that the particles of water must be like tiny eels--long, slippery, and flexible at moderate temperatures--while the particles of oil must have branches like trees. He gives four arguments. If oil congeals more quickly than water, then this is an indication (index)

¹Discourse, VI, AT, VI, p. 76. The Haldane translation is wrong at this point.

that the particles have such a form. But oil does congeal more quickly. Therefore . . . (and Descartes does not attempt to state the conclusion precisely). Second, linens which have been dampened in water dry more quickly than those moistened with oil. Hence, we have another index or indication that the particles have the supposed form. Third, water is heavier than oil, indicating that the particles come closer together. This gives a third index. Finally, water is more volatile than oil, which is the fourth index.

All these things, to be sure, when they are considered separately, lead only to probability; but, being considered all together, they have the force of a demonstration. But if I had wanted to deduce all these things in the style of the dialecticians, I would certainly have exhausted the typographers and the eyes of the readers by the size of the volume.²

The tentative nature of this analysis, which is hardly concealed by the ironic form in which it is presented, is indicated when we try to fill in the dots after the "therefore." Descartes has proved that there are certain "indications" or "indices" that the particles take the form which he has hypothesized, but we do not know how to add indices together to get certainties.

If Descartes had been more familiar with the work on probability theory of some of his contemporaries, he might have recognized that a concatenation of probabilities like this would never give certainty: no matter how

²To Plempius, Oct. 3, 1637, AT, I, p. 412.

many dice we roll, it is always less than certain that one will come up six. Similarly, no matter how many indices we accumulate, it is always less than certain that the hypothesis which entails them is true.³

A few months later, Descartes is beginning to modify the meaning of "certainty" in such proofs. Writing to Mersenne, he says:

You ask if I hold that what I write about refraction is a demonstration; and I believe that it is, at least as much as it is possible to give in that subject, without having previously demonstrated the principles of Physics by Metaphysics (which I hope to do some day, but which has not yet been done), and to the extent that any other question of Mechanics, or of Optics, or of Astronomy, or of any other matter which is not purely geometric, or arithmetic, has ever been demonstrated. And if one wanted to call only the proofs of the geometers "demonstrations," it would then be necessary to say that Archimedes never demonstrated anything in Mechanics, nor Vitellion [Witelo] in Optics, nor Ptolemy in Astronomy, and so on, which, in all events, is not what is said. For it is enough, in such matters, that the authors, having presupposed certain things which are not manifestly contrary to experience, have spoken of the rest in order [consé-
quemment] and without making paralogisms, even though their suppositions might not be exactly true. . . . And you ought to know that there are only two ways of refuting what I have written: one is to prove by some experiments or reasons that the things that I have supposed are false; and the other that what I have deduced from them ought not to have been deduced.

³I can't avoid mentioning another curious thing about Descartes' characterization of the particles of water as like tiny eels. Descartes seems to forget that his particles are supposed to be defined entirely in terms of figure, shape and motion. He gives the eels a dispositional quality, flexibility, and even claims that they become inflexible when they get cold. This is supposed to explain the freezing of water. But heat and cold were supposed to be secondary qualities. They were to be explained by the movements of atoms, not to explain them. The metaphor has gotten out of hand.

. . . But for those who content themselves with saying that they do not believe what I have written, because I have deduced it from certain suppositions which I have not proved, they do not know what they are asking, nor what they ought to ask.⁴

The examples which Descartes gives are the hypothesis of the center of gravity in Archimedes, and Descartes' own hypothesis concerning the corpuscular nature of light, which was assumed to follow the laws of local motion. I think that we would want to speak of these as hypothetical constructs, the function of which is to explain the effects which are deduced from them. Deduction here would be different from the sort of deduction that the geometer performs, in that the geometer's starting point is a set of axioms which, for the seventeenth-century mathematician, are known to be true. The physicist's starting point, on other hand, is a set of explanatory hypotheses which are explicitly assumed. Hence Descartes' impatience with those critics who are contented with saying that they do not believe the assumptions. This is simply not an appropriate response to someone who says, "Let us assume that . . ."

It is interesting, incidentally, to notice that this treatment of the role of suppositions will form the basis of Descartes' own attempt to escape from the fate of Galileo. He will, in the Principles, assume that the earth moves, and that it evolved from a star-like state, even though he knows that these hypotheses, which are

⁴To Mersenne, May 17, 1638, AT, II, pp. 141-44.

contrary to Scripture, are completely false. Such a status for our explanatory hypotheses is not as peculiar as it sounds. We are today quite willing to construct theories involving absolute zero, free fall in a vacuum, frictionless motion, and so on, without committing ourselves to the existence of these ideal states.

On the other hand, Descartes is in danger of losing his whole battle against "occult" entities if he acknowledges the possibility of such hypothetical constructs. If we may admit the existence of corpuscular light rays or magnetic fields, why may we not also admit such entities as gravity and force, which seem no more "occult"? Descartes' answer, as we will see, is that such occult entities do not explain anything at all, but simply offer verbal, pseudo-explanations.

Another letter of the same period shows the difference:

Finally you say that "there is nothing so easy as to adjust some cause to an effect." But while there may actually be several effects to which it is easy to adjust various causes, one cause to each effect, it is nevertheless not so easy to adjust the same cause to several different effects, if it is not the true cause from which they procede; there are even some of them often which are such that it is enough to prove which is their true cause, by giving one of them from which they could clearly be deduced; and I claim that all those of which I have spoken are of this number. For if one considers that, in all that has been done until the present time in physics, people have only tried to imagine some cause by which the phenomena of nature could be explained, but they have almost never been able to succeed; then if one compares the suppositions of others with my own suppositions, that is, all their "real qualities," their

"substantial forms," their "elements," and similar things, of which the number is nearly infinite, with the sole supposition that I have made, that all bodies are composed of many particles, which is something that one often sees by one's own eyes, and which can be proved by an infinity of reasons (since, as for what I also introduce, namely, that the particles of such and such a body are of such a figure, rather than of some other figure, it is easy to demonstrate that to those who acknowledge that they are composed of particles); and finally if one compares what I have deduced from my suppositions, in connection with vision, salt, the winds, the clouds, the snow, thunder, the rainbow, and similar things, with what the others have derived from their suppositions, in connection with the same matters, I hope that that will be enough to persuade those who are not too preoccupied that the effects which I explain have no other causes than those from which I deduce them; although I reserve to myself the demonstration of it to another place.⁵

Here, at last, Descartes recognizes--I think for the first time--that he requires a proof of uniqueness for his hypotheses. While he can argue, as he does argue in this letter, that the set of assumptions with which he begins is simpler than the "almost infinite" set of entities upon which the Scholastics relied, he wants something more than this. Still, the mathematician's criterion of elegance may be the only basis upon which he can claim superiority for his hypotheses. But this would mean that the choice of axioms was dependent upon the will, and that some other, radically different axiom set might have been chosen. For Descartes, who was seeking a kind of absolute certainty, such an outcome would be difficult to accept.

⁵To Morin, July 13, 1638, AT, II, pp. 199-200.

What is needed, then, is a theory of confirmation and of probable knowledge. Such a theory is late in coming into the Cartesian system and does not seem to have been completely worked out. I think that we can understand it in terms of the Ockhamist critique of Aristotelian concepts of causality.

The second paragraph of the first Meditation begins with the words, "Now, therefore, that my mind is free from all cares" It describes the method of doubt, which Descartes proceeds to apply to his former beliefs.

I think that it is possible to take this "Now" quite literally, and to believe that Descartes did in fact renounce many of his former beliefs at a definite point in time. This might be identified with the trip that Descartes made to Paris in 1629. I have said that some of the new doctrines which appear in Descartes' work then seem to be Ockhamist in orientation. If Descartes did come into contact with Ockhamism at about this time, then he would have met rather an intensive critique of the traditional principles of causality.

In the Aristotelian tradition, the principle of causality was metaphysical in character. It was part of the order of being. The necessity of the causal connection was an existential necessity, characterizing the quidditas of the thing itself. So conceived, the Aristotelian causal principle, "everything which moves is moved by

another," serves a dual purpose. It provides a foundation for the proof of the existence of God, and it is required as the basis for any secure science of nature.⁶

Pierre d'Ailly points out that it is logically possible to suppose that a movement could begin without the agency of an external mover, simply through the removal of some hindrance to its motion. Between secondary causes and their effects (where God's creation is the primary cause), there is never a necessary connection, but a purely contingent one.⁷

Secondary causes are not part of the nature of things. The external world is known only through a sequence

⁶"Omne quod movetur ab alio movetur." Cf. Aquinas, Summa Contra Gentiles, I, p. 13; Summa theologiae, I, q. 11, a 3; Aristotle Physics VII. 1.

⁷D'Ailly, I Sent. q. III, a, 3. Cf. G. M. Manser, "Drei Zweifler auf dem Kausalprinzip im XIV. Jahrhundert," Jahrbuch für Philosophie und Spekulative Theologie, XXVII (1912), pp. 291-305. (The three doubters are d'Ailly, Nicholas of Autricuria, and William of Ockham).

Apparently d'Ailly has in mind a kind of trigger effect, rather than the sheer spontaneous initiation of motion that we think of when we imagine an uncaused movement. Aristotle discusses this sort of trigger effect at several points, e.g. Movement of Animals 701b2; Generation of Animals II. 2. 10 II. 7. 8. He also seems to have dealt with d'Ailly's other objections: "It is not evident [i.e. the causal principle], because circular motion would not be possible; nor is it evident, since there is the possibility of diverse kinds of cause." D'Ailly, I Sent. q. III, a. 2.

The passage which is paraphrased above is this: "Nulla causa secunda sic est proprie causa alicuius effectus, nec aliquis effectus sic ex natura rei sequitur ex aliqua causa secunda, quod causa necessario inferat effectus vel quod effectus necessario praesupponat illam causam; immo effectus pure contingenter antecedit effectum suum." IV Sent. q. I. Cf. Manser, "Drei Zweifler," p. 296.

of disconnected phenomena. We cannot even know of the existence of other men, or that they are different from asses.⁸

Descartes did not doubt the validity of the causal principle as applied to primary causality, or to the inner structure of our thought. There is no room for deception here, and we see these relationships directly, by the natural light.

In the realm of secondary causes, however, there is surely room for doubt. And, while we will certainly not want to read Hume's criticisms back into Descartes, it is still difficult to know how Descartes could have regarded secondary causation as clear and distinct, except in the very general sense in which it obeyed the three general laws of motion that he called "eternal truths."

The most serious break in the chain of cause and effect comes at the moment when size, shape, and motion are somehow translated into sensations. Descartes is

⁸"Simpliciter et absolute, nullum extrinsecum a nobis sensible evidenter cognoscitur esse ut puta quod albedo est, quod nigritudo est, quod homo est, quod homo est alius asino et sic de similibus." I. Sent. q. I. a 1.

Perhaps d'Ailly was thinking of the passage from Ecclesiastes that Descartes discusses in the sixth set of Replies: "I said in my heart with regard to the sons of men that God is testing them to show them that they are but beasts. For the fate of the sons of men and the fate of beasts is the same; as one dies, so dies the other." Eccl. 3:18-19a (R. S. V.); Replies, VI, AT, IX, p. 232. (Descartes' version has "mare" for "beast.")

notoriously unclear in his analysis of the manner in which the bodily pineal gland, together with the mental power of conceiving, transform bodily motions into ideas.

There are three kinds of causation in the Cartesian system. First, primary causation is expressed by a number of common notions, which seem to be variations on the principle that nothing comes from nothing, the greater cannot be the effect of the less, being cannot be a source of non-being or error, and so on. Second, secondary causation is expressed by the laws of nature and the rules of motion, which have a clear application to a geometrically-defined universe. But a third kind of causation is required for the a posteriori proofs of the laws of the special sciences. This kind of causality runs from the movements of particles to our perceptions of color, sound, and other sensations. The causal link between the small movements and the sensations is anything but clear. But our theories depend on this causal linkage for their confirmation or disconfirmation. Therefore, we can never attain to certainty in our theories.

By the time of the Principles, Descartes has adopted a schema which may be capable of meeting criticisms like those of the Ockhamists.

As we have seen, in the Discourse Descartes claimed to have proved the causes, which consist of geometrically-describable particles moving according to mathematically-

definable laws, by their effects, which consist of the phenomena of science and ordinary observation. This claim was somewhat weakened, but not withdrawn, in the correspondence which followed publication of the Discourse. The phenomena are said to be "indices" of their causes. But "index" is surely no more than a metaphor, the precise application of which is extremely vague. In addition, as I have suggested in the review of d'Ailly's criticisms of the causal principles, the causal linkages upon which Descartes' arguments depend are not sufficiently clear to serve as the basis for such a proof. Finally, and perhaps most important, the proof cannot really obtain to certainty, as Descartes claims. At best, a number of "indices" will give a high probability to the hypotheses which they are said to confirm.

Whatever the specific motivation, Descartes chooses rather a different schema to serve as the basis for empirical knowledge in the Principles.

The laws of nature and the rules of motion, as we have seen, were taken by Descartes as certainly true. Their basis is metaphysical, deriving from the unchanging nature of God, and the nature of body as extension, and they hold in all possible worlds. If we were to see events which seemed to violate these laws, we are told to prefer the laws, and assume that our sensations are misleading. The laws serve as the postulates of a scientific method.

Empirical hypotheses, however, receive rather a different treatment in the Principles:

We have remarked above that all the bodies which compose the universe are made of the same matter, which is divisible in all sorts of particles, and is already divided in many sorts, which are diversely moved, and of which the movements are in some fashion circular; and that there is always an equal quantity of these movements in the world: but we have not been able to determine in the same way how large the particles are, into which that matter is divided, nor what is the speed with which they are moved, nor what circles they describe. For since these things could have been ordained by God in an infinite number of ways, it is by experience alone, and not by the force of reasoning, that one can know which of all these ways he has chosen. That is why we are free now to suppose whatever we wish, provided that all the things which will be deduced from the suppositions accord entirely with experience.⁹

This passage might be contrasted with a somewhat similar passage in the Replies, in which Descartes also finds natural reason incapable of determining the manner in which God has willed to act:

As for what you [Mersenne] add, "that from the distinction of the soul and the body it does not follow that it is immortal, because one could still say that God had made it of such a nature that its duration ended with that of the life of the body," I confess that I have nothing to reply to it; for I do not have so much presumption as to attempt to determine, by the force of human reasoning, a thing which depends only on the pure will of God.¹⁰

In the Replies, natural reason is said to be incapable of determining the arbitrary will of God with re-

⁹Principles, III, 46, AT, IX2, pp. 124-25

¹⁰Replies, II, 7, AT, IX, pp. 119-20; cf. Principles, I, 25-26, AT, IX2, p. 36; Principles, III, 2-3, AT, IX2, p. 104; Meditations, Summary, AT, IX, p. 9.

spect to a doctrine of faith. Here, the issue may be settled by an appeal to revelation and the teachings of faith.

In the Principles, on the other hand, natural reason is again unable to determine God's inscrutable will, but the appeal here is not to faith, but to an arbitrary choice on the part of the human scientist, which is to be confirmed or disconfirmed by experiment.

The analysis is greatly complicated at this point, however, by the apologetic requirements of the Principles. The choice which Descartes immediately proposes is the hypothesis that God originally created only particles in motion, from which the present universe gradually evolved. Following the condemnation of Galileo, such a proposal could not be stated even as a hypothesis.¹¹ It is, then, introduced as a pure fiction, somewhat in the manner in which Le monde was explicitly a "fable." Perhaps we could call such fables "explanatory fictions." We could then regard them in the way in which a sophisticated legal theorist might regard the story of the social contract, as a fiction which gives coherence to a theory even though it is historically false.

But we would surely think that an explanatory fiction must have, for Descartes, a status different from what he calls a "moral certainty," if only because he

¹¹Cf. to ***, 1644?, AT, V, p. 550.



happens to want the former to be false, while the latter is very probably true.¹²

If this is so, then a remark which Descartes inserts at the end of section III, 47, of the French version of the Principles makes this distinction clear. But it is still puzzling, particularly when it is compared with the remarks in the Discourse on proving causes from their effects:

. . . I announce this expressly, in order to call attention to the fact that, although I speak of suppositions, I nevertheless make any such suppositions in such a way that their falsehood--which is well known--cannot provide the occasion for doubting the truth of the conclusions which will be derived from them.¹³

But the Discourse has claimed that if all the consequences of a hypothesis were found to be true, then the hypothesis itself has been demonstrated with certainty. In the Principles, this central contention of the Discourse must be discarded. All the conclusions which are derived from an explanatory fiction are true, but it itself is false. And since it is known to be false, its true consequences do not even make it probable. I do not know

¹²I take this to be the distinction between the "possibilities" of sec. 204 and the "moral certainties" of the Principles, IV, 205.

¹³Principles, III, 47, AT, IX2, p. 126. The sincerity of this declaration is open to serious doubt. Cf. to Mersenne, Feb., 1634, AT, I, p. 493; to Mersenne, Apr., 1634, AT, I, pp. 287-88; to Huygens, Jan. 31, 1642, AT, III, p. 523; etc.

how to reconcile this strange doctrine with the discussion of moral certainty at the end of the fourth part of the Principles.

What is more important, the criterion, by which we know that the explanatory hypothesis is false, is not available to natural reason. It is known only by the light of faith, which lies wholly outside the realm of science.¹⁴ As a result, we do not have a criterion within our science by which we can distinguish explanatory fictions from moral certainties. In itself, this lack of a criterion is not puzzling, because we know that moral certainties can be false, since they are no more than highly probable. What is puzzling is that we may, apparently, be morally certain of a proposition which we also know to be false.

It is tempting to try to cast Descartes, on this topic, into the role of a Parmenides, or a Hume. We might think of him as holding one view as absolutely, metaphysically, or logically true, while another view would be

¹⁴Compare the very different view which Descartes expresses, concerning a proposed book of Comenius, which would be a sort of compendium of current knowledge: "And finally, even though we are obliged to take care that our reasonings do not persuade us of anything which is contrary to what God has wished us to believe, I believe nevertheless that it is to apply Holy Scripture to an end for which God has not given it, to wish to derive from it the recognition of truths which belong only to human sciences, and which do not serve for our salvation." To ***, Aug., 1638, AT, II, p. 345. Descartes remarks a little earlier in this letter, that the author "seems to wish excessively to join religion and the revealed truths, with the sciences which are acquired by natural reasoning."

applicable to everyday life in the world of appearances or illusion. There would then be two quite unrelated kinds of truth, with no way of going from one to the other.

Such a role would fit Descartes badly. It is difficult to think of any other philosopher who has been more concerned with the practical applications of his crate than was Descartes.

For example, in the Principles, as in the earlier works, Descartes attempts to derive the general laws, and some of the more specific laws, from his metaphysical principles, to establish other specific laws through experiment, and, lacking either of these types of proof, to choose what is only probable. This last realm is not regarded as knowledge at all.

Thus, in the case of the disappearance of comets when they leave our system, Descartes concludes:

. . . And, in connection with such particular effects, for which we do not have enough experiments to determine what are the true causes which produce them, we must content ourselves with knowing some causes by which it could come about that they are produced.¹⁵

There is not the slightest indication that Descartes considers the realms of a priori knowledge and a posteriori knowledge to be mutually exclusive, or that there is a "realm of truth" over against a "realm of appearance." On the contrary, the whole force of the

¹⁵Principles, III, 132, AT, IX2, p. 185.

Cartesian argument is behind the claim that these realms--the a priori and the a posteriori--coincide, which is what we mean when we say that "the universe is rational," and which is, I think, what Descartes means when he says that "God is not a deceiver."¹⁶

It is particularly tempting to attempt to understand Descartes' cosmology in terms of modern relativity theory. Thus we would have him saying that it all depends on the coordinate system that one adopts. In one such system (of Cartesian coordinates) the earth is regarded as at rest, with the center-point of the earth at the origin of the three-dimensional coordinates. But, the relativist would say, we get a somewhat simpler set of equations for the motion of the planets and stars, if we adopt another coordinate system, in which motion is taken as relative to the fixed stars. The physical scientist, then, will adopt

¹⁶On the coincidence of a priori and a posteriori see especially the excerpts from the Port Royal Logic reproducing portions of Rules, XIII, in Lafleur's translation of the Rules, pp. 62-63. See also the letter to Mersenne, Apr. 10, 1632, AT, I, pp. 250-51: Concerning knowledge of the movement of the stars, ". . . even though they appear to be quite irregularly scattered here and there in the Heaven, I do not doubt in any case that there is a natural order among them, which is regular and determined. And the recognition of that order is the key and the foundation of the highest and most perfect Science that men could have in connection with material things; because by means of it one could recognize a priori all the various forms and essences of the terrestrial bodies; but instead, without it, we must content ourselves with divining them a posteriori, and by their effects." Is there the slightest suggestion that these two methods would not lead to identical results?

See also Replies, II, AT, IX, pp. 121-22.

this latter coordinate system, while the theologian will adopt the former system. Similarly, the scientist and the theologian can adopt various zero-points in time. According to one view, the zero-point might be taken when when the first vortices were established, out of which the stars and planets were formed. According to the theologians, the zero-point might be the first day of creation in the Genesis story. One view would be somewhat simpler for the physicist, while the other view would be proper for the religious person.

To interpret Descartes in this way would be to make him a modern relativist, or pragmatist, who may think of his geometry simply as a set of theorems based upon arbitrary postulates and derived by arbitrary rules, which are chosen, not because they are "true," but because they have some practical value, elegance, or other interest.

Such a view will not do for Descartes, however. For him, the light of faith simply takes precedence over natural reason, and the theories which conflict with it must be regarded as false. The metaphor of the cypher, in section 205 of the fourth part of the Principles, permits such a move. Given a series of words, written in some kind of cypher. We guess at the code for the cypher, and we find that we are able, decoding the cypher, to read a certain message. If the code is very simple and the message very long, we attain a very high degree of

probability for our conjecture. But we would have no guarantee, ever, that our conjecture is the right one. Although Descartes says that it is not "morally believable" that the conjecture is wrong, he does not say that he has attained metaphysical certainty.

The two languages, one the cypher and the other the message, are something like this. We have one language to describe the phenomena of sense. It will include terms which refer to color, sounds, smells, and so on, as well as terms which refer to many other things, some of which are clear and distinct, and some of which are very confused or unclear. This is our "ordinary language." The second language, an "artificial language," is composed only of terms which can be rendered clear and distinct. It will include only the qualities of size, shape, and motion, together with the laws of mathematics and geometry, some axioms and laws of motion, and perhaps some rules of logic. Descartes' claim is that he can provide a dictionary in which every sentence in the ordinary language can be translated into a sentence in the clear-and-distinct language, and for every sentence which is true in ordinary language, the translation provides a sentence which is true in the artificial language.

The Principles, then, are a kind of bi-lingual dictionary between the two languages.

Here is an example of the way in which the dictionary works. We want as scientists to know how to translate sentences in the ordinary language which contain the word "light" into sentences in the clear-and-distinct language which omit references to the perceived quality of light. In particular, we would like to know what it means to say that a piece of glass is "transparent."

But in order to understand how it is possible that a body which is quite hard and solid, for example, a glass or crystal, has in itself enough pores to give passage, following straight lines, in every direction, to the matter of the sky [i.e. to particles of light], and thus to have that which I say is required in a body to make it transparent: one can consider several apples or balls which are quite large and polished, which are enclosed in a net and pressed together in such a way that they compose, all together, a hard body. For on each side to which this body could be turned, if lead shot were poured over it, or other balls which were small enough to pass between these large balls, thus pressed together, one will see them flow straight down through that body by the force of their weight; and even, if enough of these shot were accumulated within that hard body, so that all the passages where they can enter are filled, at the same instant that the uppermost press those which are directly below them, that action of their weight will pass in a straight line to the lowest, and thus one will have the image of a body which is quite hard, quite solid, and nevertheless quite transparent, because there is no need that the particles of the second element [i.e. particles of light] have passages which are straight, to transfer the action of the light, than are those through which these shot descend among the apples.¹⁷

In our ordinary language, we know that it is true to say that light passes through transparent bodies in-

¹⁷Principles, IV, 17, AT, IX2, p. 208. Cf. Dioptrics, I, AT, VI, p. 86; to Mersenne, June 11, 1640, AT, III, pp. 81-82.

stantly. This section of the Principles shows how to eliminate two terms, "light" and "transparent," which are unclear, and thus do not appear in the artificial language. Light has already been described in terms of the motion of very tiny particles. We here learn how the transmission of motion can take place through an otherwise solid body. The apples and the shot are used as metaphors, because they can be described wholly in terms of shape, place, and motion. This metaphor or "image" for light now permits us to speak of light and transparency wholly in the clear-and-distinct language.

Altogether, the explanation seems rather successful, given that modern physicists can scarcely be said to have a better method of explaining why glass is transparent. Above all, we notice that Descartes knows precisely what will count as an explanation or translation here. There is not the slightest tendency to deal in occult qualities. He knows very well that to say that glass transmits light "because it is transparent" would not have any explanatory value. I think that it is this refusal to deal in pseudo-explanations, as much as any positive contribution that he may have made, that makes Descartes a modern scientist.

We return now to the question, What is the status of the "moral certainties"? It seems to follow from this description of their function that they are sentences which themselves usually do not refer directly to entities

which can be observed. When Descartes speaks of them as "morally certain," he means no more than that it is safe to use sentences derived from them as guides to action. "Moral" retains its reference to practice. By the light of faith, we can determine that some of these sentences are true or false, but the others are only probable. By their very nature, the smallest particles cannot be seen; they are the means by which we see. We do not have God's guarantee of their existence (except in the very general sense that we know that there are particles of some sort), and God therefore cannot be accused of deceiving us if the particles are somewhat different from the specific description that Descartes gives us.

We cannot know this. We cannot see with the eyes of God or the angels, who could perhaps know directly of the individual particles of light. Thus it makes no sense to ask for a kind of absolute truth here. What we need is a demonstration that the consequences derived from these explanatory hypotheses are reliable guides for action. This is what the Principles are intended to provide for us.

CHAPTER XV

SUMMARY AND CONCLUSION

In his earliest major work, the Rules for the direction of the mind, Descartes holds all true knowledge to be of one kind: "We should be concerned only with those objects regarding which our minds seem capable of obtaining certain and indubitable knowledge."¹ This Rule was progressively modified in Descartes' later works, producing at the last a hierarchy of types of certainty, each of which depends upon those which precede it in the "order of knowing."² It has been the purpose of this thesis to characterize those types of certainty.

At its foundations, our knowledge must have a kind of certainty which will meet the strongest criticisms that a sceptic can bring to bear. Such knowledge cannot be called into question by any hypothesis whatever. Since

¹Rules, II, AT, X, p. 362. Cf. Alquié, Descartes, pp. 26, 105-06.

²Cf. Meditations, Preface, AT, VII, p. 8; to Mersenne, Dec. 24, 1640, AT, III, p. 266.

it cannot be shaken by sceptical arguments, it may serve as the basis for further knowledge.³

Previous studies of Descartes' work have attempted to show that Descartes relied ultimately upon the faculty of "reason" or "intuition," or upon an implied postulate of "rationality" in the universe. I have rejected this approach, primarily because it relies upon an analysis which is appropriate, perhaps, to the Rules, but which tends to blur an important distinction in Descartes' later analysis of the understanding. In addition, I find that Descartes does not use these terms in any critical way after the time of the Rules.

Instead, it has been most valuable to consider two faculties which compose the understanding, which Descartes calls the "power of conceiving" and the "power of recognizing" (or "power of knowing"). The latter faculty is of particular interest when it functions as what Descartes calls the "natural light." In this role, it "sees" the simple relationships among ideas or concepts. These simple relationships, stated as propositions, serve as the "axioms" or "common notions" upon which all other certainties are based. No sceptical hypothesis can show them

³I am stating the criterion here in the form which most closely resembles that of Pierre d'Ailly, whose doctrines are described in Chap. IV and Appendix II. The method, however, is that of Descartes' first Meditation.

to be doubtful, and they are therefore said to be "manifest by the natural light."

Even though we may prefer to regard the axioms, particularly the causal axioms and those which assume a substance-mode ontology, simply as dogmas, Descartes' use of them avoids the frequent accusation of vicious circularity in his first proof of the existence of God. The axioms do not, as it is often alleged, depend for their certainty upon our knowledge of the existence of God, because we do not need to know that God exists in order to recognize that they are true.

Once the existence of God is known, however, we may attain certainty of another sort. This is associated with what Descartes calls "eternal truths" or "clear and distinct conceptions" (or "ideas"). These have been created by God, in two senses. First, the created order of the universe is such that it follows the rules of mathematics and of theoretical physics. Second, these rules or eternal truths have been "written" upon the mind. That is, the dispositional properties of our minds are such that we cannot conceive the contrary of an eternal truth. In this sense, they may be called "innate."⁴ Because we know that God exists, and that he is not a deceiver, we

⁴Cf. to ***, Aug., 1641, AT, III, p. 431; Principles, IV, 206, AT, IX2, pp. 324-25; Notes, XII, HR, I, pp. 442, 448; Replies, III, 10, AT, IX2, p. 147; to Dinet (Replies, VII), HR, II, p. 359.

know that he has created us in such a way that our clear and distinct conceptions conform to the created order of the universe.

If we would affirm only those things which we clearly and distinctly conceive, we would never make an error. But our understanding is finite. We cannot know all of the innumerable eternal truths, and we therefore cannot answer every question with certainty. If, nevertheless, we affirm some things which we do not conceive clearly and distinctly, we are exposed to the possibility of error. It is man's will, then, which is responsible for his errors in judgment, because it is his will which judges.

Descartes attempts in this way to avoid making God responsible for man's errors of judgment. In discussing the letters to Mesland and Elisabeth, in the mid-1640's, we have seen some of the difficulties that this solution encountered.

At the next level of certainty, the method of "enumeration" provides a method of attaining knowledge. This is proposed in the Rules and the Discourse. Although it may be implicit in the later writings, it is not explicitly named there. It would seem, however, to be a method for obtaining and verifying eternal truths. All possible solutions to a given question are set forth. Investigation then may show that one or more of these

solutions may be eliminated. In many cases, all but one of the possible solutions may be rejected, and the remaining possibility can then be asserted with certainty.

Another method, the a posteriori method or method of hypothesis, is said in the Discourse to be a way of attaining certainty. In the Principles, however, it gives only highly probable knowledge, or "moral certainty."⁵ This consists in stating, as hypotheses, one or more general rules or principles. Then it is shown that we can "deduce" (in a very broad sense of this term) the observable phenomena of the world from them. If our hypotheses are very simple in comparison to the amount of information that can be deduced from them, then, as Descartes correctly points out in the Principles, they become very probable.

In the thesis, I have attempted to show the extent to which Descartes may have borrowed certain terms and concepts from other writers. In particular, his use of the term "natural light" is rather like that of the fourteenth-century Ockhamist, Pierre d'Ailly. The "common notions" trace ultimately to the Stoics, but Descartes' reading of De veritate, by Herbert of Cherbury, in 1638, may have helped to redefine that term for him. The term "eternal truth" was part of the philosophical vocabulary of his day, but Descartes' rather specialized use of it may have come

⁵Discourse, VI, AT, VI, p. 76; Principles, IV, 205, AT, IX2, pp. 323-24.

most directly from his friend, Father Mersenne. And, finally, the method of enumeration bears a suspicious resemblance to the *Ars Magna* of Raymond Lull, with which Descartes was familiar in 1619.

The purpose of this study has not, however, been to speculate about the "sources" of Descartes' ideas. Such speculations can only show, I think, the extent of Descartes' originality, and the extent to which he improved upon his sources, particularly in the cases of Cherbury and Lull. Neither has it been my purpose to add one more to the long list of studies which have claimed that Descartes' analysis has failed. I do believe that it has failed, and that Descartes is forced back to a dogmatic assertion of his initial claims. But the discovery of this failure, if it is one, has not been the object of the thesis.

It seems to me that we need, today, a reevaluation of the claims of certain contemporary philosophies, which have become, in their own way, at least as dogmatic as the claims of the Scholastics of Descartes' time. The purpose of this study has been to call attention to another philosophical tradition, which may contain some tentative answers to contemporary problems.

APPENDIX I

ABBREVIATIONS AND SHORT TITLES

The following abbreviations have been used in the notes:

- AT René Descartes, Oeuvres de Descartes, Charles Adam and Paul Tannery, eds. (13 vols.; Paris: Cerf, 1897-1913).
- HR René Descartes, The philosophical works of Descartes, Elizabeth S. Haldane and G. R. T. Ross, trans. (2 vols.; New York: Dover, 1931).
- OL René Descartes, Oeuvres et lettres, André Bridoux, ed. (Paris: Bibliothèque de la Pléiade, 1953).
- OP René Descartes, Oeuvres philosophiques, Ferdinand Alquié, ed. (3 vols.; Paris: Garnier Frères, 1963-1967; vol. III, not yet published).

The following short titles of the works of Descartes are used in the text and footnotes. Dates and sources of each text have also been shown. The dates are those of first publication, or approximately those of composition of works which were not published during Descartes' lifetime.

| | |
|---------------------|--|
| <u>Burman</u> | <u>Interview with Burman</u> (1648). My trans. from French text of OL, corrected by Latin text of AT, V. |
| <u>Cogitationes</u> | <u>Cogitationes Privatae</u> (1619). My trans. from OP. |
| <u>Dioptrics</u> | <u>La dioptrique</u> (1637). My trans. from OP. |

| | |
|--------------------|--|
| <u>Discourse</u> | <u>Le discours de la méthode</u> (1637). My trans. from OP. |
| <u>Geometry</u> | <u>La géométrie</u> (1637). From <u>The geometry of René Descartes</u> , David Eugene Smith and Marcia L. Latham, trans. (New York: Dover, 1954). |
| <u>L'homme</u> | <u>Traité de l'homme</u> (1634). My trans. from OP. |
| <u>Meditations</u> | <u>Méditations</u> (1641). My trans. from OP. Note that AT, VII, contains the Latin version and AT, IX, the French version (1647). In general, I have used the French version. |
| <u>Meteorology</u> | <u>Les météores</u> (1637). My trans. from OP. |
| <u>Le monde</u> | <u>Le monde ou traité de la lumière</u> (1634). My trans. from OP. |
| <u>Notes</u> | <u>Notes directed against a certain programme</u> (1647). Trans. from HR. |
| <u>Objections</u> | <u>Objections . . . contre les précédentes méditations</u> (1641-1642). My trans. of sec. 1-4 and sec. 6 from French text of OP. Sec. 5 and 7 from HR. |
| <u>Olympica</u> | <u>Olympica</u> (1619). My trans. from the French version of OP. |
| <u>Passions</u> | <u>Les passions de l'âme</u> (1649). My trans. from OL. |
| <u>Principles</u> | <u>Les principes de la philosophie</u> (1644). My trans. from the French text of OL and AT, IX2. |
| <u>Replies</u> | <u>. . . Les réponses de l'auteur</u> (1641-1642). See <u>Objections</u> . |
| <u>Rules</u> | <u>Rules for the direction of the mind</u> (1628). From <u>Rules for the direction of the mind</u> , Laurence J. Lafleur, trans. (Indianapolis: Bobbs-Merrill, 1961). |

SearchLa recherche de la vérité (1641?).
My trans. from OP, and from HR.To . . .Letter to various correspondents.
(When the recipient of a letter is unknown, the letter is headed, "To ***.") My trans. from OP, OL, and AT.

APPENDIX II

PIERRE D'AILLY AND THE OCKHAMISTS

I have attempted to show that Descartes uses the term "natural light" in the Meditations in rather a peculiar way, which seems to resemble the way in which Pierre d'Ailly uses this term. In this appendix, I want to show that Descartes and d'Ailly share a number of doctrines, which appear in Descartes' work after 1630. This would suggest that Descartes read d'Ailly's writings, or came in contact with some other member of the school of Ockhamists to which d'Ailly belonged, at about that time.

As Popkin has pointed out, Descartes' trip to Paris in 1629, which brought him into conflict with the sceptical movements of his time, helped to motivate his work on the Meditations as an answer to the sceptics. Part of this reaction could certainly have included the reading, or re-reading (since Descartes' studies were in law), of the work of d'Ailly, in particular his unfinished commentaries on the Sentences of Lombard.¹

¹Quaestiones Super I, III et IV Sententiarum (Lyon: Nicolaus Wolff, 1500). D'Ailly's name does not appear in Descartes' writing, but one of Descartes' critics mentions him in such a way as to suggest that the

For d'Ailly, as a voluntarist, God's will is wholly free. He may create anything whatsoever, providing that it does not entail a formal contradiction. Both the laws of nature and the laws of ethics are wholly dependent upon God's will. But we cannot speak of God's will as distinct from his intellect. In God, will and intellect cannot be separated. Following Ockham, d'Ailly discards substantial forms and essences. "The metaphysic of essences banished, we are left with an utterly free God and a fragmented world of isolated singular entities radically contingent upon Him."²

We must, however, distinguish between the "absolute" and the "ordained" powers of God. In the absolute sense, God can indeed do anything whatsoever which does not violate the law of contradiction. By means of the "natural light" (as distinct from "natural reason") we are aware of the truth of the law of contradiction. One expression of the law of contradiction, d'Ailly maintains, is the truth of the assertion that I exist. It would be

name was a familiar one at the time. "As for the repugnancy of many worlds, Aliacensis [d'Ailly] and several others held this, founded upon other principles." Letter from Thibaut to Mersenne, April 1, 1647, AT, V, pp. 69-70.

²Francis Oakley, The political thought of Pierre d'Ailly: the voluntarist tradition (New Haven: Yale University Press, 1964), p. 25. (Hereinafter referred to as Political thought.) Prof. Julius Weinberg has pointed out to me that my reading of Ockhamist voluntarism is controversial at this point. It is generally regarded as extending only to ethical laws, not to the eternal truths.

a contradiction in terms, if a person were to assert that he does not exist. But little else is certain. It could happen, as the Ockhamists often pointed out, that God could so structure the world that all our immediate intuitions or perceptions were false. That is, he could create our intuitions directly, without the mediation of external objects. And he does so, from time to time, in producing miraculous visions.³ "D'Ailly ascribes absolute evidence only to such knowledge as is true under any circumstances, even in the event that God, of His absolute power, intervenes to suspend His ordained economy."⁴

Contrasting with such absolute evidence (evidentia absoluta), which is known to us by the natural light and defines the absolute power of God, there is, on the other hand, conditioned or relative evidence (evidentia conditionata vel secundum quid).

. . . by far the greater part of knowledge, from that of the existence of the world to that of the existence of God, cannot be absolutely evident to us. But it can, d'Ailly assures us, possess a conditioned or relative evidence, or at least be probable to us in natural reason. Such knowledge is valid or possesses a probable validity only in the present economy, or in other words may not be proof against a possible incursion of the absolute power of God.⁵

³D'Ailly, Sent. I, qu. 3, art. 1, M, f. 72v; cf. Oakley, Political thought, p. 29.

⁴Oakley, Political thought, p. 30.

⁵Oakley, Political thought, pp. 30-31.

The method of d'Ailly has been characterized as "methodic doubt." In the person of "Protervus" ("insolent"), who plays the role of a devil's advocate, the presumptuous arguments of the Aristotelians are challenged by a radical doubt.⁶

Rejecting expressly the error of the fideists, who claim that the weakness of rational knowledge requires an irrational act of faith, d'Ailly believes that

. . . it would be unjust to refuse to human nature the power to attain to undeniable truths. But it is important at the start to distinguish with care among the degrees of certainty, and not to confound, as is done so often, natural light and natural reason.

Here the terminology of the Cardinal of Cambrai [d'Ailly] differs as much from that of [the Ockhamist mathematician] Marsile d'Inghen as from Thomistic usage. By "natural light," d'Ailly designates every form of recognition [connaissance] which is absolutely indubitable in itself and under every hypothesis. If the philosopher forgets this condition, if he affirms as evident "by the natural light" propositions which hold only under a certain hypothesis, he will find himself without reply when faced by the objections of the "Protervus." But if he takes care to distinguish, in every circumstance, knowledge which is "without error" from knowledge which is "apparent," all his demonstrations will again find a positive value; not only those which are absolutely evident, but those also which are in the domain of natural reason alone, and which do not, as a consequence, have more than a relative evidence.⁷

⁶M. Patronnier de Gandillac, "Usage et valeur des arguments probables chez Pierre d'Ailly," Archives d'histoire doctrinale et littéraire du Moyen Age, VIII (1933), p. 47. (Hereinafter referred to as "Usage.")

⁷Gandillac, "Usage," p. 47, summarizing Sent. I, qu. 1, art. 1, fol. 36F; Sent. I, qu. 3, art. 3, fol. 82A.

Rejecting, as an Ockhamist, Aquinas' characterization of the natural light as "an active virtue which permits the intellect to abstract, that is, to seize the form from the composite material," d'Ailly must hold that the domain of the natural light is this: "The only thing that remains for us as an immediate certainty is the pure sensation." This pure sensation may be an illusion. There is no way in which we may be guaranteed that an external world exists. In some other possible world, or "in another economy," as d'Ailly puts it, there might be no such external existence. Considering the omnipotence of God, we must admit that the teachings of the senses have only a relative or "conditioned" value.⁸

Nevertheless, we can, through experience, discover a certain order in the world. ". . . if daily experience of a relative constancy in the phenomena of the created world makes us think that there really exists a natural order, the evidence of such an order is never anything but probable." Only the principle of contradiction can escape the doubts of Protervus. For d'Ailly, to deny "I exist" is a violation of the principle of contradiction. But this is not sufficient to show the existence of a real causal order, and, with it, the existence of God as a first cause. D'Ailly's reply to Protervus is to show that

⁸D'Ailly, Sent. I, qu. 1, art. 1, fol. 37A; cf. Gandillac, "Usage," pp. 48-49.

each causal transformation requires the presence of God. "To overcome the Protervus, it would be necessary to show that each of these transformations, either successive or simultaneous, requires the continuous presence of a first cause which supports and directs the efficacy of secondary causes. . . . But because potentiality is a word void of sense [under d'Ailly's nominalist assumptions] and because one cannot conceive of a spontaneous duration except if each present instant contains virtually the instant which follows it, the creature does not prolong its current existence except when it receives the renewal of its being from outside and in a continuous manner." The proof of the existence of a causal order, and with it the proof of the existence of a first cause, thus depends upon a concept of continuous creation, at each instant. But our knowledge of the external order is still, ultimately, subject to the doubts of Protervus, and the proof of God is not more than highly probable.⁹

Descartes attempted to show that the proof of God's existence, and of the external world, could be more than probable. The Ockhamist position represented by Pierre d'Ailly was a part of the tradition in which Descartes worked. Reviewing d'Ailly's position in detail helps us to see Descartes as a member of a tradition, which we

⁹Gandillac, "Usage," pp. 80-81. Gordon Leff, "Pierre d'Ailly," Encyclopedia of philosophy (New York: Macmillan and Free Press, 1967), I, pp. 61-62.

cannot ignore if we are to understand him. As Gilson has said,

The philosophy of Descartes will never be placed within a tradition, according to those who suppress that tradition by ignoring it. . . . It would be good if the existence of philosophers were better known, who, through the centuries, have fixed their gaze on this problem and have deepened the discussion of it; for example, the admirable "Quaestio disputata de rerum principio," by a Franciscan believed to be Duns Scotus . . . ; Matthieu of Aquasparta, "Quaestiones disputatas" . . . ; William of Ockham, Pierre d'Ailly, Pico de la Mirandola, etc.¹⁰

Descartes, after about 1630, shared rather a large number of doctrines with d'Ailly. These include: (1) The general Ockhamist rejection of needless entities, such as substantial forms and real qualities.¹¹ (2) Descartes' extreme voluntarism, expressed in the doctrine that God created the eternal truths of mathematics and physics. (3) The identification of God's will with his understanding. (4) The doctrine that God's will, and hence his ability to create, are limited only by the principle of contradiction.¹² (5) The claim that among the powers of God is the

¹⁰Etienne Gilson, "La pensée religieuse de Descartes," Revue de métaphysique et de morale, XXXII (1925), p. 533. (Reprinted in Etudes sur le rôle de la pensée médiévale dans la formation du système cartésien (Paris: J. Vrin, 1951), p. 293, note 2.

¹¹Cf. Rules, XI, AT, X, p. 413; Letter to Mersenne, Oct. 28, 1640, AT, III, pp. 211-12; to Launay, July 22, 1641, AT, III, p. 420; to Regius, Feb., 1642, OP, II, p. 921.

¹²Cf. Meditations, VI, AT, IX, pp. 57, 62; Letter to Regius, Oct. 6, 1642, AT, III, p. 567; to ***, Mar., 1642, AT, V, p. 544.

ability to falsify sensation, in such a way as to create the illusion of an external world where none exists. This is one of the distinctive claims of the Ockhamist tradition to which d'Ailly belongs. Descartes was interested in various forms of deceptive appearance from his earliest writings, but the specific claim that God might have created such deceptions does not appear until the time of the Meditations.¹³ (6) The doctrine of the radical discontinuity of time, requiring that God constantly preserve the existence of created objects, which seems so characteristic a Cartesian doctrine.¹⁴ (7) Finally, the doctrine that I cannot meaningfully question the assertion of my own present existence. For d'Ailly, as a nominalist, this involves only the claim that the form of the words is meaningless. For Descartes, ideas have a real existence, and thus the cogito can be the basis of a proof that I exist whenever I think.

¹³Cf. Cogitationes, AT, X, pp. 215-16. See also especially Henri Gouhier, Les premières pensées de Descartes: contribution à l'histoire de l'anti-renaissance (Paris: Vrin, 1958); Meditations, II, AT, IX, p. 19. Maignan, discussing the fourth set of Replies, cites the doctrine of Pierre d'Ailly on the Eucharist, where the appearance of bread is conjoined with the substance of Christ. Maignan, Cursus philosophicus (Toulouse, 1653), pp. 125, 130-35; cited by Geneviève Rodis-Lewis, "Machines et perspectives curieuses dans leurs rapports avec le cartésianisme," Dix-septième Siècle, V (1956), p. 472.

¹⁴Cf. Meditations, III, AT, IX, p. 39.

For our present purpose, the value in reviewing d'Ailly's work is not only that it throws some of Descartes' opinions into a historical context, but that it also suggests a precedent for Descartes' use of the term "natural light."

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