Near the beginning of the *Discourse on Method*, after reviewing the mass of obscurity and confusion bequeathed to him by the schools of his day, Descartes imagines the possibility of starting his intellectual life completely afresh. He compares the state of learning to an ancient city, which had begun as a small village, and which was gradually overlaid with roads going every which way, and buildings half tumbling down but rebuilt and modified by many different hands. He imagines instead a well ordered city, conceived by a single architect and built all at one time on a perfectly flat plain with straight streets marking off rectangular blocks. (*Discourse*, Part II).

How could such a city of learning be built? Descartes' response is sketched more clearly in his earlier *Rules for the Direction of the Mind* than it is in the *Discourse* itself. Among the Rules, two seem perfectly sensible:

Only those objects should engage our attention, to the sure and indubitable knowledge of which our mental powers seem to be adequate (Rule II).

There is need of a method for finding out the truth (Rule IV).

(Haldane and Ross translation, Dover Press, 1955)

As Descartes says, why not confine our inquiries to those subjects we can genuinely understand? And should there not then be a method, a road, a technique to follow so that we could distinguish which inquiries would be fruitful from those which would not?

Again and again these questions have been repeated at the outset of philosophical inquiries over the past 350 years since Descartes wrote. Again and again philosophers have found it necessary to write, as the logically first step in their philosophical labors, and sometimes also as the chronologically first step, some account of human mental powers.


Consider also that in many colleges and universities, over a very long period of time, it was thought necessary to begin one's studies with a course in logic, and sometimes also with a course in what has been called “epistemology”, or “theory of knowledge”.

Hume can be taken as a representative spokesman for much of this tradition. Like Descartes, he calls attention to “the imperfect condition of the sciences” and says that “disputes are multiplied, as if everything was uncertain; and these disputes are managed with the greatest warmth, as if everything was certain” (*Treatise*, Introduction [Oxford, 1955, p. XVII–XVIII]). He first suggests,

'Tis impossible to tell what changes and improvements we might make in these sciences were we thoroughly acquainted with the extent and force of human understanding, and could explain the nature of the ideas we employ, and of the operations we perform in our reasonings (p. XIX).

But then a page later he more definitely asserts,
There is no question of importance, whose decision is not comprised in the science of man; and there is none, which can be decided with any certainty, before we become acquainted with that science. In pretending therefore to explain the principles of human nature, we in effect propose a complete system of the sciences, built on a foundation almost entirely new, and the only one upon which they can stand with any security (p. XX).

To return to Descartes, what sort of method does Descartes propose to overcome the confusion and obscurity propagated by the schools? Descartes finds the clarity and order he seeks in only two of the established disciplines, namely arithmetic and geometry. These then provide the model of inquiry.

...not, indeed, that Arithmetic and Geometry are the sole sciences to be studied, but 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 (The Rules, Rule II).

Descartes' proposed expansion of arithmetic and geometry has in fact occurred. The sciences we know as physics and chemistry, and to a growing extent biology, result from the application of mathematics to physical things. Wherever anything can be described in terms of numbers and geometrical figures, then arithmetical and geometrical inferences can be made. Two plus two equals four is as valid when applied to atoms as it is when applied to elephants. The only question is about our initial application of number and geometrical shape to those physical things. Do we in fact have two atoms plus two atoms, or two elephants plus two elephants? And there is a further question. Should we inquire about what our mathematics cannot reach? Might there be something about atoms and elephants not expressed by two plus two? Might there be things to which numbers and geometrical shapes don't apply at all?

Hume's line of attack on the confusion and obscurity of the schools is quite different from Descartes'. The opening paragraph of A Treatise of Human Nature is as follows:

All the perceptions of the human mind resolve themselves into two distinct kinds, which I shall call Impressions and Ideas. The difference betwixt these consists in the degrees of force and liveliness with which they strike upon the mind, and make their way into our thought or consciousness. Those perceptions, which enter with most force or violence, we may name impressions; and under this name I comprehend all our sensations, passions and emotions, as they make their first appearance in the soul. By ideas I mean the faint images of these in thinking and reasoning... (Treatise, I, I, I, p. 1).

The important claim here, as Hume makes explicit a few pages later, is that impressions and ideas "differ only in degree". His example is "red" and he speaks of the impression of red "which strikes our eyes in sunshine" as compared to the idea of red "which we form in the dark" (p. 3). He seems clearly to have in mind a mental image of red, like an immediate after-image which follows a particularly strong sensation, or a mental picture of red, such as a dream image. But he asserts as a fact of observation that all our ideas are of this sort, and he claims that "Everyone may satisfy himself in this point by running over as many [ideas] as he pleases." He challenges anyone to produce an idea which does not correspond to a sense impression from which it differs only in degree (pp. 3-4).

Once again, let me repeat, Hume presents the claim that impressions and ideas differ only in degree as a fact of observation. Very soon, however, this becomes a rule of exclusion. Any apparent idea which can not be traced directly to a corresponding sense impression is considered suspect and is to be explained away, for example, an idea like "substance" or "cause". In other words Hume first says there is in fact no such thing as an idea which differs in kind from a sense impression. Just examine your own ideas and you'll find that
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this is so. But then if you do find an idea which seems to differ from a sense impression, an idea like "substance" or "cause", Hume tells you that that idea is illegitimate. This is perhaps the boldest piece of circular reasoning in the history of thought. What begins as a fact of observation ends as a piece of legislation. Acceptable discourse is to be reduced to those ideas which can be traced directly to sense impressions. As Hume puts it in the final paragraph of his later essay, An Inquiry Concerning Human Understanding:

When we run over libraries, persuaded of these principles, what havoc must we make? If we take in our hand any volume—of divinity or school metaphysics, for instance—let us ask, Does it contain any abstract reasoning concerning quantity or number? No. Does it contain any experimental reasoning concerning matter and fact and existence? No. Commit it then to the flames, for it can contain nothing but sophistry and illusion.


I don't know how the proposals of Descartes and Hume strike you. To his contemporaries in the 17th century, Descartes' writings promised relief from centuries of intellectual stagnation. And while to his immediate contemporaries in the 18th century Hume's Treatise fell, as he himself later wrote "deadborn from the press" ("My Own Life", contained in the LLA edition of the Inquiry, p. 4), he is now regarded by many as the most important English speaking philosopher. Together Descartes and Hume provide the roots of the widespread contemporary view that genuine knowledge is possible only in the so-called "sciences", notably physics, chemistry, and biology, where the combination of empirical evidence and mathematical method has proved enormously fruitful, and in the so-called "social sciences", to the extent that they can successfully imitate the techniques of the physical sciences. That is, the effect is to restrict inquiry, and in particular to divert inquiry from aesthetic, moral, and religious questions except as matters of information, as for example, information about the moral and religious practices of the Trobriand Islanders or of Middletown, U.S.A. Questions about which practices are good or bad, right or wrong—questions about how we ought to live—fall outside the scope of genuine knowledge.

You freshmen will find, as the rest of us have already found, the greatest possible contrast to what I have been describing in the writings of Plato and Aristotle. As Plato presents Socrates in his "dialogues", that is, conversations, Socrates has no method of inquiry. He finds a starting point in something that is said, often in what seems an accidental way, and then proceeds to ask questions. For example, what begins as a friendly conversation with a wealthy old man proceeds to a discussion of justice and the best form of government (Republic, 328B ff.). What begins as a chance encounter in a court of law proceeds to a discussion of the gods (Euthyphro). What often proves fruitful is the careful analysis of some verse of poetry or some traditional saying, as in the examination of Protagoras' famous remark "Man is the measure of all things" (Theaetetus, 152 ff.). I believe this kind of inquiry is what Socrates means when he says in the Phaedo (99) that he can find no way to look at things themselves without blinding himself, as people do when they look directly at the sun during an eclipse, and that he must instead take refuge in speech (logoi) and examine in speech the truth of things. If this is a method of inquiry, it is the only method Socrates has.

Similarly Aristotle very often starts from what is commonly said; for example, in the Ethics, with what is said about happiness (1095a 17), or about courage (1115a 12), or from the etymology of a word, like the etymology of the word "ethics" itself (1103a 17). Even in his Physics Aristotle starts his examination into nature with the way in which people use the word "nature" and the expression "by nature", and a related expression "by chance" (192b 20 ff., 296b 13 ff.). Moreover, several of Aristotle's major works—the Physics, the De Anima, the Metaphysics—begin with collections of sayings about the subject at hand, together with a roving dialectical discussion of the problems raised.
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While Aristotle did write a series of treatises in logic, his logic is in no sense a logic of discovery, but a method for testing the validity of arguments already discovered. In the Rules for the Direction of the Mind Descartes criticizes the traditional logic on this precise grounds, that it merely articulates what we already know and does not lead to discovery of truth (Rule X). While what Descartes says is true, he is criticizing the traditional logic for not providing what it never pretended to provide. Aristotle says only that discovery of the middle terms, that is, the crucial links in reasoning, is a matter of “quick wit” (agchinoia). Aristotle gives some examples of quick wit, but no technique. (It might be useful to point out that the English word “mind” in Descartes’ Rules for the Direction of the Mind translates the Latin ingenium, a word perhaps better understood from its cognates “ingenuity”, “genius”, and “engineer” than from the word “mind”. What Descartes claims to provide is precisely rules for ingenuity, for discovery, for finding out truth. (Whether there can be such rules is another question.)

A second way of looking at Plato and Aristotle is to consider not their practice of inquiry, but their explicit talk about inquiry, about the human mind and the process of thinking. Any discussion of these matters in Plato is bound up with the term eidos, generally translated form. The word eidos derives from a verb meaning “to see”, and the root sense of the noun, already present in Homer, is “what is seen”, shape or form in the most literal sense (Iliad 21:316; Odyssey 17:308, 454).

However the seeing of shape, as modern psychologists have come more and more to realize, is not such a simple act. Somehow, given a complex of light waves striking the eye, a baby slowly learns to sort out, distinguish and identify shape. Plato calls attention to the complexity of this process when he has Socrates ask Theatetus,

> If then anyone should ask you, “By what does a man see white and black colors, and by what does he hear high and low tones?” You would, I fancy, say “By his eyes and ears” (Theatetus, 184B).

But then Socrates goes on:

> Just consider, which answer is more correct, that our eyes are that by which we see or that through which we see, and our ears that by which or that through which we hear?

Socrates’ point is that it is not our eyes which see nor our ears which hear. Rather eyes, ears, and the other senses “unite in one power, whether we should call it soul or something else” by which we see (184c). The same point is reflected in common English usage. We don’t ordinarily say that the eye sees or the ear hears. We say that the dog or the cat or the human being sees with his eyes and hears with his ears.

Thus what the mind first grasps is eidos, shape or form, and the grasping of eidos in this sense is in no way a simple act. But the word eidos extends further, to mean class, or kind, or species. When the mind grasps eidos as kind, the act is even more complex than the grasp of physical shape. It is not merely to resort to sensations again, and to distinguish once again a complex of sensations as a particular identifiable thing, as “Ma Ma” or “Da Da”. It is to grasp that “Ma Ma” is like other Ma Mas, and “Da Da” is like other Da Das, and finally that Ma Ma and Da Da have something in common and can be called by the same name, “human being”.

Notice the word “grasp” which I have used in describing this process. Unlike Plato’s visual metaphor of seeing, this is a metaphor of touching, of taking hold, of seizing with the hand. The Latinate words “apprehend” and “comprehend” both express the same metaphor of taking hold of something.

The Latin expression “concept” is even more interesting. How do you form a concept of “human being” or “dog” or “cat”? The root sense of “concept” is to “conceive” or give birth. To say that the mind must “grasp” is not enough. The mind must itself give birth to what it understands. And what
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of the English word "understand" itself? What does standing under something have to do with the mental act of understanding?

Let us return now to Hume's claim that ideas differ only in degree from sense impressions. Let us not discuss this claim with reference to difficult philosophical concepts such as "substance" and "cause", as Hume himself discusses it, but with reference to the most familiar ideas of ordinary experience, ideas like "dog" and "cat". Consider the idea of dog. Does it differ only in degree from a sense impression of a particular dog? Is it something like a mental picture of a dog? Could I ask each of you to take a few seconds to form in your mind's eye a mental picture of a dog? I assume that if each of us described our mental pictures, they would be very different, of Great Danes and Poodles, of Collies and Cocker Spaniels, and so on. But now consider the concept expressed by the word "dog". Is it merely a "less forcible and lively" version of one of these many images, or is it something different in kind which enables us all, despite the variety among our experiences of dogs, and of our mental images of dogs, to understand each other when the word "dog" is used?

One way to characterize the difference between sensation and thought is to say that sensation grasps particulars and thought grasps universals, where the universal is not simply the lowest common denominator of a group of particulars. William James gives an excellent example to make this point (Principles of Psychology, New York, 1904, Vol. II, pp. 349-50). James describes a man who regularly goes fishing with his dog. The man regularly brings along a large sponge which he uses to bail out his boat. One day he arrives at the boat and discovers that he has left the sponge behind. He makes motions of bailing out the boat, says "sponge, sponge, go fetch the sponge" and the dog goes back and gets the sponge. Does this mean that the dog has grasped a universal? No, says James. All the dog did was to associate the particular action of bailing out the boat with the particular instrument, sponge. If the dog had not been able to find the sponge, and had come back with a bucket instead, this would have shown that he grasped a universal. He would have had to bring together something common to two particular things which do not look anything alike, a bucket and a sponge, namely that both are useful for bailing out boats, and he would have had to separate this essential feature from the accidental ways in which a bucket differs from a sponge. Note that a bucket and a sponge do not look anything alike. In order to grasp what is common, one must abstract from the irrelevant differences of shape, color, size, etc., and fix on the one aspect which counts, namely that both a sponge and a bucket can be used to get water out of a boat. It is this action which I call "insight" or "seeing into". I believe it is what Plato calls attention to by the term eidos.

I do not argue here that there is an absolute distinction between animal and human intelligence and that animals are never capable of insight. I argue only that the ability to recognize universals goes well beyond the ability to identify perceived characteristics. It requires a special act of mind, and it is expressed particularly in human languages. Nothing is more impressive than observing small children as they begin to speak, as they begin to shape what James calls the blooming, buzzing confusion of sensation, and Plato calls the Heraclitean flux, a flowing indistinguishable mass.

For Plato the act of mind was so extraordinary that it could be described only in mythical terms. The form or eidos which the mind knows and which makes it possible for you and me to understand each other and to speak together must have been placed in the human mind in some previous, non-animal existence when the human soul somehow had direct access to such forms. The process of inquiry and learning is a process of dredging up from within ourselves those forms which in some way the mind already has within itself, since there is no way to understand how such forms could have arisen from the ever changing flux of sensations.

And thus we have the typical Socratic question, ti esti, what
is it? What is courage? What is justice? What is virtue? What is knowledge? And we have the typical first reply to the question what is it, the giving of examples. Instead of saying what virtue is, that is, what human excellence is, Meno replies with examples, the excellence of a man, the excellence of a woman, the excellence of a ruler, the excellence of a servant. But this is not what Socrates wants. Rather he seeks that which is common to all these examples so that they can all be called by the same name, the form or *eidos* of virtue (Meno 72C, 74D–E).

Socrates actually gives very few examples of successful answers to the question, what is it? One is the definition of figure, that is figure in the sense of triangle or square, mathematical figure. Figure, he says, is that which always follows color (Meno, 75B). Socrates pretends to Meno that it would be easy to define the insect bee, to say what is common to all bees and to no other creatures (72A). However I think Socrates knows, and Plato knows, that being able to recognize a bee or a dog or a cat is very different from being able to say in so many words what is common to all bees or dogs or cats. Even such apparently simple cases are very difficult, and cases like virtue or knowledge are even more difficult. Most of the dialogues end in frustration, forcing us to reflect more carefully on what we think and what we say, but rarely providing us with answers to the question, what is it? Perhaps the one successful case is the definition of justice in the *Republic* (433A): justice is minding one’s own business. But then we need a dialogue of several hundred pages to properly understand what the definition means. I believe the implication of such dialogues is that most of us most of the time can see more than we can say. The metaphor of *eidos* is a metaphor of seeing, but to go beyond seeing to saying is another task indeed.

The important exception is mathematics. It is possible to say precisely what a triangle is, a closed figure composed of three straight lines. This definition includes all triangles and excludes anything not a triangle. It is even possible to say what “same ratio” is in a way which includes all cases of same ratio and excludes all cases not of same ratio. But it is far more difficult to provide such definitions anywhere except in the mathematical sciences and in artificially constructed games, such as chess, where definitions of pieces and formulations of rules can be precisely stated. It is this very fact which makes government by written laws so extraordinarily complex. Laws steadily proliferate in the attempt to explicitly state the rights and obligations of citizens, but there is no end in sight to conflicting interpretations.

You will remember that Descartes proposed geometry and arithmetic as a model for all human thought. While Descartes’ model does not trivialize the act of mind as Hume tried to do, while it does not reduce it to something subhuman, it proposes instead a standard of achievement which might be called superhuman. It calls for clarity and distinctness which may be attainable in only a small part of our speech, but it proposes that we refuse to think about anything in which we cannot attain such clarity and distinctness. Before we begin to inquire, limits are set. Descartes and Hume argue for limits from opposite directions, but the effect is the same: to narrow inquiry so that it fits rules prescribed in advance.

In his own account of sensation, Aristotle begins by generalizing the Platonic term *eidos* from the metaphor of seeing to whatever is perceived through any sense organ, referring to it as *eidos aistheton*, “sensed form” or “sensory form” (*De Anima* II, 12, 424a 19). So to speak, we not only see shape but in some extended sense we hear shape, smell shape, taste shape, and touch shape. Furthermore, Aristotle asserts that *eidos* as received by the mind must somehow have its roots in *eidos* as received by the senses. Thinking must somehow be a process of receiving something from outside the mind itself, and therefore somehow analogous to sensation (*De Anima*, III, 4, 429a 13–17). Aristotle even stresses the close relation between thought and sensation by arguing that even when it deals with the most abstract thoughts, the mind never func-
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ions without an accompanying mental image (431a 14–16, 432a 3–8).

On the other hand when Aristotle tries to say how the eidos of mind is derived from sensation, he is reduced to metaphor. In fact he offers three different metaphors in three different places in his writings. The most elaborate is in the final chapter of the Posterior Analytics. Speaking of the origins of the arts and sciences, he says,

We conclude that these states of knowledge are neither innate in a determinate form, nor developed from other higher states of knowledge, but from sense perception. It is like a rout in battle stopped by first one man making a stand and then another, until the original formation has been restored. The soul is so constituted as to be capable of this process.

... When one of a number of (logically) indiscriminable particulars has made a stand, the earliest universal is present in the soul: for though the act of sense perception is of the particular, its (content) is universal—is man, for example, not the man Callias. A fresh stand is made among these (rudimentary universals), and the process does not cease until the indivisible (concepts), the true universals, are established: e.g. such and such a (species) of animal is a step toward the genus animal, which by the same process is a step toward a further generalization.

(Post Anal., II, 19, 100a0–b2, the Mure translation as reprinted in the McKeon edition, New York, 1941. I have put in parentheses some of the words not explicit in the Greek.)

The blooming, buzzing confusion of sensation is like a retreat in battle with soldiers running every which way. Somehow one soldier makes a stand. Then another, then another. And out of the confusion comes a kind of order, a kind of formation, or form.

Aristotle’s second metaphor is contained in Book III, chapter 5 of the De Anima, where he tries to describe the active power of mind as compared to its receiving power. He says the active power of mind is something like light, which makes potential colors into actual colors (430a 17). Just as colors are in some sense present in the dark but cannot be seen without light, so what the mind grasps is somehow present in particular things but cannot be found until the mind itself shines on those things.

The third metaphor is the most obscure. In De Anima III, 4, after saying that the mind knows what things are whereas the senses know only particular instances of things, Aristotle says that the mind is either entirely separate from the sensitive faculty “or related to it as a bent line to the same line when it has been straightened out” (429b, the Smith translation as reprinted in the McKeon edition). I can’t get much further help from this metaphor. All I can suggest is that the receptivity of mind somehow draws on and draws out of the receptivity of the senses. Somehow what the mind knows comes from the senses but goes beyond what the senses can provide.

What we have been describing so far corresponds at least roughly to what can be expressed in single words, man, dog, white, black, etc. Aristotle now goes on to distinguish a second act of mind, the combining of the simple objects of thought in an affirmation, such as this dog is white, or the separating of the simple objects of thought in a negation, as in this dog is not white. The second act of mind corresponds to what can be expressed in sentences. In English as in its Latin root, the word “sentence” has a legal meaning, namely a formal, authoritative decision by a judge or a court. Any English sentence, or at least what are called “declarative” sentences, has fundamentally the same force, a decision by a speaker, a spokesman, a spokesman who speaks for himself if for no one else that something is so or not so. It is only with sentences that the possibility of truth and falsity arises. Single words are neither true nor false. It is only when words are put together in combinations, such as this dog is white, that dog is black, that we have uttered a statement which can be either true or false. (See De Anima III, 6 and De Interpretatione, 1. See also Plato’s Sophist 262–3.) I believe this is part of what Socrates means in the Theaetetus (186C) when he says that in order to
reach truth, one must first reach being. One has to say such things as “this dog is white”, “dogs are mammals”, “mammals are animals”. Unless one says that something is or is not, either explicitly or implicitly, one cannot utter either truth or falsity.

But I believe that Socrates means something further, namely that in the simplest act of mind and in the simplest assertion, there are already contained the seeds of inquiry into being itself, what Aristotle was later to call “first philosophy”, philosophy in the most profound sense, the inquiry into being as being (Metaphysics VI, 1).

Combinations of words are called in Greek logos. (See De Int., 4, 16b 27). The same word logos in Greek also means ratio. A ratio is a relation between magnitudes named separately, the relation of 2 to 3, 3 to 4, etc. Similarly, speech establishes relations between objects named separately, this dog is white, that dog is black, etc. Whatever the human mind can grasp directly, it seems to be able to express only in combinations of words.

The word logos thus brings us back around to what Socrates says in the Phaedo (99E), that he could not look at things directly without blinding himself, but had to take refuge in logos, in sentences, in what is said. It also points to the definition of “knowledge” in the Theaetetus, as true opinion with logos (201c). The Theaetetus attempts at great length to answer the question, what is knowledge, but the definition proposed seems utterly empty, knowledge is true opinion with logos. What does it mean to know something? First of all what one knows couldn’t be false, so we can say that knowledge has to at least be true. Knowledge therefore is true opinion. But couldn’t one have an opinion that’s true without really knowing that it’s true? For example, couldn’t I think correctly that someone is guilty of a crime without really knowing that he’s guilty? So how do I distinguish knowing something from merely having a true opinion about it? The definition proposed is that knowledge is true opinion with logos. All efforts fail when Socrates and Theaetetus go on to attempt to say more precisely what sort of logos that might be, but I’m not sure that the definition itself is bad, or rather, to put it another way, the definition may be the best we can offer. Knowledge is true opinion with logos, that is, true opinion with speech, opinion you can say something about, opinion you can argue, and articulate, and explain. Only the talk can decide, to the extent that we can ever decide, which opinions are worse and which are better, and perhaps finally which are false and which are true.

This is the task we share. Some of you are just arriving in this College, some of us have spent the greatest part of our adult lives here. But for all of us it is a task which began with the learning of our native languages, as we tried to sort out and arrange elements from the utter confusion of sense experience. For all of us the task is to be true to the search itself, neither to prescribe its method in advance nor to set bounds in advance to its possible scope.

Something further is also required, a kind of passion, a passion to see, a passion to hear, perhaps even a passion to say. The trick is to combine passion with an open mind. John Donne, writing in the midst of the religious wars of the sixteenth century, when Catholics were murdering Protestants and Protestants were murdering Catholics, in no way gave up the passion of his own Christian belief. He wrote some of the most strongly felt religious poetry in our language. On the other hand when Donne stood back and thought about the carnage around him, in the poem called Satyre: Of Religion, he could write as follows (lines 77-82):

... doubt wisely; in strange way  
To stand inquiring right, is not to stray;  
To sleepe, or runne wrong, is. On a huge hill,  
Cragged, and steep, Truth stands, and hee that will  
Reach her, about must, and about must goe;  
And what the hills suddennes resists, winne so . . .