What Kind of Subjects are Worth Investigating?

Selections from Rules for the Direction of the Mind

Rene Descartes

In this text, Descartes outlines several of his rules for rigorous thinking. The two principal questions that he seeks to answer are 1) what kind of things deserve the attention of rigorous and extended thinking and 2) on what topics can we obtain certainty? Descartes' claims about what objects are worthy of attention and why they are worthy of attention stand in fairly stark contrast to the underlying mindset behind exploration-based curricula of the 21st century.

Rule I

The aim of our studies should be to direct the mind with a view to forming true and sound judgments about whatever comes before it.

Whenever men notice some similarity between two things, they are wont to ascribe to each, even in those respects in which the two differ, what they have found to be true of the other. Thus they erroneously compare the sciences, which entirely consists in the cognitive exercise of the mind, with the arts, which depend upon an exercise and disposition of the body. They see that not all the arts can be acquired by the same man, but that he who restricts himself to one, most readily becomes the best executant, since it is not so easy for the same hand to adapt itself both to agricultural operations and to harp-playing, or to the performance of several such tasks as to one alone.

> ### Reflection Question
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> Does this distinction hold based on your understanding of the sciences and the arts?

Rule II

We should attend only to those objects of which our minds seem capable of having certain and indubitable cognition.

Science in its entirety is true and evident cognition. He is no more learned who has doubts on many matters than the man who has never thought of them; nay he appears to be less learned if he has formed wrong opinions on any particulars. Hence it were better not to study at all than to occupy one's self with objects of such difficulty, that, owing to our inability to distinguish true from false, we are forced to regard the doubtful as certain; for in those matters, any hope of augmenting our knowledge is exceeded by the risk of diminishing it. Thus in accordance with the above maxim we reject all such merely probable knowledge and make it a rule to trust only what is completely known and incapable of being doubted. No doubt men of education may persuade themselves that there is but little of such certain knowledge, because, forsooth, a common failing of human nature has made them deem it too easy and open to everyone, and so led them to neglect to think upon such truths; but I nevertheless announce that there are more of these than they think -- truths which suffice to give a rigorous demonstration of innumerable propositions, the discussion of which they have hitherto been unable to free from the element of probability. Further, because they have believed that it was unbecoming for a man of education to confess ignorance on any point, they have so accustomed themselves to trick out their fabricated explanations, that they have ended by gradually imposing on themselves and thus have issued them to the public as genuine.

But if we adhere closely to this rule we shall find left but few objects of legitimate study. For there is scarce any question occurring in the sciences about which talented men have not disagreed. But whenever two men come to opposite decisions about the same matter one of them at least must certainly be in the wrong, and apparently there is not even one of them who knows; for if the reasoning of the second were sound and clear he would be able so to lay it before the other to succeed in convincing his understanding also. Hence apparently we cannot attain to a perfect knowledge in any such case of probable opinion, for it would be rashness to hope for more than others have attained to. Consequently if we reckon correctly, of the sciences already discovered, Arithmetic and Geometry alone are left, to which the observance of this rule reduces us.

Reflection question

Descartes' reasoning has guided him to two objects that are worth studying. Does his reasoning seem sound or not and why?

Yet we do not therefore condemn that method of philosophizing which others have already discovered, and those weapons of the schoolmen, probable syllogisms, which are so well suited for polemics. They indeed give practice to the

wits of youth and, producing emulation among them, act as a stimulus; and it is much better for their minds to be moulded by opinions of this sort, uncertain though they appear, as being objects of controversy amongst the learned, than to be left entirely to their own devices. For thus through lack of guidance they might stray into some abyss, but as long as they follow in their masters' footsteps, though they may diverge at times from the truth, they will yet certainly find a path which is at least in this respect safer, that it has been approved by more prudent people. We ourselves rejoice that we in earlier years experienced this scholastic training; but now, being released from that oath of allegiance which bound us to our old masters and since, as become our riper years, we are no longer subject to the ferule, if we wish in earnest to establish for ourselves those rules which shall aid us in scaling the heights of human knowledge, we must admit assuredly among the primary members of our catalogue that maxim which forbids us to abuse our leisure as many do, who neglect all easy quests and take up their time only with difficult matters; for they, though certainly making all sorts of subtle conjectures and elaborating most plausible arguments with great ingenuity, frequently find too late that after all their labours they have only increased the multitude of their doubts, without acquiring any knowledge whatsoever.

But now let us proceed to explain more carefully our reason for saying, as we did a little while ago, that of all the sciences known as yet, Arithmetic and Geometry alone are free from any taint of falsity or uncertainty. We must note then that there are two ways by which we arrive at the knowledge of facts, viz. by experience and by deduction. We must further observe that while our inferences from experience are frequently fallacious, deduction, or the pure illation of one thing from another, though it may be passed over, if it is not seen through, cannot be erroneous when performed by an understanding that is in the least degree rational. And it seems to me that the operation is profited but little by those constraining bonds by means of which the Dialecticians claim to control human reason, though I do not deny that that discipline may be serviceable for other purposes. My reason for saying so is that none of the mistakes which men can make (men, I say, not beasts) are due to faulty inference; they are caused merely by the fact that we found upon a basis of poorly comprehended experiences, or that propositions are posited which are hasty and groundless.

Reflection Question

Is it true that reason cannot lead to error?

This furnishes us with an evident explanation of the great superiority in certitude of arithmetic and Geometry to other sciences. The former alone deal with an object so pure and uncomplicated, that they need make no assumptions at all which experience renders uncertain, but wholly consist in the rational deduction of consequences. They are on that account much the easiest and clearest of all, and possess an object such as we require, for in them it is scarce humanly possible for anyone to err except by inadvertence. And yet we should not be surprised to find that plenty of people of their own accord prefer to apply their intelligence to other studies, or to Philosophy. The reason for this is that every person permits himself the liberty of making guesses in the matter of an obscure subject with more confidence than in one which is clear, and that it is much easier to have some vague notion about any subject, no matter what, than to arrive at the real truth about a single question however simple that may be.

But one conclusion now emerges out of these considerations, viz. not, indeed, that Arithmetic and Geometry are the sole sciences to be studied, but only that in our search for the direct road towards truth we should busy ourselves with no object about which we cannot attain a certitude equal to that of the demonstrations of Arithmetic and Geometry.

Rule III

Concerning objects proposed for study, we ought to investigate what we can clearly and evidently intuit or deduce with certainty, and not what other people have thought or what we ourselves conjecture. For knowledge can be attained in no other way.

We must read the works of the ancients; for it is an extraordinary advantage to have available the labors of so many men, both in order to recognize what true discoveries have already long since been made and -also to become aware of what scope is still left for invention in the various disciplines. There is, however; at the same time a great danger that perhaps some contagion of error, contracted from a too attentive reading of them, may stick to us against our will, in spite of all precautions. For authors are ordinarily so disposed that whenever their heedless credulity has led them to a decision on some controverted opinion, they always try to bring us over to the same side, with the subtlest arguments; if on the other hand they have been fortunate enough to discover something certain and evident, they never set it forth without wrapping it up in all sorts of complications. (I suppose they are afraid that a simple account may lessen the importance they gain by the discovery; or perhaps they begrudge us the plain truth.)

Reflection Question

Descartes and Montaigne raise similar questions with respect to the works of the ancients. What kind of authority should time-honored wisdom be given? Does it have an epistemic value of its own?

But in fact, even if all writers were honest and plain; even if they never passed off matters of doubt upon us as if they were truths, but set forth everything in good faith; nevertheless, since there is hardly anything that one of them says but someone else asserts the contrary, we should be continually uncertain which side to believe. It would be no good to count heads, and then follow the opinion that has most authorities for it; for if the question that arises is a difficult one, it is more credible that the truth of the matter may have been discovered by few men than by many. But even if all agreed together, it would not be enough to have their teachings. For we shall never be mathematicians, say, even if we retain in memory all the proofs others have given, unless we ourselves have the mental aptitude of solving any given problem; we shall never be philosophers, if we have read all the arguments of Plato and Aristotle but cannot form a solid judgment on matters set before us; this sort of learning would appear historical rather than scientific. Further, this Rule counsels us against ever mixing up any conjectures with our judgments as to the truth of things. It is of no small importance to observe this; for the chief reason why in the common philosophy there is nothing to be found whose certitude is so apparent as to be beyond controversy is that those who practice it have not begun by contenting themselves with the recognition of what is clear and certain, but have ventured on the further assertion of what was obscure and unknown and was arrived at only through probable conjectures. These assertions they have later on themselves gradually come to hold with complete confidence, and have mixed them up indiscriminately with evident truths; and the final result was their inability to draw any conclusion that did not seem to depend on some such proposition, and consequently to draw any that was not uncertain.

In order to avoid our subsequently falling into the same error, the Rule enumerates all the intellectual activities by means of which we can attain to knowledge of things without any fear of deception; it allows of only two such intuition and induction. By intuition I mean, not the wavering assurance of the senses, or the deceitful judgment of a misconstructed imagination, but a conception, formed by unclouded mental attention, so easy and distinct as to leave no room for doubt in regard to the thing we are understanding. It comes to the same thing if we say: It is an indubitable conception formed by an unclouded mental mind; one that originates solely from the light of reason, and is more certain even than

deduction, because it is simpler (though, as we have previously noted, deduction, too, cannot go wrong if it is a human being that performs it). Thus, anybody can see by mental intuition that he himself exists, that he thinks, that a triangle is bounded by just three lines, and a globe by a single surface, and so on; there are far more of such truths than most people observe, because they disdain to turn their mind to such easy topics.

Some people may perhaps be troubled by this new use of the word intuition, and of other words that I shall later on be obliged to shift away from their common meaning. So I give at this point the general warning that I am not in the least thinking of the usage of particular words that has prevailed in the Schools in modern times, since it would be most difficult to use the same terms while holding quite different views; I take into account only what a given word means in Latin, in order that, whenever there are no proper words for what I mean, I may transfer to that meaning the words that seem to me most suitable. The evidentness and certainty of intuition is, moreover, necessary not only in forming propositions but also for any inferences. For example, take the inference that 2 and 2 come to the same as 3 and 1; intuition must show us not only that 2 and 2 make 4, and that 3 and 1 also make 4, but furthermore that the above third proposition is a necessary conclusion from these two.

This may raise a doubt as to our reason for having added another mode of knowledge, besides intuition, in this Rule - namely, knowledge by deduction. (By this term I mean any necessary conclusion from other things known with certainty.) We had to do this because many things are known although not self-evident, so long as they are deduced from principles known to be true by a continuous and uninterrupted movement of thought, with clear intuition of each point. It is in the same way that we know the last link of a long chain is connected with the first, even though we do not view in a single glance (Intuitu) all the intermediate links on which the connexion depends; we need only to have gone through the links in succession and to remember that from the first to the last each is joined to the next. Thus we distinguish at this point between intuition and certain deduction'; because the latter, unlike the former, is conceived as involving a movement or succession; and is again unlike intuition in not requiring something evident at the moment, but rather, so to say, borrowing its certainty from memory. From this we may gather that when propositions are direct conclusions from first principles, they may be said to be known by intuition or by deduction, according to different ways of looking at them; but first principles themselves may be said to be known only by intuition; and remote conclusions, on the other hand, only by deduction.

Reflection Question

Does the advent of new fields of study like [non-euclidian geometry](#) undermine any of Descrates' claims in this piece?

These are the two most certain ways to knowledge; and on the side of the mind no more must be admitted; all others must be rejected as suspect and liable to mislead.

Reflection Question

In the end, did Descartes provide good evidence for his claims about what objects are worthy of study? Why or why not?

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