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a journal of political philosophy

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ON DESCARTES' DISCOURSE ON METHOD*

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Descartes was born in 1596. The *Discourse on Method,* a work of his full maturity, was published in French in 1637 as the prefatory essay in a volume containing also his essays on geometry, optics, and meteors. The full title of the famous "preface" is "Discourse on the method of conducting one's reason well and seeking truth in the sciences."

The first of the six parts into which the *Discourse* is divided begins with the following famous reasoning. Good sense, or reason, which is the power of judging well and distinguishing the true from the false, is the best distributed thing in the world. One knows this because all men, even those who are the hardest to satisfy in every other respect, are content with the amount of it that they possess. It is not likely that all are mistaken in this. Rather, what follows is that reason is naturally equal in all men. Thus the diversity of our opinions does not signify that some men are more reasonable or rational than others but only that we conduct our thoughts along diverse paths and thus take different things into account. What is important is not the natural equipment but the right application of it, the right road or method for the mind.

It is obvious that from the fact that all men are content with their good sense it does not follow that all men are equally endowed with it. Whether they are equally endowed must be determined empirically. Descartes himself denies throughout the *Discourse* that men are equally endowed. His argument here in fact means that if men judge badly about their judgment, they will believe their judgment to be good, and in fact this is what they do believe—let us say, to overstate the case, "unanimously." Being deceived about their judgment, there is hardly anything else they may not be deceived about. It would appear that nothing but Descartes or his "method," not even the philanthropy of God, stands between mankind and wholesale deception. His vindication of the method, apparently based on a flattery of mankind, is in fact based on the unflattering notion that between himself and the rest there is a colossal inequality. If that inequality is sufficiently great, his method cannot be a method in the simple sense: the more it is a true description of the way in which *his* mind moved, the less can it prescribe the way in which other men's minds might move. I shall try to maintain that the *Discourse on Method* does not teach a method in the simple sense of "how to do it yourself," that Descartes' caution against mistaking his teaching for such a thing bears on the meaning of the scientific project, and that the irony of Descartes' introductory thought is characteristic of his expression throughout the *Discourse.*

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Descartes' tacit reproval of the common opinion will animate his famous decision to doubt, i.e., reject at least provisionally, everything obvious and generally accepted as true. Aristotle's notion that the common opinion is not likely to be simply wrong is accepted by Descartes in the one context that shows it at its worst: the common opinion favoring common opinion. Descartes now confirms the thought that all men are equally endowed with reason by appealing to "the common opinion of the philosophers," i.e., the Scholastic Aristotelians, who teach that the essence of a species is in its entirety present in each member of the species. The success of Descartes' project will be measured, however, by the effectiveness with which that project discredits and supplants the Aristotelian-Scholastic conception of essences to which he here appeals. His ironic appeal to it is part of the foregoing rejection of the conclusion to which it seems to lead, and helps to prepare the elaboration of his intellectual autobiography, the core of which is his criticism and rejection of the sciences and arts as handed down to his time.

Descartes now opens the theme of his method as the means to something better than the vain and useless enterprises of almost all men, but he does so with what appears to be much modesty. He will show the story of his life as if it were a picture, gathering people's opinions about it through the common clamor ("*bruit commun*"), from which he will gain instruction. (This modest submission can be understood by juxtaposition with the state of his mind as expressed in Part Six, where he debates with himself the advantages of writing and publishing his thoughts. He admits there that he "almost never came across any critic of [his] opinions who did not seem either less rigorous or less balanced than [himself].") At any rate, Descartes now characterizes the ensuing autobiography as rather like a story or a fable in which, "among some examples that people can imitate there will perhaps be found some others which there will be reason not to follow." In the sequel, devoted to a showing of the value and the defect of each branch of received knowledge, Descartes will represent fables as harmful in leading men to believe impossible events to be possible; and history or "story" to contain distortions that lead men to conceive projects that exceed their powers. There is at least some reason, on the basis of Part One of the *Discourse,* to believe that Descartes was apprehensive not only of the dogmatists, his contemporary adversaries, but also of his epigoni.

Descartes has given the reasons for his dissatisfaction with the world of letters or books. In general, the learning of men is full of untruth and uselessness, contradiction and pretense. As soon as he could leave school – thus on the basis of a decision made while still a student – he abandoned books and resolved to cultivate no other science than what he could find "in [himself], or rather in the great book of the world." As he proceeds to describe the ensuing unlettered phase of his life, he shows that the preceding "or" was disjunctive, and that the order in which he enumerated the two unlettered studies was the reverse of the order in which he cultivated them. First, he studied in the great book of the world – as one might say, seeking to learn about the human things from and through conversing with men. His resolve

to follow this course conflicts with the reason he gave, a few pages earlier, against too much study of the ancient writings: such study is like too much travel; it estranges one from his own country. Descartes tells us that he went abroad in order to learn what men by their actions prove themselves really to believe. He thus informs us how to resolve the tension between his criticism of travel, made in the name of good citizenship, and his actual travel, done in the name of learning. He was not averse to becoming a sort of stranger to his own land. More generally, he put science above the polity. Less generally, he was perhaps not devoted to the regime of his own country. What he might have preferred to it is, I believe, faintly indicated by the fact that, in the closing passage of Part One, where he speaks of his travels, he uses the expression "great peoples" which he uses once more, at the end of Part Three, to describe the Dutch. His description of the Dutch regime is laconic but weighty, and as close to enthusiastic as he allows himself to become.

However this might be, the earlier objection against travel, made on behalf of the country, is replaced by an apparently more serious objection, made on behalf of knowledge: no amount of travel helped Descartes to any certain truth. The practices of men are as confused as their theories. If he discovered an inclination among men to pursue good and avoid evil, he says nothing about it. What he does say is that he now gave up the quest for knowledge among men and began to seek it "in himself," which proves to mean literally in solitude. Apparently, in order to understand anything about man and the world, it is necessary to withdraw from the world of man, which is the world of common opinion, of the pretension to equal *bon sens* with which Part One began.

Part Two, which contains the famous rules of the method, opens with Descartes' remark that he was in Germany because the war known to us as the Thirty Years War had "called him" there. His expression in the Latin translation is more emphatic: he was there because of "[his] curiosity to see the war." He makes a point of his perfect detachment from the issues, doctrinal and political, over which the war was being fought. The meaning of this detachment will become clearer presently. At any rate, during the winter cessation of active fighting he found himself in complete isolation in the celebrated *poêle* or stove-heated chamber. There, for some reason, one of the first things to occur to him was that generally there is less perfection in productions consisting of several parts and made by several makers than in the things on which only one maker has worked. He gives examples: buildings; cities; constitutions including that of the true religion legislated by God and that of Sparta; sciences; and finally man himself.

These examples are noteworthy in several particulars. In the first place, there is something resembling facetiousness in praising the unity of design in the constitution of the true religion so soon after a reference to the terrific wars of the Reformation. Further, Descartes goes on to praise the laws of Sparta because, framed by one man, they all tended to the same end. Next, speaking of man, Descartes is forced to acknowledge that, because we are not born with the full use of reason and must therefore be children before we are

men, we are inevitably pulled in opposite directions by our appetites and our preceptors, to the permanent impairment of our judgment. Implicit is a bold reflection on the creation of man by God in the image of God. First, according to Scripture, Adam was not made a child but was born perfect and entire. Any defects in his judgment had to arise otherwise than by Descartes' account, if childhood is inseparable from that account. But perhaps childhood is not necessary to the impairment of judgment. Descartes makes the conflict of appetites and preceptors responsible more directly. Did Adam have preceptors? He surely had one; or two, depending on the status of Eve. We do not have to ask if he had appetites. How can we doubt that Adam's appetites led him in one direction and the precept of his very creator urged him in another? He did not tend toward a single end.

The laws of Sparta had just been described as tending toward a single end. Is it imaginable that the fatal opposition of ends introduced into man's life by the war between appetites and preceptors could be overcome? Could mankind be directed toward a single end, as the Spartans apparently were for a time, by a grand constitution that reconciles precept with appetite once and for all? In Eden, man's appetite for knowledge was put in conflict with the precept that commanded obedience as the price of life. The rest of Part Two, indeed the rest of the *Discourse*, promises a way of making life the result of knowledge under a human constitution which resembles that of Holland rather than Sparta. If there is a political teaching in Descartes, and therewith in the scientific project of the modern age, this thought appears to be at its root.

Precisely for this reason, it surprises us not at all that the next paragraph of the *Discourse* contains Descartes' earnest disclaimer of any intention to reform any public affairs. He uses a striking argument to prove that he truly has no desire to meddle with public institutions. He says that he is merely recounting his own experiences and reporting the method that has worked for him, advising no one to imitate him. He goes further. He believes that most men will be unable to imitate him. Some, believing themselves more gifted than they are, would imitate him in rejecting the received opinions and would remain in confusion forever after, incapable of discovering the truth. Others, "having enough reason, or modesty, to judge that they are less able to distinguish the true from the false than are some other men by whom they can be taught, ought rather to be satisfied to follow the opinions of those others than to seek for better ones themselves." But according to Descartes the vain and the modest are almost all of mankind. His proof that he has no project for reconstituting the world seems to prove rather that if he had such a project, it would be based on a regime of which he might be the autocrat as well as sole maker, with perhaps no imitators but only a multitude of subjects. This bears heavily on the possible meaning of the method which is the chief burden of this Part of the *Discourse*.

Descartes now affirms that he would have been among the modest and docile part of mankind if he had had but a single teacher (*"un seul maître"*) or had not observed the differences that divide the learned. But things fell out otherwise; and moreover on his travels he learned that the differences

among peoples and nations are so far-reaching, the effects of custom and example so profound, that they are hard to calculate. He is driven back on the conclusion that a man alone is more likely to come upon truths than is a whole multitude, that he himself must undertake the search, and that the figure by which he can be described is, a man who walks alone and in the dark. Conspicuous in Descartes' sketch are the following features: a docile man taught entirely by a single master and thus freed from confusion; the immense effect upon us of our environment; a solitary walker who frees himself and perhaps can lead the others. The anticipation of Rousseau is striking, and compels us to wonder, parenthetically, how deep Rousseau's criticism of the scientific project really went.

Next, in the paragraph that immediately precedes the statement of the four rules of the method, Descartes refers to the three arts or sciences that he had studied which seemed as if they might contribute something to his project: logic, geometry, and algebra. Each has merits and defects. Logic is merely didactic, at worst sophistic, never heuristic. It contains many good things—he does not mention any by name—but these are so confounded with bad things that the whole is unusable. Geometry and algebra, in their then state, are described as practically useless, geometry so limited to figure as to overstrain the imagination and algebra so bound to particular procedures and symbols as to be an obstacle rather than an instrument for the mind. Thus he must find his own method, one which, "comprising the advantages of these three, will be exempt from their defects." It is necessary to observe that, a few pages later, speaking of his method which has then been exposed to the reader, Descartes says that he has "borrowed the best of geometric analysis and of algebra." He has either not borrowed what is good in logic, namely, its power to explain to others what one knows, or he did not really find anything worth borrowing in logic – the only part of philosophy that he regarded as in any respect promising; or perhaps both. There is some reason to believe that Descartes believed that his combination of geometrical and algebraic reasoning was reasoning simply, replacing philosophy in general and logic in particular. What this would do to metaphysics, to which he devotes all of Part Four in order to prove the existence of God and of the immortal soul, is a question we shall not get to in this paper; but it deserves consideration. In any case, he declares that he has "taken a firm and constant resolve not to fail one single time to observe [the four rules.]" With this vow, so reminiscent of the traditional formula defining justice that one wonders whether obeying these rules is not the only obligation of justice he will acknowledge, he now enters on the enumeration of the famous rules themselves.

The first of these is to accept as true only what is evidently so, namely, what presents itself to his mind clearly and distinctly.

The second is to divide every difficulty into as many parts as is possible and necessary.

The third deals with the order of thinking: begin with the simplest objects and thus the ones easiest to know. Ascend to the most composite. Suppose an order among things if there is not a natural order.

The fourth is to make thorough enumerations and surveys in order to avoid leaving things out of account.

These rules, so economically presented, receive an important elaboration in the remaining few pages of Part Two. To begin with, Descartes asserts that the example of geometrical reason led him to *imagine* that all truths are linked together in a long, perhaps an indefinitely long chain, so that none is too remote or too concealed to be uncovered. Everything is knowable. I believe it is fair to say that this truth, manifested to Descartes' imagination, does not in any apparent way emerge from the four rules. Rather, it points in the direction of the remark that he makes in the succeeding paragraph, namely, that in his concrete studies, "every truth that I found was a rule that served me afterwards in finding others." What this means might be easier to say if we take note more particularly of what he thinks his method makes possible. In the first place, impressed by the achievement of mathematicians, he realizes that they do not deal with any specific material but with "relations and proportions" among things. He desires in effect a universal science bound to nothing particular and therefore true of everything. That science must be a science of proportions. As for any particular proportion, the simplest or irreducible element is the line: there was nothing else that he could represent more distinctly to his imagination and his senses. To work with a number of relations or proportions, however, he had to resort to symbols. Thus he borrowed the best from geometry and algebra, as was said earlier.

What does this mean? Can we not say that the element of the universal science is what is most clear to the imagination and to the senses, or that the primary and irreducible can be represented by what is visible and thus imaginable? This will be contradicted in Part Four, where the explicit intention is to prove that God and the soul are and are incorporeal, and that neither can be understood by reduction to the imaginable, namely, body. Yet Descartes here (at the end of Part Two) gives us to understand that this reduction to an imaginable is the very core of the universal science, which bears a similarity to what he will elaborate as physics (Part Five) but which seems to conflict with what he treats as metaphysics. Evidently this raises a doubt about the so-called dualism of Descartes, a doubt that students of Descartes do not entertain as often as they would if they respected their master's admonition to doubt all things at least once.

In summary, Part Two begins by praising the superiority of things made by a single maker, shows the defectiveness of man and his condition, and presents a plan for uncovering every truth in the world, thus acquiring the power to remedy those defects.

In Part Three, Descartes enunciates the "three or four" maxims of the provisional morality, described as provisional because, presumably, a final morality cannot be understood before the system of knowledge as a whole has been brought to perfection. In fact, however, it is not clear that the "provisional" morality is not in principle a final morality too. This point can best be considered after the maxims themselves have been considered, and we will return to it.

There is a tacit link or transition between Parts Two and Three: at the end of Part Two, precipitancy and prejudgment are held up as the great offenses against philosophizing. At the beginning of Part III, irresolution is held up as the offense against action that Descartes most desires to avoid. I believe that the text bears out the following thought: the prevailing way of life is defective in promoting premature conclusion, dogmatism, or immobility in theorizing; and wavering, inconstancy, or fluctuation in practice. The three or four moral maxims will be seen to be rules for flexibility and constancy in turn; to speak more or less figuratively, a presentation of morality in terms of the alternative of motion and rest: a reduction of morality to physics, very generally speaking.

The first maxim is to rest quiet in the laws, customs, religion, and opinions of the people and authorities with which he lives. More interestingly, he will avoid excesses or extremes. His reason is not that of Aristotle, which finds the virtues to be means, but is a version of the reason of Machiavelli: if he chooses an extreme which happens to be the wrong one, he will be further from the right road than if he had temporized. (At this point it becomes clear that the perfection of knowledge will enable him infallibly to choose the right extreme, and will transform the provisional rule into a final rule having the identical moral content.) More particularly, all promises by which one abdicates any of his liberty are extremes and to be avoided. Of course he excludes such things as legal contracts. His point is that, like all things, he is himself in a state of flux, and especially his judgment is subject to improvement. The promise that he makes *to himself*, i.e. the one unbreakable or unmovable, is to improve his understanding. This is, incidentally, the effectual retraction of the first part of this maxim in which he pledged allegiance to the prevailing opinions.

The second maxim is to be firm, resolute, and unchanging in his actions once he has made the best decision he can in the present state of his knowledge. He says, "this makes it possible to relieve me of all the repentings and remorse that agitate the consciences of weak and vacillating minds . . ." The constancy that he avows here has a reflection on Christian morality, as his rejection of the mean in the first maxim had a reflection on pagan morality. One may notice that the final perfection of knowledge would if anything confirm this maxim and establish its intention beyond all provisionality.

The third maxim moves back to the theme of change or the goodness of his own flexibility. He must conquer himself rather than fortune and change his desires rather than the order of the world. More generally, he must learn to adjust his desires to what his understanding lets him know to be possible, which is the *natural* tendency of our will anyway. In this context he asserts that if we were to regard all goods outside ourselves (i.e. not our thoughts) as equally beyond our power, we would no more desire to be well, being sick, than to have incorruptible bodies or wings like the birds: But our thoughts, which he says are wholly within our power, have a great effect on the transformation of impossibles into possibles; and whatever he might have thought about resurrection of the body and immortality, he certainly believed that

medicine was subject to vast improvement, making it quite reasonable for sick people to desire health. What then does he mean by resolving to change himself rather than the *order* of the world? Perhaps to change his thoughts, the only things wholly in our power; which done sufficiently, of course he need not desire to change the order of the world or of nature. In the present context, he refers to the limitations on us "due to our birth," or as one might say, due to our mortality, or perhaps our nature. He might limit himself to producing all possible changes, through changing his thoughts, within the order of nature. How far does that order itself limit us? Until we have exhausted the knowledge of nature, we do not know where it limits us, or how it limits our desires. Our understanding and our will are eventually one and the same, coextensive with the utter limits of nature. Man appears in the image of God. The third moral maxim is superficially provisional but in its intention it regards eternity.

The fourth maxim is a review of the grounds of the preceding three. This, I believe, is why Descartes says at the outset that there are "three or four" such rules, the last being on a higher level than the three maxims proper. The leading theme of the fourth "provisional" rule is ways of life; more specifically the excellence of Descartes' philosophic way of life: the sweetness and innocence of the happiness it brings beyond all others "in this life" as he says first and "ever" as he says soon thereafter. He plainly avows that the three maxims are entirely in the service of his philosophizing, and his happiness. As such they are neither provisional nor essentially moral. They are the declaration of his freedom to move by appearing to rest. They are an impressive sign that in its classic and its loftiest state, modernity and modern science were innocent of the notion that science is impotent to judge of the ways of life, beginning with its own.

It might appear that Descartes' morality is perfectly idiosyncratic, a declaration of his own unboundable freedom to do everything needful and possible for the increase of his knowledge – the ultimate subordination of moral to intellectual virtue in the interest of the man whom no one or almost no one can imitate. As the conclusion to Part Three shows, his claim of freedom for himself is not without an echo that speaks to the life of the multitude. He reverts to his sojourn in the *poêle*, and tells of his leaving that solitude for nine years of wandering in the world while he cleared his mind of error, always doubting yet avoiding irresolution. Now his words are these: "my whole plan aimed only at giving me certainty, and at rejecting the moving earth *(la terre mouvante)* and the sand in order to find bedrock and solid ground." The Latin translation omits the words, "reject the moving earth." Perhaps the Latin translation is bolder in eliminating the intimation that Descartes' project aims at overthrowing the doctrine for which Galileo was troubled, and troubled in ways that led to the publication of this very book rather than *Le Monde*. In any case, Part Three closes with Descartes' account of his withdrawal to a new solitude, one which takes the place of the *poêle*. His retirement was to "a country [namely Holland] where the long continuance of the war has led to such institutions that the armies one en-

counters seem only to enable one to enjoy the fruits of peace so much the more securely, and where, in the midst of the crowd of a great people, very active, and more careful of their own business than curious about other people's, lacking none of the conveniences of the most populous cities, I was able to live as solitary and withdrawn as in the most forsaken wastes."

Parts Two and Three form a unity as being the vehicle of the four rules of method and the four rules of morality. As a whole, these two Parts are enclosed within the brackets of an opening that speaks of war and solitude and a closing that also speaks of war and solitude. The war is the religious and civil war of western Christendom. The first solitude is the literal solitude of the Imperial desert, where the only convenience was the famous stove to which Descartes draws (I believe ironically) such extraordinary attention. The second solitude is civilized, convenient indeed, animated by the freedom and justice implicit in everyone's minding his own business, and consequently conducive to philosophizing. One is almost reminded of the transition from the City of Pigs to the City of Convenience. In the *Discourse*, the road between the *poêle* and the city of Amsterdam is the method of Descartes. The freedom that he claims for himself is most hospitably ensconced in a tolerant, commercial society. It is easy to understand his desire to assure the princes of Europe that the reform of their states is a thing far from his mind.

As Parts Two and Three form a certain unity, so also do Parts Four and Five form a whole, but on a different plan. Parts Four and Five have in common the subjects of God and the soul, presented as metaphysics in Part Four and as Physics in Part Five. Descartes says in so many words that he has presented the foundation of his metaphysics but only the order of the questions in his physics. I believe it would be unwise to overlook the possibility that he has protected his physics more thoroughly than his metaphysics – exposing answers in the one case but only questions in the other – because his physics is primary and more serious.

According to the early passages of Part Four, Descartes' metaphysical enterprise is and must be directed first of all to finding an indubitable truth and thus a perfectly certain one. The truth on which he alights is that he exists. The proof of this is that he cannot feign the opposite without absurdity. To sustain this point, he feigns a number of things, chiefly that he has no body, that there is no world and that he is not in any place; but he says nothing about what is the value of such feigning or the meaning of it. To indicate the problem, the reader must look ahead to the place at which Descartes will assert that clear and distinct ideas are as such true—a "general rule"—and to that other place just following where he holds that his false conceptions come to him out of nothing. Descartes does not explicitly consider the possibility that feigning myself to have no body is to feign an absurdity. He does later say, while proving the incorporeal soul, that man is a composite being, i.e. composed of body and soul; but to avoid the blasphemy of identifying man with God he affirms that the perfection of simplicity belongs only to God, while to man belongs the dependence to which all compositeness testifies. He does not say much about that dependence. He

leaves one in doubt as to whether each component depends on the whole, the whole on each component, or—most portentous in the context—each component on the other. If this latter, then it is of the essence of man (adopting now the scholastic usage into which he falls in Part Four) that his soul and his body depend on each other, which is the tendency of Part Five, i.e. his physics. If body and soul depend on each other because we are not simple, i.e. not God, then to feign that we have no body is no more conducive to any truth than to feign that we do not exist; for in fact to feign that we have no body *is* to feign that we have no soul and no power to feign.

Descartes now reflects on his doubting, finds it the sign of an imperfection in himself, and sees that knowing is more perfect than doubting. How then did he, the imperfect being, obtain the power to conceive the perfect one? He explains that every conception of a thing less perfect than he is, is a dependency of his nature, while his conception of something more perfect than himself must depend on that more perfect being. Why this is so need not concern us for the present purpose, although it is quite important to bear in mind that, in Part Six, he will describe the truths of his science as consequences and *dependencies* not of more or less perfect beings but simply of more primary principles. What does concern us here is the formal argument employed by Descartes to sustain this proof of the existence of God: false ideas proceeding not from the truthful God but from nothing, if my idea of God's existence were false it would have to come from nothing. But ideas are real things, he says. Therefore it is as absurd that the idea of a perfect being proceed merely from a less perfect being as that more proceed from less or that something proceed from nothing. This remarkable proof of the existence of God depends on the self-evident absurdity of creation *ex nihilo*.

Let us consider one more attempt of Descartes to come to the aid of Scripture. He knows, from recognizing his imperfections, that he cannot be alone in the world. Something more perfect than himself must also exist and indeed must have been his creator. How does he move from his imperfections to the existence of God? By the simple reasoning that if he had made himself, he would have made himself not imperfect but on the contrary perfect, having all those desirable attributes that conduce to happiness and well-being—principally, of course, freedom from doubt. Having clumsily brought God's ommipotence into question in the one proof of his existence, Descartes seems to bring his philanthropy into question in order to strengthen that proof with another.

But Descartes wishes now to go on to other truths, in fact to further proofs of the existence of God. He begins by considering "the object of the geometers," which he conceives as a continuous body or a space extending indefinitely in all directions with parts divisible and movable. Now he observes that all the reasoning of geometers does not constitute proof that their object exists. This is his own example to illustrate his meaning: If one supposes a triangle, its angles must equal two right angles; but this gives no assurance at all that any triangle exists in the world. Whereas if one entertains the idea of a perfect being, the existence of that being is implicit in the idea of it as

perfect. Thus the existence of God is at least as certain as any geometrical demonstration. In this reasoning there seem to be some difficulties, however. First, his thought apparently drifted from *the* object of the geometers to such particular objects as triangles and spheres. What he proves to be questioning is the existence of the latter, which merely have their being—if they exist—in the former. Second, he seems to adopt the view that triangles exist ("are outside") in extension or not at all. But is it not true that the definition of a triangle as the figure with angles equalling two right angles *is* the existence of the triangle? The existence of the triangle in the mind, clearly and distinctly, perhaps carries with it the clear and distinct conception of the great space that any figure as such presupposes in the way that a part presupposes the whole. If this is true, then reflection on the object of the geometers leads to this thought: there are some things whose existence is guaranteed by their definition. The guarantee rests on this: the existence of the thing being wholly in the mind, the clear and distinct definition of it is its real being. But if it cannot be clearly and distinctly known, i.e. if it cannot be perfectly known, its existence is to say the least jeopardized. Drawing the existence of God into this region of demonstration raises or at least seems to raise large questions.

The nominal subject of Part Five is the order of the questions of physics. Descartes says that he will not present the substance of his physics because he does not wish to become embroiled with the learned. What Descartes does offer to do is to give a brief summary of what he wrote and would have published under different circumstances. First, he explained light; then the sun and stars as the sources of most of it; then the heavens, which transmit it; the planets, the comets, and the earth which reflect it; and especially all the bodies on the earth because they are either colored, transparent, or luminous; and finally man as the spectator of it. He fulfills his promise to say nothing substantive here, but he has let us understand that the order of questions is important and we therefore give attention to that. We notice that there are six things or classes of things "explained," beginning with light and ending with man. To this extent, the sketch just presented is reminiscent of Scripture; but it has a defect that the account in Genesis does not have: it says nothing of any living or growing thing as such except man. It has another defect which, if one may say so, it shares with the Scriptural account of the beginning: it makes no mention of fire. Like the account in Genesis, it alludes in its own way to fire: Descartes described the sun and the stars as the sources of *most* light; the Bible simply has light created before the sun, moon, and stars. But the place of fire in the order of things will soon prove to be important, because fire introduces heat and heat is indispensable to the Cartesian explanation of life which will take up most of Part Five. If I am not mistaken, the first reference to flame in the Bible is in the verse describing the flaming sword threatening death to Adam if, punished for seeking knowledge, he should offend further by seeking life. Fire will have a different place in the world of Descartes. As we are about to see, he will present the matter again, immediately, in different parts and in a different order, this time including fire, heat, and life. Perhaps the time has come to remind ourselves of the four

principal rules of his method: believe nothing not clear and distinct; divide the matter into the right parts; look to the order, beginning with the simple or irreducible, constructing an order if there is none by nature; and make careful enumerations to see that nothing has been left out. I believe that the correction of the "Biblical" account of the world and its replacement by the Cartesian one that I will describe next is the only illustration of the application of the method in its entirety in the *Discourse*.

Descartes abruptly commences again with these words. "All the same, in order to shade all these things a little, and to be able to say more freely what I think about them, without being obliged to follow or refute the opinions received among the learned, I decided to abandon this whole world to their disputes and to speak exclusively of what would take place in a new one if God now created somewhere in imaginary space enough matter to compose it and agitated [i.e. set in motion] variously and without order the various parts of that matter so as to compose a chaos, . . . and thereafter to do no more than to lend his ordinary [i.e. non-miraculous] concurrence to nature and allow it to act according to the laws he has established." The Cartesian construction has this order: mere matter; motion; the laws of nature (which operate in such a way that, regardless of how many worlds God might create, those worlds must all be alike); the arrangement of most of that matter into forming the heavens; some parts of it composing an Earth, some going into planets and comets, and some into a sun and stars. Next he introduces light, and especially, its instantaneous traverse of the heavens and its reflection from planets and comets towards earth. Then, among other important things, he makes clear that he does not suppose any heaviness in matter, yet the parts of it nevertheless all tend toward the center of the Earth. Now such affairs as tides and air currents and geological features and, at last, fire. Fire leads to the remark that there is sometimes heat *without* light, as well as light without heat. Now he notices the transformations that fire, apparently through its heat rather than its light, is able to produce in things. It melts some and hardens others; converts things into ashes and smoke; and finally forms glass of those ashes. Now Descartes' words: "this transmutation of ashes into glass seeming to me to be as wonderful [*admirable*] as any other that occurs in nature, I took particular pleasure in describing it."

Now there is an interlude, which also serves as a connection, in which Descartes shows that it makes no difference to the honor of God whether the world was created in an instant or acquired its present appearance gradually; but supposing the latter makes understanding easier. For this reason he explains the nature of things through their development.

The next theme is animals and, especially, man. Having just drawn attention to his reason for explaining things in terms of their development, he claims to be unable to enter on the discussion of man except through assuming that God made him all at once, out of the same matter hitherto described, but without a reasonable soul to begin with, and without anything by way of a nutritive or sensitive soul except by the exciting in his heart of one of those "fires without light" already referred to. We may be permitted

to pause for a moment to reflect on the articulation of the passages in the present context. First there was the "transmutation" of ashes into glass by the heat of fire, a change that impressed him immensely for a reason that he does not give. Then the thought that explanations of things in terms of their evolution (as we would say) ought not to be rejected as impious. Then the coming into being of man, whose mere life as such, as distinguished from his life qua rational for the moment, is explained through the animation of his mere matter by warmth. Scripture has it that "the Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul." Descartes shows us the wonderful but wholly natural transmutation of ashes by heat, and then the animation of man by that same power: heat is the great transmuter, the mediator between death and life. Descartes' conviction of this will inform that large section of Part Five in which he elaborates his notion of the circulation of the blood and the action of the animal spirits as thermal phenomena. The replacement of the "Biblical" enumeration has been in fact the replacement of light by heat.

There is one more point in this regard that is crucial. Descartes insists that he has not explained man's thinking, nor therefore his soul, that thing distinct from the body whose nature is only to think. Of course, the immortality of a man's soul requires that there be the disjunction between body and soul which Descartes is here maintaining. Descartes' position is therefore this: there is a principle of animation in body as such, and that principle is heat or anything more fundamental than heat to which heat itself can be reduced, say, the motion of particles. In addition there is a completely mysterious principle that accounts for reason or thought, and this second principle contributes nothing whatever to life as such, as is demonstrated by the living of the many irrational animals. The earthly death of a man is thus the cessation of whatever life as such means; and the survival of nothing but his reason. Immortality of the rational soul means the survival of a man's reasoning or thinking although his life itself does not continue. Men have found it easy to accept Descartes' famous dualism, but I find it difficult to reconcile its uninterpreted implications with reason. In order to progress on this theme, we turn directly to Part Six.

According to Descartes' prefatory synopsis of the *Discourse*, Part Six concerns "those things he believes necessary for moving further in the investigation of nature than has been done, and what reasons impelled him to write." He begins by alluding to the troubles which hover around him because of his beliefs, and again denies having any desire to reform the manners, politics, or religion of men. But the beneficent power of his physics is so great that he could not suppress that knowledge of his without sinning against the law that commands us all to respect the good of mankind. For he sees that there is a way to make use of everything in the world – stars, heavens, all things – "to make us as masters and possesssors of nature." He holds out the vision of man's enjoyment, without any effort or pain *(sans aucune peine)*, of the fruits of the earth; and more important, health, the well-being of the body on which not only life but the excellence of the mind itself depends. What he

holds up to view is a new and better Eden, one in which man will enjoy all things without pain and trouble not under the condition of ignorance but in enjoyment also of the fruit of the tree of knowledge: a philanthropic Eden at last.

He goes so far as to give hope of resisting the enfeeblement of old age through the application of his physics—who can say for how long? And then he connects the conduct of his own studies with the term inevitably to be imposed upon them by the brevity of his own life. Thus he must share his accomplishments with the public: "joining together the lives and labors of many men, that we may all together go farther than any individual might do."

He undoubtedly expected his project to survive him by a great deal. He adopts for himself the metaphor of the general in command of armies, winning the battles of science and life by directing the strivings of subsequent generations. He says with perfect openness that no one is as likely to be able to perfect his project as he himself is; for it is his product—one is tempted to say his creation—and he says "one cannot so well conceive something and make it one's own if one learn it from someone else as if one discover or invent [*invente*] it himself." He discloses that he will be parsimonious with his truths in the interest of truth; in order not to deprive other men of the pleasure of discovery; and to discipline his successors through hard work. Even the obstacles in the way to knowledge are planted philanthropically in the emerging Eden, without any animus to depreciate its denizens in comparison with its inventor—although their inferiority to him is real and probably incurable.

Descartes refers more than once to his need for the help of other men. He shares a bit of wisdom with respect to the gaining of men's assistance: do not depend on their good will but on their desire for gain. I believe that this maxim, the perfect paradigm for Adam Smith, might be understood as the thought that guides Descartes' presentation of his vast project as a whole to the world. So writing and so publishing as to charm mankind to a Mechanical Jerusalem, he achieves that conjunction of learning and politics which we saw anticipated at the end of Part Three in his praise of commercial Holland. Henceforth the city may love the scientist and may help him on his way for the most dependable because the lowest of reasons. In the new Eden it becomes difficult to distinguish the Lord from the serpent.

It is clear that Descartes expected his project, hence his thought and his reason, to live on in the minds and lives of untold generations. In this way, perhaps, his rational soul lives on and on, long surviving the extinction of that invisible heat which for a brief time quickened the ashes whose glory it was to harbor the audacious mind of Descartes.