

Discourse on Method

(1637)

by René Descartes

(Part Six)

It is now three years since I reached the end of the treatise that contains all these things. I was beginning to revise it in order to put it in the hands of a publisher, when I learned that some persons to whom I defer and who have hardly less authority over my actions than my own reason has over my thoughts, had disapproved of a physical theory published a little while before by someone else. I will not say that I accepted this theory, but only that before their condemnation I had noticed nothing in it that I could imagine to be prejudicial either to religion or to the state, and hence nothing that would have prevented me from publishing it myself, if reason had convinced me of it. This made me fear that there might be some mistake in one of my own theories, in spite of the great care I had always taken never to adopt any new opinion for which I had no certain demonstration, and never to write anything that might work to anyone's disadvantage. That was enough to make me change my previous decision to publish my views. For although I had had very strong reasons for this decision, my inclination, which has always made me dislike the business of writing books, prompted me to find excuses enough for deciding otherwise. The reasons, on one side and the other, are such that not only do I have some interest in stating them here, but also the public may be interested to know what they are.

I have never made much of the products of my own mind; and so long as the only fruits I gathered from the method I use were my own satisfaction regarding certain difficulties in the specu-

lative sciences, or else my attempts to govern my own conduct by the principles I learned from it, I did not think I was obliged to write anything about it. For as regards conduct, everyone is so full of his own wisdom that we might find as many reformers as heads if permission to institute change in these matters were granted to anyone other than those whom God has set up as sovereigns over his people or those on whom he has bestowed sufficient grace and zeal to be prophets. As regards my speculations, although they pleased me very much, I realized that other people had their own which perhaps pleased them more. But as soon as I had acquired some general notions in physics and had noticed, as I began to test them in various particular problems, where they could lead and how much they differ from the principles used up to now, I believed that I could not keep them secret without sinning gravely against the law which obliges us to do all in our power to secure the general welfare of mankind. For they opened my eyes to the possibility of gaining knowledge which would be very useful in life, and of discovering a practical philosophy which might replace the speculative philosophy taught in the schools. Through this philosophy we could know the power and action of fire, water, air, the stars, the heavens and all the other bodies in our environment, as distinctly as we know the various crafts of our artisans; and we could use this knowledge - as the artisans use theirs - for all the purposes for which it is appropriate, and thus make ourselves, as it were, the lords and masters of nature. This is desirable not only for the invention of innumerable devices which would facilitate our enjoyment of the fruits of the earth and all the goods we find there, but also, and most importantly, for the maintenance of health, which is undoubtedly the chief good and the foundation of all the other goods in this life. For even the mind depends so much on the temperament and disposition of the bodily organs that if it is possible

to find some means of making men in general wiser and more skilful than they have been up till now, I believe we must look for it in medicine. It is true that medicine as currently practised does not contain much of any significant use; but without intending to disparage it, I am sure there is no one, even among its practitioners, who would not admit that all we know in medicine is almost nothing in comparison with what remains to be known, and that we might free ourselves from innumerable diseases, both of the body and of the mind, and perhaps even from the infirmity of old age, if we had sufficient knowledge of their causes and of all the remedies that nature has provided. Intending as I did to devote my life to the pursuit of such indispensable knowledge, I discovered a path which would, I thought, inevitably lead one to it, unless prevented by the brevity of life or the lack of observations. *Fr. expériences*, a term which Descartes often uses when talking of scientific observations, and which sometimes comes close to meaning 'experiments' in the modern sense (its root being derived from *Lat. experior*, 'to test'). †1 And I judged that the best remedy against these two obstacles was to communicate faithfully to the public what little I had discovered, and to urge the best minds to try and make further progress by helping with the necessary observations, each according to his inclination and ability, and by communicating to the public everything they learn. Thus, by building upon the work of our predecessors and combining the lives and labours of many, we might make much greater progress working together than anyone could make on his own.

I also noticed, regarding observations, that the further we advance in our knowledge, the more necessary they become. At the beginning, rather than seeking those which are more unusual and highly contrived, it is better to resort only to those which, presenting themselves spontaneously to our senses,

cannot be unknown to us if we reflect even a little. The reason for this is that the more unusual observations are apt to mislead us when we do not yet know the causes of the more common ones, and the factors on which they depend are almost always so special and so minute that it is very difficult to discern them. But the order I have adopted in this regard is the following. First I tried to discover in general the principles or first causes of everything that exists or can exist in the world. To this end I considered nothing but God alone, who created the world; and I derived these principles only from certain seeds of truth which are naturally in our souls. Next I examined the first and most ordinary effects deducible from these causes. In this way, it seems to me, I discovered the heavens, the stars, and an earth; and, on the earth, water, air, fire, minerals, and other such things which, being the most common of all and the simplest, are consequently the easiest to know. Then, when I sought to descend to more particular things, I encountered such a variety that I did not think the human mind could possibly distinguish the forms or species of bodies that are on the earth from an infinity of others that might be there if it had been God's will to put them there. Consequently I thought the only way of making these bodies useful to us was to progress to the causes by way of the effects and to make use of many special observations. And now, reviewing in my mind all the objects that have ever been present to my senses, I venture to say that I have never noticed anything in them which I could not explain quite easily by the principles I had discovered. But I must also admit that the power of nature is so ample and so vast, and these principles so simple and so general, that I notice hardly any particular effect of which I do not know at once that it can be deduced from the principles in many different ways; and my greatest difficulty is usually to discover in which of these ways it depends on them. I know no other means to dis-

cover this than by seeking further observations whose outcomes vary according to which of these ways provides the correct explanation. Moreover, I have now reached a point where I think I can see quite clearly what line we should follow in making most of the observations which serve this purpose; but I see also that they are of such a kind and so numerous that neither my dexterity nor my income (were it even a thousand times greater than it is) could suffice for all of them. And so the advances I make in the knowledge of nature will depend henceforth on the opportunities I get to make more or fewer of these observations. I resolved to make this known in the treatise I had written, and to show clearly how the public could benefit from such knowledge. This would oblige all who desire the general well-being of mankind - that is, all who are really virtuous, not virtuous only in appearance or merely in repute - both to communicate to me the observations they have already made and to assist me in seeking those which remain to be made.

Since then, however, other considerations have made me change my mind. I have come to think that I must continue writing down anything I consider at all important, when I discover its truth, and that I should take as much care over these writings as I would if I intended to have them published. For this will give me all the more reason to examine them closely, as undoubtedly we always look more carefully at something we think is to be seen by others than at something we do only for ourselves; and often what seemed true to me when I first conceived it has looked false when I tried to put it on paper. This plan will also ensure both that I lose no opportunity to benefit the public if I can, and that if my writings have any value, those who get them after my death can make the most appropriate use of them. But I was determined not to agree to their publication during my lifetime, so that neither the opposi-

tion and controversy they might arouse, nor the reputation they might gain for me, would make me lose any of the time I planned to devote to my self-instruction. Every man is indeed bound to do what he can to procure the good of others, and a man who is of no use to anyone else is strictly worthless. Nevertheless it is also true that our concern ought to extend beyond the present, and that it is good to neglect matters which may profit the living when we aim to do other things which will benefit posterity even more. In any case I am willing to acknowledge that the little I have learned so far is almost nothing in comparison with that which I do not know but which I hope to be able to learn. Those who gradually discover the truth in the sciences are like people who become rich and find they have less trouble making large profits than they had in making much smaller ones when they were poorer. Or they may be compared with military commanders, whose forces tend to grow in proportion to their victories, but who need more skill to maintain their position after losing a battle than they do to take towns and provinces after winning one. For attempting to overcome all the difficulties and errors that prevent our arriving at knowledge of the truth is indeed a matter of fighting battles: we lose a battle whenever we accept some false opinion concerning an important question of general significance, and we need much more skill afterwards to regain our former position than we do to make good progress when we already have principles which are well-founded. For my part, if I have already discovered a few truths in the sciences (and I hope that the contents of this volume warrant the judgement that I have found some), I can say that these discoveries merely result from and depend upon my surmounting of five or six principal difficulties in battles where I reckon I had fortune on my side. I even venture to say that I think I need to win only two or three other such battles in order to achieve my aims completely, and

that my age is not so far advanced that I may not in the normal course of nature still have the time to do this. But the more hopeful I am of being able to use my remaining years effectively, the more I think I am obliged to plan my time carefully; and many occasions for wasting time would undoubtedly arise if I published the fundamental principles of my physics. For although these principles are almost all so evident that they need only to be understood to be believed, and although I think I can demonstrate all of them, yet since it is impossible that they should accord with all the diverse opinions of other men, I foresee that I should often be distracted by the controversies they would arouse.

It may be claimed that such controversies would be useful. Not only would they make me aware of my mistakes, but also they would enable others to have a better understanding of anything worthwhile that I may have discovered; and, as many people are able to see more than one alone, so these others might begin to make use of my discoveries and help me with theirs. But although I recognize that I am extremely prone to error, and I almost never trust the first thoughts that come to me, at the same time my acquaintance with the objections that may be raised prevents me from expecting any benefit from them. For I have already had frequent experience of the judgements both of those I held to be my friends and of some I thought indifferent towards me, and even of certain others whose malice and envy would, I knew, make them eager enough to reveal what affection would hide from my friends. But it has rarely happened that an objection has been raised which I had not wholly foreseen, except when it was quite wide of the mark. Thus I have almost never encountered a critic of my views who did not seem to be either less rigorous or less impartial than myself. Nor have I ever observed that any previously unknown truth has been discovered by means

of the disputations practised in the schools. For so long as each side strives for victory, more effort is put into establishing plausibility than in weighing reasons for and against; and those who have long been good advocates do not necessarily go on to make better judges.

As for the benefit that others might gain from the communication of my thoughts, this could not be so very great. For I have not yet taken them sufficiently far: I need to add many things to them before applying them in practice. And I think I can say without vanity that if anyone is capable of making these additions it must be myself rather than someone else - not that there may not be many minds in the world incomparably better than mine, but because no one can conceive something so well, and make it his own, when he learns it from someone else as when he discovers it himself. This is especially true in the case under consideration. I have often explained some of my opinions to highly intelligent persons who seemed to understand them quite distinctly when I told them about them; but, when they repeated them, I observed that they almost always changed them in such a way that I could no longer acknowledge them as my own. For this reason I should like to beg future generations never to believe that I am the source of an opinion they hear unless I have published it myself. I do not wonder at the absurdities attributed to all the ancient philosophers whose writings we do not possess; nor do I conclude from these attributions that their thoughts were highly unreasonable. As they were some of the best minds of their time, I conclude rather that their thoughts have been misreported. We see too that it has almost never happened that any of their followers has surpassed them; and I am sure that Aristotle's most passionate contemporary followers would count themselves fortunate if they had as much knowledge of nature as he had, even on the condition that they should never know any more. They are like

ivy, which never seeks to climb higher than the trees which support it, and often even grows downward after reaching the tree-tops. For it seems to me that they too take downward steps, or become somehow less knowledgeable than if they refrained from study, when, not content with knowing everything which is intelligibly explained in their author's writings, they wish in addition to find there the solution to many problems about which he says nothing and about which perhaps he never thought. But this manner of philosophizing is very convenient for those with only mediocre minds, for the obscurity of the distinctions and principles they use makes it possible for them to speak about everything as confidently as if they knew it, and to defend all they say against the most subtle and clever thinkers without anyone having the means to convince them that they are wrong. In this they seem to resemble a blind man who, in order to fight without disadvantage against someone who can see, lures him into the depths of a very dark cellar. These philosophers, I may say, have an interest in my refraining from publishing the principles of the philosophy I use. For my principles are so very simple and evident that in publishing them I should, as it were, be opening windows and admitting daylight into that cellar where they have gone down to fight. But even the best minds have no reason to wish to know my principles. For if they want to be able to speak about everything and acquire the reputation of being learned, they will achieve this more readily by resting content with plausibility, which can be found without difficulty in all kinds of subjects, than by seeking the truth; for the truth comes to light only gradually in certain subjects, and it obliges us frankly to confess our ignorance where other subjects are concerned. But if they prefer the knowledge of some few truths to the vanity of appearing ignorant of nothing (and undoubtedly the former is preferable), and if they wish to follow a plan similar to mine,

then in that case I need tell them nothing more than I have already said in this discourse. For if they are capable of making further progress than I have made, they will be all the more capable of discovering for themselves everything I think I have discovered. Inasmuch as I have examined everything in an orderly manner, it is certain that what still remains for me to discover is in itself more difficult and more hidden than anything I have thus far been able to discover; and they would have much less pleasure in learning it from me than in learning it for themselves. Besides, by investigating easy matters first and then moving on gradually to more difficult ones, they will acquire habits more useful to them than all my instructions could be. For my part, I am convinced that if from my youth I had been taught all the truths I have since sought to demonstrate, and so had learned them without any difficulty, I should perhaps never have known any others; or at least I should never have acquired the habit and facility, which I think I have, for always finding new truths whenever I apply myself in searching for them. In short, if there was ever a task which could not be accomplished so well by someone other than the person who began it, it is the one on which I am working.

True, as regards observations which may help in this work, one man could not possibly make them all. But also he could not usefully employ other hands than his own, except those of artisans, or such persons as he could pay, who would be led by the hope of gain (a most effective motive) to do precisely what he ordered them to do. For voluntary helpers, who might offer to help him from curiosity or a desire to learn, usually promise more than they achieve and make fine proposals which never come to anything. In addition, they would inevitably wish to be rewarded by having certain difficulties explained to them, or at any rate by compliments and useless conversation, which could not but waste a lot of his time. And as for the observa-

tions that others have already made, even if they were willing to communicate them to him (something which those who call them 'secrets' would never do), they are for the most part bound up with so many details or superfluous ingredients that it would be very hard for him to make out the truth in them. Besides, he would find almost all of these observations to be so badly explained or indeed so mistaken because those who made them were eager to have them appear to conform with their principles - that it would simply not be worthwhile for him to spend the time required to pick out those which he might find useful. So if there were someone in the world whom we knew for sure to be capable of making discoveries of the greatest possible importance and public utility, and whom other men accordingly were eager to help in every way to achieve his ends, I do not see how they could do anything for him except to contribute towards the expenses of the observations that he would need and, further, prevent unwelcome visitors from wasting his free time. But I am not so presumptuous that I wish to promise anything extraordinary, nor do I entertain thoughts so vain as the supposition that the public ought to take a great interest in my projects. Apart from that, I am not so mean-spirited that I would willingly accept from anyone a favour that I might be thought not to deserve.

All these considerations taken together caused me to decide, three years ago, that I did not wish to publish the treatise I had ready then, and made me resolve not to publish any other work during my lifetime which was so general in scope or by which the foundations of my physics might be understood. Since then, however, two further reasons have compelled me to include here some essays on particular topics and to give to the public some account of my actions and plans. The first is that, if I failed to do so, then many who knew of my earlier intention to publish certain writings might suppose that my reasons for

not doing so were more discreditable to me than they are. I am not excessively fond of glory - indeed if I dare to say so, I dislike it in so far as I regard it as opposed to that tranquillity which I value above everything else. At the same time I have never tried to conceal my actions as if they were crimes, or taken many precautions to remain unknown. For if I had done this I thought I would do myself an injustice, and moreover that would have given me a certain sort of disquiet, which again would have been opposed to the perfect peace of mind I am seeking. And since my indifference as to whether I was well-known or not made it unavoidable that I should gain some sort of reputation, I thought I ought to do my best at least to avoid getting a bad one. The other reason compelling me to write this is that every day I am becoming more and more aware of the delay which my project of self-instruction is suffering because of the need for innumerable observations which I cannot possibly make without the help of others. Although I do not flatter myself with any expectation that the public will share my interests, yet at the same time I am unwilling to be so unfaithful to myself as to give those who come after me cause to reproach me some day on the grounds that I could have left them many far better things if I had not been so remiss in making them understand how they could contribute to my projects.

I thought it convenient for me to choose certain subjects which, without being highly controversial and without obliging me to reveal more of my principles than I wished, would nonetheless show quite clearly what I can, and what I cannot, achieve in the sciences. I cannot tell if I have succeeded in this, and I do not wish to anticipate anyone's judgements about my writings by speaking about them myself. But I shall be very glad if they are examined. In order to provide more opportunity for this, I beg all who have any objections to take the trouble to send them to my publisher, and when he informs me about them I shall at-

tempt to append my reply at the same time, so that readers can see both sides together, and decide the truth all the more easily. I do not promise to make very long replies, but only to acknowledge my errors very frankly if I recognize them; and where I cannot see them I shall simply say what I consider is required for defending what I have written, without introducing any new material, so as to avoid getting endlessly caught up in one topic after another.

Should anyone be shocked at first by some of the statements I make at the beginning of the Optics and the Meteorology because I call them 'suppositions' and do not seem to care about proving them, let him have the patience to read the whole book attentively, and I trust that he will be satisfied. For I take my reasonings to be so closely interconnected that just as the last are proved by the first, which are their causes, so the first are proved by the last, which are their effects. It must not be supposed that I am here committing the fallacy that the logicians call 'arguing in a circle'. For as experience makes most of these effects quite certain, the causes from which I deduce them serve not so much to prove them as to explain them; indeed, quite to the contrary, it is the causes which are proved by the effects. And I have called them 'suppositions' simply to make it known that I think I can deduce them from the primary truths I have expounded above; but I have deliberately avoided carrying out these deductions in order to prevent certain ingenious persons from taking the opportunity to construct, on what they believe to be my principles, some extravagant philosophy for which I shall be blamed. These persons imagine that they can learn in a single day what it has taken someone else twenty years to think out, as soon as he has told them only two or three words about it; whereas the more penetrating and acute they are, the more prone to error they are and the less capable of truth. As to the opinions that are wholly mine, I do not

apologize for their novelty. If the reasons for them are considered well, I am sure they will be found to be so simple and so much in agreement with common sense as to appear less extraordinary and strange than any other views that people may hold on the same subjects. I do not boast of being the first to discover any of them, but I do claim to have accepted them not because they have, or have not, been expressed by others, but solely because reason has convinced me of them.

If artisans are not immediately able to put into operation the invention explained in the Optics, I do not think it can on that account be said to be defective. Here Descartes refers to the method of cutting lenses described in Discourse 10 of the Optics. †1 For much skill and practice are needed for making and adjusting the machines I have described, and although my description does not omit any details, I should be no less astonished if they succeeded at the first attempt than if someone could learn to play the lute excellently in a single day simply by being given a good fingering chart. And if I am writing in French, my native language, rather than Latin, the language of my teachers, it is because I expect that those who use only their natural reason in all its purity will be better judges of my opinions than those who give credence only to the writings of the ancients. As to those who combine good sense with application - the only judges I wish to have - I am sure they will not be so partial to Latin that they will refuse to listen to my arguments because I expound them in the vernacular.

For the rest, I do not wish to speak here in detail about the further progress I hope to make in the sciences, or to commit myself in the eyes of the public by making any promise that I am not sure of fulfilling. I will say only that I have resolved to devote the rest of my life to nothing other than trying to acquire some knowledge of nature from which we may derive rules in

medicine which are more reliable than those we have had up till now. Moreover, my inclination makes me so strongly opposed to all other projects, and especially to those which can be useful to some persons only by harming others, that if circumstances forced me to engage in any such pursuit, I do not think I would be capable of succeeding in it. Of this I make here a public declaration, fully recognizing that it cannot serve to make me eminent in the world; but then I have no desire to be such. And I shall always hold myself more obliged to those by whose favour I enjoy uninterrupted leisure than to any who might offer me the most honourable positions in the world.