Hamilton, Huntington, Cairns
Collected Dialogues of Plato
Princeton U.P. 1985

# Selections from Plato's Dialogues on Mathematics

Russell Marcus



## from Timaeus

First then, in my judgment, we must make a distinction and ask, What is that which always is and has no becoming, and what is that which is always becoming and never is? That which is apprehended by intelligence and reason is always in the same state, but that which is conceived by opinion with the help of sensation and without 28
reason is always in a process of becoming and perishing and never really is. Now everything that becomes or is created must of necessity be created by some cause, for without a cause nothing can be created. The work of the creator, whenever he looks to the unchangeable and fashions the form and nature of his work after an unchangeable pattern, must necessarily be made fair and perfect, but when he looks b
to the created only and uses a created pattern, it is not fair or perfect. Was the heaven then or the world, whether called by this or by any other more appropriate name—assuming the name, I am asking a question which has to be asked at the beginning of an inquiry about anything—was the world, I say, always in existence and without beginning, or created, and had it a beginning? Created, I reply, being visible and tangible and having a body, and therefore sensible, and all sensible things are apprehended by opinion and sense, and are in a c
process of creation and created. Now that which is created must, as we affirm, of necessity be created by a cause. But the father and maker of all this universe is past finding out, and even if we found him, to tell of him to all men would be impossible. This question, however, we must ask about the world. Which of the patterns had the artificer in view when he made it—the pattern of the unchangeable or of that which is created? If the world be indeed fair and the artificer good, it is manifest that he must have looked to that which is eternal, but if what cannot be said without blasphemy is true, then to the created pattern. Everyone will see that he must have looked to the eternal, for the world is the fairest of creations and he is the best of causes. And having been created in this way, the world has been framed in the likeness of that which is apprehended by reason and mind and is unchangeable, and must therefore of necessity, if this is admitted, be a copy of something. Now it is all-important that the beginning of everything should be according to nature. And in speaking of the copy and the original we may assume that words are akin to the matter which they describe; when they relate to the lasting and permanent and intelligible, they ought to be lasting and unalterable, and, as far as their nature allows, irrefutable and invincible—nothing less. But when they express only the copy or likeness and not the eternal things themselves, they need only be likely and analogous to the former words. As being is to becoming, so is truth to belief. If then, Socrates, amidst the many opinions about the gods and the generation of the universe, we are not able to give notions which are altogether and in every respect exact and consistent with one another, do not be surprised. Enough if we adduce probabilities as likely as any others, for we must remember that I who am the speaker and you who are the judges are only mortal men, and we ought to accept the tale which is probable and inquire no further.

from PHAEDO

100

Well, said Socrates, what I mean is this, and there is nothing new b
about it. I have always said it; in fact I have never stopped saying it, especially in the earlier part of this discussion. As I am going to try to explain to you the theory of causation which I have worked out myself, I propose to make a fresh start from those principles of mine which you know so well—that is, I am assuming the existence of absolute beauty and goodness and magnitude and all the rest of them. If you grant my assumption and admit that they exist, I hope with their help to explain causation to you, and to find a proof that soul is immortal.

Certainly I grant it, said Cebes. You need lose no time in draw- c
ing your conclusion.

Then consider the next step, and see whether you share my opinion. It seems to me that whatever else is beautiful apart from absolute beauty is beautiful because it partakes of that absolute beauty, and for no other reason. Do you accept this kind of causality?

Yes, I do.

Well, now, that is as far as my mind goes; I cannot understand these other ingenious theories of causation. If someone tells me that the reason why a given object is beautiful is that it has a gorgeous d
color or shape or any other such attribute, I disregard all these other explanations—I find them all confusing—and I cling simply and straightforwardly and no doubt foolishly to the explanation that the one thing that makes that object beautiful is the presence in it or association with it, in whatever way the relation comes about, of absolute beauty. I do not go so far as to insist upon the precise details —only upon the fact that it is by beauty that beautiful things are beautiful. This, I feel, is the safest answer for me or for anyone else to give, and I believe that while I hold fast to this I cannot fall; it is safe
e for me or for anyone else to answer that it is by beauty that beautiful things are beautiful. Don't you agree?

Yes, I do.

Then is it also by largeness that large things are large and larger things larger, and by smallness that smaller things are smaller?

Yes.

So you too, like myself, would refuse to accept the statement that one man is taller than another 'by a head,' and that the shorter man is shorter by the same. You would protest that the only view
101 which you yourself can hold is that whatever is taller than something else is so simply by tallness—that is, because of tallness—and that what is shorter is so simply by shortness, that is, because of shortness. You would be afraid, I suppose, that if you said that one man is taller than another by a head, you would be faced by a logical objection—first that the taller should be taller and the shorter shorter by the same thing, and secondly that the taller person should be taller by a head, which is a short thing, and that it is unnatural that
b a man should be made tall by something short. Isn't that so?

Cebes laughed and said, Yes, it is.

Then you would be afraid to say that ten is more than eight 'by two,' or that two is the cause of its excess over eight, instead of saying that it is more than eight by, or because of, being a larger number, and you would be afraid to say that a length of two feet is greater than one foot by a half, instead of saying that it is greater by its larger size—because there is the same danger here too?

Quite so.

Suppose next that we add one to one. You would surely avoid say-
c ing that the cause of our getting two is the addition, or in the case of a divided unit, the division. You would loudly proclaim that you know of no other way in which any given object can come into being except by participation in the reality peculiar to its appropriate universal, and that in the cases which I have mentioned you recognize no other cause for the coming into being of two than participation in duality, and that whatever is to become two must participate in this, and whatever is to become one must participate in unity. You would dismiss these divisions and additions and other such niceties, leaving them for persons wiser than yourself to use in their explanations,
d while you, being nervous of your own shadow, as the saying is, and of your inexperience, would hold fast to the security of your hypothesis and make your answers accordingly. If anyone should fasten upon the hypothesis itself, you would disregard him and refuse to answer until you could consider whether its consequences were mutually consistent or not. And when you had to substantiate the hypothesis itself, you would proceed in the same way, assuming whatever more ultimate hypothesis commended itself most to you, until you reached one which was satisfactory. You would not mix the two things together e
by discussing both the principle and its consequences, like one of these destructive critics—that is, if you wanted to discover any part of the truth. They presumably have no concern or care whatever for such an object, because their cleverness enables them to muddle everything up without disturbing their own self-complacence, but you, I imagine, if you are a philosopher, will follow the course which I describe. 102

You are perfectly right, said Simmias and Cebes together.

ECHECRATES: I can assure you, Phaedo, I am not surprised. It seems to me that Socrates made his meaning extraordinarily clear to even a limited intelligence.

PHAEDO: That was certainly the feeling of all of us who were present, Echecrates.

ECHECRATES: No doubt, because it is just the same with us who were not present and are hearing it now for the first time. But how did the discussion go on?

PHAEDO: I think that when Socrates had got this accepted, and it was agreed that the various forms exist, and that the reason why b
other things are called after the forms is that they participate in the forms, he next went on to ask, If you hold this view, I suppose that when you say that Simmias is taller than Socrates but shorter than Phaedo, you mean that at that moment there are in Simmias both tallness and shortness?

Yes, I do.

SELECTIONS from PLATO on MATHEMATICS D2

But do you agree that the statement 'Simmias is bigger than Socrates' is not true in the form in which it is expressed? Surely the real reason why Simmias is bigger is not because he is Simmias but because of the height which he incidentally possesses, and conversely c
the reason why he is bigger than Socrates is not because Socrates is Socrates, but because Socrates has the attribute of shortness in comparison with Simmias' height.

True.

And again Simmias' being smaller than Phaedo is due not to the fact that Phaedo is Phaedo, but to the fact that Phaedo has the attribute of tallness in comparison with Simmias' shortness.

Quite so.

So that is how Simmias comes to be described as both short and tall, because he is intermediate between the two of them, and allows his shortness to be surpassed by the tallness of the one while he as- d
serts his superior tallness over the shortness of the other.

He added with a smile, I seem to be developing an artificial style, but the facts are surely as I say.

Simmias agreed.

I am saying all this because I want you to share my point of view. It seems to me not only that the form of tallness itself absolutely declines to be short as well as tall, but also that the tallness which is in us never admits smallness and declines to be surpassed. It does one of two things. Either it gives way and withdraws as its opposite shortness
e approaches, or it has already ceased to exist by the time that the other arrives. It cannot stand its ground and receive the quality of shortness in the same way as I myself have done. If it did, it would become different from what it was before, whereas I have not lost my identity by acquiring the quality of shortness—I am the same man, only short —but my tallness could not endure to be short instead of tall. In the same way the shortness that is in us declines ever to become or be tall, nor will any other quality, while still remaining what it was, at
103 the same time become or be the opposite quality; in such a situation it either withdraws or ceases to exist.

I agree with you entirely, said Cebes.

At this point one of the company—I can't remember distinctly who it was—said, Look here! Didn't we agree, earlier in the discussion, on the exact opposite of what you are saying now—that the bigger comes from the smaller and the smaller from the bigger, and that it is precisely from their opposites that opposites come? Now the view seems to be that this is impossible.

Socrates had listened with his head turned toward the speaker. It was brave of you to refresh my memory, he said, but you don't realize
b the difference between what we are saying now and what we said then. Then we were saying that opposite *things* come from opposite *things;* now we are saying that the opposite *itself* can never become opposite to *itself*—neither the opposite which is in us nor that which is in the real world. Then, my friend, we were speaking about objects which possess opposite qualities, and calling them by the names of the latter, but now we are speaking about the qualities themselves, from whose presence in them the objects which are called after them
c derive their names. We maintain that the opposites themselves would absolutely refuse to tolerate coming into being from one another.

As he spoke he looked at Cebes. I suppose that nothing in what he said worried you too, Cebes?

No, not this time, said Cebes, though I don't deny that a good many other things do.

So we are agreed upon this as a general principle, that an opposite can never be opposite to itself.

Absolutely.

Then consider this point too, and see whether you agree about it too. Do you admit that there are such things as heat and cold?

Yes, I do.

Do you think they are the same as snow and fire?

d Certainly not.

Heat is quite distinct from fire, and cold from snow?

Yes.

But I suppose you agree, in the light of what we said before, that snow, being what it is, can never admit heat and still remain snow, just as it was before, only with the addition of heat. It must either withdraw at the approach of heat, or cease to exist.

Quite so.

Again, fire must either retire or cease to exist at the approach of cold. It will never have the courage to admit cold and still remain fire, just as it was, only with the addition of cold.

That is true. e

So we find, in certain cases like these, that the name of the form is eternally applicable not only to the form itself, but also to something else, which is not the form but invariably possesses its distinguishing characteristic. But perhaps another example will make my meaning clearer. Oddness must always be entitled to this name by which I am now calling it, isn't that so?

Certainly.

This is the question. Is it unique in this respect, or is there something else, not identical with oddness, to which we are bound always 104
to apply not only its own name but that of odd as well, because by its very nature it never loses its oddness? What I mean is illustrated by the case of the number three; there are plenty of other examples, but take the case of three. Don't you think that it must always be described not only by its own name but by that of odd, although odd and three are not the same thing? It is the very nature of three and five and all the alternate integers that every one of them is invariably odd, although it is not identical with oddness. Similarly two and four and all the rest of the other series are not identical with even, but b
each one of them always *is* even. Do you admit this, or not?

Of course I do.

Well, then, pay careful attention to the point which I want to make, which is this. It seems clear that the opposites themselves do not admit one another, but it also looks as though any things which, though not themselves opposites, always have opposites in them, similarly do not admit the opposite form to that which is in them, but on its approach either cease to exist or retire before it. Surely we must assert that three will sooner cease to exist or suffer any c
other fate than submit to become even while it is still three?

Certainly, said Cebes.

And yet two and three are not opposites.

No, they are not.

So it is not only the opposite forms that cannot face one another's approach; there are other things too which cannot face the approach of opposites.

That is quite true.

Shall we try, if we can, to define what sort of things these are?

By all means.

d Well, then, Cebes, would this describe them—that they are things which are compelled by some form which takes possession of them to assume not only its own form but invariably also that of some other form which is an opposite?

What do you mean?

Just what we were saying a minute ago. You realize, I suppose, that when the form of three takes possession of any group of objects, it compels them to be odd as well as three.

Certainly.

Then I maintain that into such a group the opposite form to the one which has this effect can never enter.

No, it cannot.

And it was the form of odd that had this effect?

Yes.

And the opposite of this is the form of even?

Yes.

e So the form of even will never enter into three.

No, never.

In other words, three is incompatible with evenness.

Quite.

So the number three is uneven.

Yes.

I proposed just now to define what sort of things they are which, although they are not themselves directly opposed to a given opposite, nevertheless do not admit it, as in the present example, three, although not the opposite of even, nevertheless does not admit it, because three is always accompanied by the opposite of even—and similarly with two and odd, or fire and cold, and hosts of others. Well, see
105 whether you accept this definition. Not only does an opposite not admit its opposite, but if anything is accompanied by a form which has an opposite, and meets that opposite, then the thing which is accompanied never admits the opposite of the form by which it is accompanied. Let me refresh your memory; there is no harm in hearing a thing several times. Five will not admit the form of even, nor will ten, which is double five, admit the form of odd. Double has an opposite of its own, but at the same time it will not admit the form of
b odd. Nor will one and a half, or other fractions such as one half or three quarters and so on, admit the form of whole. I assume that you follow me and agree.

I follow and agree perfectly, said Cebes.

## from THEAETETUS

SOCRATES: Well then, Theaetetus, here is a point for you to consider. The answer you gave was that knowledge is perception, wasn't it?

THEAETETUS: Yes.

SOCRATES: Now suppose you were asked, When a man sees white or black things or hears high or low tones, what does he see or hear with? I suppose you would say with eyes and ears.

THEAETETUS: Yes, I should.

SOCRATES: To use words and phrases in an easygoing way c without scrutinizing them too curiously is not, in general, a mark of ill breeding; on the contrary there is something lowbred in being too precise. But sometimes there is no help for it, and this is a case in which I must take exception to the form of your answer. Consider. Is it more correct to say that we see and hear *with* our eyes and ears or *through* them?

THEAETETUS: I should say we always perceive through them, rather than with them.

SOCRATES: Yes, it would surely be strange that there should be d a number of senses ensconced inside us, like the warriors in the Trojan horse, and all these things should not converge and meet in some single nature—a mind, or whatever it is to be called—*with* which we perceive all the objects of perception *through* the senses as instruments.

THEAETETUS: Yes, I think that is a better description.

SOCRATES: My object in being so precise is to know whether there is some part of ourselves, the same in all cases, with which we apprehend black or white through the eyes, and objects of other kinds e through the other senses. Can you, if the question is put to you, refer all such acts of apprehension to the body? Perhaps, however, it would be better you should speak for yourself in reply to questions, instead of my taking the words out of your mouth. Tell me, all these instruments through which you perceive what is warm or hard or light or sweet are parts of the body, aren't they, not of anything else?

THEAETETUS: Of nothing else.

SOCRATES: Now will you also agree that the objects you per- 185 ceive through one faculty cannot be perceived through another—objects of hearing, for instance, through sight, or objects of sight through hearing?

THEAETETUS: Of course I will.

SOCRATES: Then, if you have some thought about both objects at once, you cannot be having a perception including both at once through either the one or the other organ.

THEAETETUS: No.

SOCRATES: Now take sound and color. Have you not, to begin with, this thought which includes both at once—that they both *exist*?

THEAETETUS: I have.

SOCRATES: And, further, that each of the two is *different* from the other and the *same* as itself?

b THEAETETUS: Naturally.

SOCRATES: And again, that both together are *two*, and each of them is *one*?

THEAETETUS: Yes.

SOCRATES: And also you can ask yourself whether they are *unlike* each other or *alike*?

THEAETETUS: No doubt.

SOCRATES: Then through what organ do you think all this about them both? What is common to them both cannot be apprehended either through hearing or through sight. Besides, here is further evidence for my point. Suppose it were possible to inquire whether sound and color were both brackish or not; no doubt you c could tell me what faculty you would use—obviously not sight or hearing, but some other.

THEAETETUS: Of course, the faculty that works through the tongue.

SOCRATES: Very good. But now, through what organ does that faculty work, which tells you what is common not only to these objects but to all things—what you mean by the words 'exists' and 'does not exist' and the other terms applied to them in the questions I put a moment ago? What sort of organs can you mention, corresponding to all these terms, through which the perceiving part of us perceives each one of them?

THEAETETUS: You mean existence and nonexistence, likeness and unlikeness, sameness and difference, and also unity and numbers d in general as applied to them, and clearly your question covers 'even' and 'odd' and all that kind of notions. You are asking through what part of the body our mind perceives these?

SOCRATES: You follow me most admirably, Theaetetus; that is exactly my question.

THEAETETUS: Really, Socrates, I could not say, except that I think there is no special organ at all for these things, as there is for the e others. It is clear to me that the mind in itself is its own instrument for contemplating the common terms that apply to everything.

SOCRATES: In fact, Theaetetus, you are handsome, not ugly as Theodorus said you were, for in a discussion handsome is that handsome does. And you have treated me more than handsomely in saving me the trouble of a very long argument, if it is clear to you that the mind contemplates some things through its own instrumentality, others through the bodily faculties. That was indeed what I thought myself, but I wanted you to agree.

THEAETETUS: Well, it is clear to me.

SOCRATES: Under which head, then, do you place existence? 186
For that is, above all, a thing that belongs to everything.

THEAETETUS: I should put it among the things that the mind apprehends by itself.

SOCRATES: And also likeness and unlikeness and sameness and difference?

THEAETETUS: Yes.

SOCRATES: And how about 'honorable' and 'dishonorable' and 'good' and 'bad'?

THEAETETUS: Those again seem to me, above all, to be things whose being is considered, one in comparison with another, by the b mind, when it reflects within itself upon the past and the present with an eye to the future.

SOCRATES: Wait a moment. The hardness of something hard and the softness of something soft will be perceived by the mind through touch, will they not?

THEAETETUS: Yes.

SOCRATES: But their existence and the fact that they both exist, and their contrariety to one another and again the existence of this contrariety are things which the mind itself undertakes to judge for us, when it reflects upon them and compares one with another.

THEAETETUS: Certainly.

SOCRATES: Is it not true, then, that whereas all the impressions which penetrate to the mind through the body are things which men and animals alike are naturally constituted to perceive from the c moment of birth, reflections about them with respect to their existence and usefulness only come, if they come at all, with difficulty through a long and troublesome process of education?

THEAETETUS: Assuredly.

SOCRATES: Is it possible, then, to reach truth when one cannot reach existence?

THEAETETUS: It is impossible.

SOCRATES: But if a man cannot reach the truth of a thing, can he possibly know that thing?

THEAETETUS: No, Socrates, how could he? d

SOCRATES: If that is so, knowledge does not reside in the impressions, but in our reflection upon them. It is there, seemingly, and not in the impressions, that it is possible to grasp existence and truth.

THEAETETUS: Evidently.

SOCRATES: Then are you going to give the same name to two things which differ so widely?

THEAETETUS: Surely that would not be right.

SOCRATES: Well then, what name do you give to the first one—to seeing, hearing, smelling, feeling cold and feeling warm?

e THEAETETUS: Perceiving. What other name is there for it?

SOCRATES: Taking it all together, then, you call this perception?

THEAETETUS: Necessarily.

SOCRATES: A thing which, we agree, has no part in apprehending truth, since it has none in apprehending existence.

THEAETETUS: No, it has none.

SOCRATES: Nor, consequently, in knowledge either.

THEAETETUS: No.

SOCRATES: Then, Theaetetus, perception and knowledge cannot possibly be the same thing.

THEAETETUS: Evidently not, Socrates. Indeed, it is now perfectly plain that knowledge is something different from perception.

187 SOCRATES: But when we began our talk it was certainly not our object to find out what knowledge is not, but what it is. Still, we have advanced so far as to see that we must not look for it in sense perception at all, but in what goes on when the mind is occupied with things by itself, whatever name you give to that.

THEAETETUS: Well, Socrates, the name for that, I imagine, is 'making judgments.'

## from REPUBLIC, BOOK VII

507 b We predicate 'to be' of many beautiful things and many good things, saying of them severally that they *are*, and so define them in our speech.

We do.

And again, we speak of a self-beautiful and of a good that is only and merely good, and so, in the case of all the things that we then posited as many, we turn about and posit each as a single idea or aspect, assuming it to be a unity and call it that which each really is.

It is so.

And the one class of things we say can be seen but not thought, while the ideas can be thought but not seen.

By all means.

With which of the parts of ourselves, with which of our faculties, then, do we see visible things?

With sight, he said.

And do we not, I said, hear audibles with hearing, and perceive all sensibles with the other senses?

Surely.

Have you ever observed, said I, how much the greatest expenditure the creator of the senses has lavished on the faculty of seeing and being seen?

Why, no, I have not, he said.

Well, look at it thus. Do hearing and voice stand in need of another medium so that the one may hear and the other be heard, in the absence of which third element the one will not hear and the other not be heard?

They need nothing, he said.

Neither, I fancy, said I, do many others, not to say that none require anything of the sort. Or do you know of any?

Not I, he said.

But do you not observe that vision and the visible do have this further need?

How?

Though vision may be in the eyes and its possessor may try to use it, and though color be present, yet without the presence of a third thing specifically and naturally adapted to this purpose, you are aware that vision will see nothing and the colors will remain invisible. e

What is this thing of which you speak? he said.

The thing, I said, that you call light.

You say truly, he replied.

The bond, then, that yokes together visibility and the faculty of 508 sight is more precious by no slight form than that which unites the other pairs, if light is not without honor.

It surely is far from being so, he said.

Which one can you name of the divinities in heaven as the author and cause of this, whose light makes our vision see best and visible things to be seen?

Why, the one that you too and other people mean, he said, for your question evidently refers to the sun.

Is not this, then, the relation of vision to that divinity?

What?

Neither vision itself nor its vehicle, which we call the eye, is identical with the sun.

Why, no. b

But it is, I think, the most sunlike of all the instruments of sense.

By far the most.

And does it not receive the power which it possesses as an influx, as it were, dispensed from the sun?

Certainly.

Is it not also true that the sun is not vision, yet as being the cause thereof is beheld by vision itself?

That is so, he said.

This, then, you must understand that I meant by the offspring of the good which the good begot to stand in a proportion with itself. As the good is in the intelligible region to reason and the objects of reason, so is this in the visible world to vision and the objects of vision. c

How is that? he said. Explain further.

You are aware, I said, that when the eyes are no longer turned upon objects upon whose colors the light of day falls but that of the dim luminaries of night, their edge is blunted and they appear almost blind, as if pure vision did not dwell in them. d

Yes, indeed, he said.

But when, I take it, they are directed upon objects illumined by

the sun, they see clearly, and vision appears to reside in these same eyes.

Certainly.

Apply this comparison to the soul also in this way. When it is firmly fixed on the domain where truth and reality shine resplendent it apprehends and knows them and appears to possess reason, but when it inclines to that region which is mingled with darkness, the world of becoming and passing away, it opines only and its edge is blunted, and it shifts its opinions hither and thither, and again seems as if it lacked reason.

Yes, it does.

This reality, then, that gives their truth to the objects of knowledge and the power of knowing to the knower, you must say is the idea of good, and you must conceive it as being the cause of knowledge, and of truth in so far as known. Yet fair as they both are, knowledge and truth, in supposing it to be something fairer still than these you will think rightly of it. But as for knowledge and truth, even as in our illustration it is right to deem light and vision sunlike, but never to think that they are the sun, so here it is right to consider these two their counterparts, as being like the good or boniform, but to think that either of them is the good is not right. Still higher honor belongs to the possession and habit of the good.

An inconceivable beauty you speak of, he said, if it is the source of knowledge and truth, and yet itself surpasses them in beauty. For you surely cannot mean that it is pleasure.

Hush, said I, but examine the similitude of it still further in his way.

How?

The sun, I presume you will say, not only furnishes to visibles the power of visibility but it also provides for their generation and growth and nurture though it is not itself generation.

Of course not.

In like manner, then, you are to say that the objects of knowledge not only receive from the presence of the good their being known, but their very existence and essence is derived to them from it, though the good itself is not essence but still transcends essence in dignity and surpassing power.

And Glaucon very ludicrously said, Heaven save us, hyperbole can no further go.

The fault is yours, I said, for compelling me to utter my thoughts about it.

And don't desist, he said, but at least expound the similitude of the sun, if there is anything that you are omitting.

Why, certainly, I said, I am omitting a great deal.

Well, don't omit the least bit, he said.

I fancy, I said, that I shall have to pass over much, but nevertheless so far as it is at present practicable I shall not willingly leave anything out.

Do not, he said.

Conceive then, said I, as we were saying, that there are these two d
entities, and that one of them is sovereign over the intelligible order and region and the other over the world of the eyeball, not to say the sky-ball, but let that pass. You surely apprehend the two types, the visible and the intelligible.

I do.

Represent them then, as it were, by a line divided into two unequal sections and cut each section again in the same ratio—the section, that is, of the visible and that of the intelligible order—and then as an expression of the ratio of their comparative clearness and e
obscurity you will have, as one of the sections of the visible world, images. By images I mean, first, shadows, and then reflections in wa- 510
ter and on surfaces of dense, smooth, and bright texture, and everything of that kind, if you apprehend.

I do.

As the second section assume that of which this is a likeness or an image, that is, the animals about us and all plants and the whole class of objects made by man.

I so assume it, he said.

Would you be willing to say, said I, that the division in respect of reality and truth or the opposite is expressed by the proportion—as is the opinable to the knowable so is the likeness to that of which it is a likeness?

I certainly would. b

Consider then again the way in which we are to make the division of the intelligible section.

In what way?

By the distinction that there is one section of it which the soul is compelled to investigate by treating as images the things imitated in the former division, and by means of assumptions from which it proceeds not up to a first principle but down to a conclusion, while there is another section in which it advances from its assumption to a beginning or principle that transcends assumption, and in which it makes no use of the images employed by the other section, relying on ideas only and progressing systematically through ideas.

I don't fully understand what you mean by this, he said.

Well, I will try again, said I, for you will better understand after c
this preamble. For I think you are aware that students of geometry and reckoning and such subjects first postulate the odd and the even and the various figures and three kinds of angles and other things akin to these in each branch of science, regard them as known, and, treating them as absolute assumptions, do not deign to render any further account of them to themselves or others, taking it for granted that

they are obvious to everybody. They take their start from these, and
d pursuing the inquiry from this point on consistently, conclude with that for the investigation of which they set out.

Certainly, he said, I know that.

And do you not also know that they further make use of the visible forms and talk about them, though they are not thinking of them but of those things of which they are a likeness, pursuing their inquiry for the sake of the square as such and the diagonal as such, and not for the sake of the image of it which they draw? And so in all cases. The very things which they mold and draw, which have shad-
e ows and images of themselves in water, these things they treat in their turn as only images, but what they really seek is to get sight of those realities which can be seen only by the mind.

511 True, he said.

This then is the class that I described as intelligible, it is true, but with the reservation first that the soul is compelled to employ assumptions in the investigation of it, not proceeding to a first principle because of its inability to extricate itself from and rise above its assumptions, and second, that it uses as images or likenesses the very objects that are themselves copied and adumbrated by the class below them, and that in comparison with these latter are esteemed as clear and held in honor.

b I understand, said he, that you are speaking of what falls under geometry and the kindred arts.

Understand then, said I, that by the other section of the intelligible I mean that which the reason itself lays hold of by the power of dialectic, treating its assumptions not as absolute beginnings but literally as hypotheses, underpinnings, footings, and springboards so to speak, to enable it to rise to that which requires no assumption and is the starting point of all, and after attaining to that again taking hold of the first dependencies from it, so to proceed downward to the
c conclusion, making no use whatever of any object of sense but only of pure ideas moving on through ideas to ideas and ending with ideas.

I understand, he said, not fully, for it is no slight task that you appear to have in mind, but I do understand that you mean to distinguish the aspect of reality and the intelligible, which is contemplated by the power of dialectic, as something truer and more exact than the object of the so-called arts and sciences whose assumptions are arbitrary starting points. And though it is true that those who contemplate
d them are compelled to use their understanding and not their senses, yet because they do not go back to the beginning in the study of them but start from assumptions you do not think they possess true intelligence about them although the things themselves are intelligibles when apprehended in conjunction with a first principle. And I think you call the mental habit of geometers and their like mind or understanding and not reason because you regard understanding as something intermediate between opinion and reason.

Your interpretation is quite sufficient, I said. And now, answering to these four sections, assume these four affections occurring in the soul—intellection or reason for the highest, understanding for the second, belief for the third, and for the last, picture thinking or e
conjecture—and arrange them in a proportion, considering that they participate in clearness and precision in the same degree as their objects partake of truth and reality.

I understand, he said. I concur and arrange them as you bid.

## BOOK VII

Next, said I, compare our nature in respect of education and its lack 514
to such an experience as this. Picture men dwelling in a sort of subterranean cavern with a long entrance open to the light on its entire width. Conceive them as having their legs and necks fettered from childhood, so that they remain in the same spot, able to look forward only, and prevented by the fetters from turning their heads. Picture b
further the light from a fire burning higher up and at a distance behind them, and between the fire and the prisoners and above them a road along which a low wall has been built, as the exhibitors of puppet shows have partitions before the men themselves, above which they show the puppets.

All that I see, he said.

See also, then, men carrying past the wall implements of all kinds that rise above the wall, and human images and shapes of ani- c
mals as well, wrought in stone and wood and every material, some of 515
these bearers presumably speaking and others silent.

A strange image you speak of, he said, and strange prisoners.

Like to us, I said. For, to begin with, tell me do you think that these men would have seen anything of themselves or of one another except the shadows cast from the fire on the wall of the cave that fronted them?

How could they, he said, if they were compelled to hold their b
heads unmoved through life?

And again, would not the same be true of the objects carried past them?

Surely.

If then they were able to talk to one another, do you not think that they would suppose that in naming the things that they saw they were naming the passing objects?

Necessarily.

And if their prison had an echo from the wall opposite them, when one of the passers-by uttered a sound, do you think that they

would suppose anything else than the passing shadow to be the speaker?

By Zeus, I do not, said he.

Then in every way such prisoners would deem reality to be nothing else than the shadows of the artificial objects.

Quite inevitably, he said.

Consider, then, what would be the manner of the release and healing from these bonds and this folly if in the course of nature something of this sort should happen to them. When one was freed from his fetters and compelled to stand up suddenly and turn his head around and walk and to lift up his eyes to the light, and in doing all this felt pain and, because of the dazzle and glitter of the light, was unable to discern the objects whose shadows he formerly saw, what do you suppose would be his answer if someone told him that what he had seen before was all a cheat and an illusion, but that now, being nearer to reality and turned toward more real things, he saw more truly? And if also one should point out to him each of the passing objects and constrain him by questions to say what it is, do you not think that he would be at a loss and that he would regard what he formerly saw as more real than the things now pointed out to him?

Far more real, he said.

And if he were compelled to look at the light itself, would not that pain his eyes, and would he not turn away and flee to those things which he is able to discern and regard them as in very deed more clear and exact than the objects pointed out?

It is so, he said.

And if, said I, someone should drag him thence by force up the ascent which is rough and steep, and not let him go before he had drawn him out into the light of the sun, do you not think that he would find it painful to be so haled along, and would chafe at it, and when he came out into the light, that his eyes would be filled with its beams so that he would not be able to see even one of the things that we call real?

Why, no, not immediately, he said.

Then there would be need of habituation, I take it, to enable him to see the things higher up. And at first he would most easily discern the shadows and, after that, the likenesses or reflections in water of men and other things, and later, the things themselves, and from these he would go on to contemplate the appearances in the heavens and heaven itself, more easily by night, looking at the light of the stars and the moon, than by day the sun and the sun's light.

Of course.

And so, finally, I suppose, he would be able to look upon the sun itself and see its true nature, not by reflections in water or phantasms of it in an alien setting, but in and by itself in its own place.

Necessarily, he said.

And at this point he would infer and conclude that this it is that provides the seasons and the courses of the year and presides over all things in the visible region, and is in some sort the cause of all these c
things that they had seen.

Obviously, he said, that would be the next step.

Well then, if he recalled to mind his first habitation and what passed for wisdom there, and his fellow bondsmen, do you not think that he would count himself happy in the change and pity them?

He would indeed.

And if there had been honors and commendations among them which they bestowed on one another and prizes for the man who is quickest to make out the shadows as they pass and best able to remember their customary precedences, sequences, and coexistences, and so d
most successful in guessing at what was to come, do you think he would be very keen about such rewards, and that he would envy and emulate those who were honored by these prisoners and lorded it among them, or that he would feel with Homer and greatly prefer while living on earth to be serf of another, a landless man, and endure anything rather than opine with them and live that life?

Yes, he said, I think that he would choose to endure anything e
rather than such a life.

And consider this also, said I. If such a one should go down again and take his old place would he not get his eyes full of darkness, thus suddenly coming out of the sunlight?

He would indeed.

Now if he should be required to contend with these perpetual 517
prisoners in 'evaluating' these shadows while his vision was still dim and before his eyes were accustomed to the dark—and this time required for habituation would not be very short—would he not provoke laughter, and would it not be said of him that he had returned from his journey aloft with his eyes ruined and that it was not worth while even to attempt the ascent? And if it were possible to lay hands on and to kill the man who tried to release them and lead them up, would they not kill him?

They certainly would, he said.

This image then, dear Glaucon, we must apply as a whole to all that has been said, likening the region revealed through sight to the b
habitation of the prison, and the light of the fire in it to the power of the sun. And if you assume that the ascent and the contemplation of the things above is the soul's ascension to the intelligible region, you will not miss my surmise, since that is what you desire to hear. But Gods knows whether it is true. But, at any rate, my dream as it appears to me is that in the region of the known the last thing to be seen and hardly seen is the idea of good, and that when seen it must needs point us to the conclusion that this is indeed the cause for all things c
of all that is right and beautiful, giving birth in the visible world to light, and the author of light and itself in the intelligible world being the authentic source of truth and reason, and that anyone who is to act wisely in private or public must have caught sight of this.

I concur, he said, so far as I am able.

MORE from REPUBLIC, BOOK VII

But now, what about the bigness and the smallness of these objects? Is our vision's view of them adequate, and does it make no difference to it whether one of them is situated outside or in the middle, and similarly of the relation of touch, to thickness and thinness, softness and hardness? And are not the other senses also defective in
524 their reports of such things? Or is the operation of each of them as follows? In the first place, the sensation that is set over the hard is of necessity related also to the soft, and it reports to the soul that the same thing is both hard and soft to its perception.

It is so, he said.

Then, said I, is not this again a case where the soul must be at a loss as to what significance for it the sensation of hardness has, if the sense reports the same thing as also soft? And, similarly, as to what the sensation of light and heavy means by light and heavy, if it reports the heavy as light, and the light as heavy?

b Yes, indeed, he said, these communications to the soul are strange and invite reconsideration.

Naturally, then, said I, it is in such cases as these that the soul first summons to its aid the calculating reason and tries to consider whether each of the things reported to it is one or two.

Of course.

And if it appears to be two, each of the two is a distinct unit.

Yes.

If, then, each is one and both two, the very meaning of 'two' is that the soul will conceive them as distinct. For if they were not separable, it would not have been thinking of two, but of one.

Right.

Sight too saw the great and the small, we say, not separated but confounded. Is not that so?

Yes.

And for the clarification of this, the intelligence is compelled to contemplate the great and small, not thus confounded but as distinct entities, in the opposite way from sensation.

True.

And is it not in some such experience as this that the question first occurs to us, What in the world, then, is the great and the small?

By all means.

And this is the origin of the designation *intelligible* for the one, and *visible* for the other.

Just so, he said. d

This, then, is just what I was trying to explain a little while ago when I said that some things are provocative of thought and some are not, defining as provocative things that impinge upon the senses together with their opposites, while those that do not I said do not tend to awaken reflection.

Well, now I understand, he said, and agree.

To which class, then, do you think number and the one belong?

I cannot conceive, he said.

Well, reason it out from what has already been said. For, if unity is adequately seen by itself or apprehended by some other sensation, it would not tend to draw the mind to the apprehension of essence, as we were explaining in the case of the finger. But if some contra- e
diction is always seen coincidentally with it, so that it no more appears to be one than the opposite, there would forthwith be need of something to judge between them, and it would compel the soul to be at a loss and to inquire, by arousing thought in itself, and to ask, whatever then is the one as such, and thus the study of unity will be
525 one of the studies that guide and convert the soul to the contemplation of true being.

But surely, he said, the visual perception of it does especially involve this. For we see the same thing at once as one and as an indefinite plurality.

Then if this is true of the one, I said, the same holds of all number, does it not?

Of course.

But, further, reckoning and the science of arithmetic are wholly concerned with number.

They are, indeed.

And the qualities of number appear to lead to the apprehension b
of truth.

Beyond anything, he said.

Then, as it seems, these would be among the studies that we are seeking. For a soldier must learn them in order to marshal his troops, and a philosopher because he must rise out of the region of generation and lay hold on essence or he can never become a true reckoner.

It is so, he said.

And our guardian is soldier and philosopher in one.

Of course.

It is befitting, then, Glaucon, that this branch of learning should be prescribed by our law and that we should induce those who are to share the highest functions of state to enter upon that study of calcu- c
lation and take hold of it, not as amateurs, but to follow it up until they attain to the contemplation of the nature of number, by pure thought, not for the purpose of buying and selling, as if they were preparing to be merchants or hucksters, but for the uses of war and for

facilitating the conversion of the soul itself from the world of generation to essence and truth.

Excellently said, he replied.

And, further, I said, it occurs to me, now that the study of reckoning has been mentioned, that there is something fine in it, and that it is useful for our purpose in many ways, provided it is pursued for the sake of knowledge and not for huckstering.

In what respect? he said.

Why, in respect of the very point of which we were speaking, that it strongly directs the soul upward and compels it to discourse about pure numbers, never acquiescing if anyone proffers to it in the discussion numbers attached to visible and tangible bodies. For you are doubtless aware that experts in this study, if anyone attempts to cut up the 'one' in argument, laugh at him and refuse to allow it, but if *you* mince it up, *they* multiply, always on guard lest the one should appear to be not one but a multiplicity of parts.

Most true, he replied.

Suppose now, Glaucon, someone were to ask them, My good friends, what numbers are these you are talking about, in which the one is such as you postulate, each unity equal to every other without the slightest difference and admitting no division into parts? What do you think would be their answer?

This, I think—that they are speaking of units which can only be conceived by thought, and which it is not possible to deal with in any other way.

You see, then, my friend, said I, that this branch of study really seems to be indispensable for us, since it plainly compels the soul to employ pure thought with a view to truth itself.

It most emphatically does.

Again, have you ever noticed this, that natural reckoners are by nature quick in virtually all their studies? And the slow, if they are trained and drilled in this, even if no other benefit results, all improve and become quicker than they were?

It is so, he said.

And, further, as I believe, studies that demand more toil in the learning and practice than this we shall not discover easily nor find many of them.

You will not, in fact.

Then, for all these reasons, we must not neglect this study, but must use it in the education of the best-endowed natures.

I agree, he said.

Assuming this one point to be established, I said, let us in the second place consider whether the study that comes next is suited to our purpose.

What is that? Do you mean geometry? he said.

Precisely that, said I.

So much of it, he said, as applies to the conduct of war is ob- d
viously suitable. For in dealing with encampments and the occupation of strong places and the bringing of troops into column and line and all the other formations of an army in actual battle and on the march, an officer who had studied geometry would be a very different person from what he would be if he had not.

But still, I said, for such purposes a slight modicum of geometry and calculation would suffice. What we have to consider is whether the greater and more advanced part of it tends to facilitate the ap- e
prehension of the idea of good. That tendency, we affirm, is to be found in all studies that force the soul to turn its vision round to the region where dwells the most blessed part of reality, which it is imperative that it should behold.

You are right, he said.

Then if it compels the soul to contemplate essence, it is suitable; if genesis, it is not.

So we affirm. 527

This at least, said I, will not be disputed by those who have even a slight acquaintance with geometry, that this science is in direct contradiction with the language employed in it by its adepts.

How so? he said.

Their language is most ludicrous, though they cannot help it, for they speak as if they were doing something and as if all their words were directed toward action. For all their talk is of squaring and applying and adding and the like, whereas in fact the real object of the entire study is pure knowledge.

That is absolutely true, he said. b

And must we not agree on a further point?

What?

That it is the knowledge of that which always is, and not of a something which at some time comes into being and passes away.

That is readily admitted, he said, for geometry is the knowledge of the eternally existent.

Then, my good friend, it would tend to draw the soul to truth, and would be productive of a philosophical attitude of mind, directing upward the faculties that now wrongly are turned earthward.

Nothing is surer, he said.

Then nothing is surer, said I, than that we must require that the c
men of your fair city shall never neglect geometry, for even the by-products of such study are not slight.

What are they? said he.

What you mentioned, said I, its uses in war, and also we are aware that for the better reception of all studies there will be an immeasurable difference between the student who has been imbued with geometry and the one who has not.

Immense indeed, by Zeus, he said.

from MENO

SOCRATES: Those who tell it are priests and priestesses of the sort who make it their business to be able to account for the functions
91 b which they perform. Pindar speaks of it too, and many another of the poets who are divinely inspired. What they say is this—see whether you think they are speaking the truth. They say that the soul of man is immortal. At one time it comes to an end—that which is called death—and at another is born again, but is never finally exterminated. On these grounds a man must live all his days as righteously as possible. For those from whom

> Persephone receives requital for ancient doom,
> In the ninth year she restores again
> Their souls to the sun above.
> From whom rise noble kings
> c And the swift in strength and greatest in wisdom,
> And for the rest of time
> They are called heroes and sanctified by men.[2]

Thus the soul, since it is immortal and has been born many times, and has seen all things both here and in the other world, has learned everything that is. So we need not be surprised if it can recall the knowledge of virtue or anything else which, as we see, it once pos-
d sessed. All nature is akin, and the soul has learned everything, so that when a man has recalled a single piece of knowledge—*learned* it, in ordinary language—there is no reason why he should not find out all the rest, if he keeps a stout heart and does not grow weary of the search, for seeking and learning are in fact nothing but recollection.

We ought not then to be led astray by the contentious argument you quoted. It would make us lazy, and is music in the ears of
e weaklings. The other doctrine produces energetic seekers after knowledge, and being convinced of its truth, I am ready, with your help, to inquire into the nature of virtue.

MENO: I see, Socrates. But what do you mean when you say that we don't learn anything, but that what we call learning is recollection? Can you teach me that it is so?

SOCRATES: I have just said that you're a rascal, and now you
82 ask me if I can teach you, when I say there is no such thing as teaching, only recollection. Evidently you want to catch me contradicting myself straightaway.

MENO: No, honestly, Socrates, I wasn't thinking of that. It was just habit. If you can in any way make clear to me that what you say is true, please do.

SOCRATES: It isn't an easy thing, but still I should like to do

[2] Pindar, fr. 133.

what I can since you ask me. I see you have a large number of retainers b
here. Call one of them, anyone you like, and I will use him to demonstrate it to you.

MENO: Certainly. [*To a slave boy.*] Come here.

SOCRATES: He is a Greek and speaks our language?

MENO: Indeed yes—born and bred in the house.

SOCRATES: Listen carefully then, and see whether it seems to you that he is learning from me or simply being reminded.

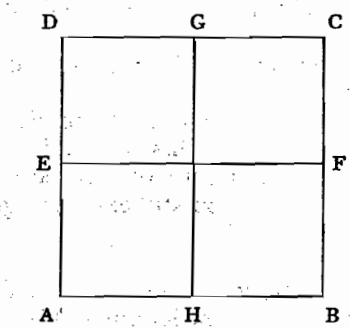
MENO: I will.

SOCRATES: Now boy, you know that a square is a figure like this?

(*Socrates begins to draw figures in the sand at his feet. He points to the square* ABCD.)

BOY: Yes.

SOCRATES: It has all these four sides equal? c




BOY: Yes.

SOCRATES: And these lines which go through the middle of it are also equal? [EF, GH.]

BOY: Yes.

SOCRATES: Such a figure could be either larger or smaller, could it not?

BOY: Yes.

SOCRATES: Now if this side is two feet long, and this side the same, how many feet will the whole be? Put it this way. If it were two feet in this direction and only one in that, must not the area be two feet taken once?

BOY: Yes.

SOCRATES: But since it is two feet this way also, does it not be- d
come twice two feet?

BOY: Yes.

SOCRATES: And how many feet is twice two? Work it out and tell me.

BOY: Four.

SELECTIONS from PLATO on MATHEMATICS p 12

SOCRATES: Now could one draw another figure double the size of this, but similar, that is, with all its sides equal like this one?

BOY: Yes.

SOCRATES: How many feet will its area be?

BOY: Eight.

SOCRATES: Now then, try to tell me how long each of its sides
e will be. The present figure has a side of two feet. What will be the side of the double-sized one?

BOY: It will be double, Socrates, obviously.

SOCRATES: You see, Meno, that I am not teaching him anything, only asking. Now he thinks he knows the length of the side of the eight-foot square.

MENO: Yes.

SOCRATES: But does he?

MENO: Certainly not.

SOCRATES: He thinks it is twice the length of the other.

MENO: Yes.

SOCRATES: Now watch how he recollects things in order—the proper way to recollect.

82 You say that the side of double length produces the double-sized figure? Like this I mean, not long this way and short that. It must be equal on all sides like the first figure, only twice its size, that is, eight feet. Think a moment whether you still expect to get it from doubling the side.

BOY: Yes, I do.

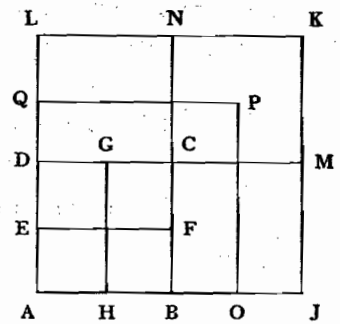
SOCRATES: Well now, shall we have a line double the length of this [AB] if we add another the same length at this end [BJ]?

BOY: Yes.

SOCRATES: It is on this line then, according to you, that we shall make the eight-foot square, by taking four of the same length?

b BOY: Yes.

SOCRATES: Let us draw in four equal lines [*i.e., counting* AJ *and adding* JK, KL, *and* LA *made complete by drawing in its second half* LD], using the first as a base. Does this not give us what you call the eight-foot figure?




BOY: Certainly.

SOCRATES: But does it contain these four squares, each equal to the original four-foot one?

(*Socrates has drawn in the lines* CM, CN *to complete the squares that he wishes to point out.*)

BOY: Yes.

SOCRATES: How big is it then? Won't it be four times as big?

BOY: Of course.

SOCRATES: And is four times the same as twice?

BOY: Of course not.

SOCRATES: So doubling the side has given us not a double but c
a fourfold figure?

BOY: True.

SOCRATES: And four times four are sixteen, are they not?

BOY: Yes.

SOCRATES: Then how big is the side of the eight-foot figure? This one has given us four times the original area, hasn't it?

BOY: Yes.

SOCRATES: And a side half the length gave us a square of four feet?

BOY: Yes.

SOCRATES: Good. And isn't a square of eight feet double this one and half that?

BOY: Yes.

SOCRATES: Will it not have a side greater than this one but less than that?

BOY: I think it will. d

SOCRATES: Right. Always answer what you think. Now tell me. Was not this side two feet long, and this one four?

BOY: Yes.

SOCRATES: Then the side of the eight-foot figure must be longer than two feet but shorter than four?

BOY: It must.

SOCRATES: Try to say how long you think it is. e

BOY: Three feet.

SOCRATES: If so, shall we add half of this bit [BO, *half of* BJ] and make it three feet? Here are two, and this is one, and on this side similarly we have two plus one, and here is the figure you want.

(*Socrates completes the square* AOPQ.)

BOY: Yes.

SOCRATES: If it is three feet this way and three that, will the whole area be three times three feet?

BOY: It looks like it.

SOCRATES: And that is how many?

BOY: Nine.

SOCRATES: Whereas the square double our first square had to be how many?

BOY: Eight.

SOCRATES: But we haven't yet got the square of eight feet even from a three-foot side?

BOY: No.

SOCRATES: Then what length will give it? Try to tell us exactly.
84 If you don't want to count it up, just show us on the diagram.

BOY: It's no use, Socrates, I just don't know.

SOCRATES: Observe, Meno, the stage he has reached on the path of recollection. At the beginning he did not know the side of the square of eight feet. Nor indeed does he know it now, but then he thought he knew it and answered boldly, as was appropriate—he felt no perplexity. Now however he does feel perplexed. Not only does he
b not know the answer; he doesn't even think he knows.

MENO: Quite true.

SOCRATES: Isn't he in a better position now in relation to what he didn't know?

MENO: I admit that too.

SOCRATES: So in perplexing him and numbing him like the sting ray, have we done him any harm?

MENO: I think not.

SOCRATES: In fact we have helped him to some extent toward finding out the right answer, for now not only is he ignorant of it but he will be quite glad to look for it. Up to now, he thought he could speak well and fluently, on many occasions and before large audi-
c ences, on the subject of a square double the size of a given square, maintaining that it must have a side of double the length.

MENO: No doubt.

SOCRATES: Do you suppose then that he would have attempted to look for, or learn, what he thought he knew, though he did not, before he was thrown into perplexity, became aware of his ignorance, and felt a desire to know?

MENO: No.

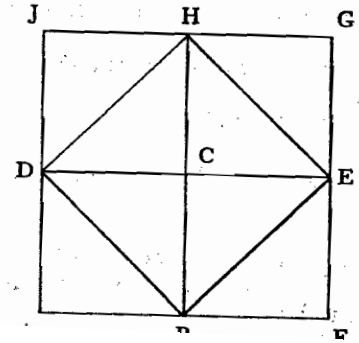
SOCRATES: Then the numbing process was good for him?

MENO: I agree.

SOCRATES: Now notice what, starting from this state of perplexity, he will discover by seeking the truth in company with me,
d though I simply ask him questions without teaching him. Be ready to catch me if I give him any instruction or explanation instead of simply interrogating him on his own opinions.

(*Socrates here rubs out the previous figures and starts again.*)

Tell me, boy, is not this our square of four feet? [ABCD.] You understand?




BOY: Yes.

SOCRATES: Now we can add another equal to it like this? [BCEF.]

BOY: Yes.

SOCRATES: And a third here, equal to each of the others? [CEGH.]

BOY: Yes.

SOCRATES: And then we can fill in this one in the corner? [DCHJ.]

BOY: Yes.

SOCRATES: Then here we have four equal squares?

BOY: Yes. e

SOCRATES: And how many times the size of the first square is the whole?

BOY: Four times.

SOCRATES: And we want one double the size. You remember?

BOY: Yes.

SOCRATES: Now does this line going from corner to corner cut each of these squares in half? 85

BOY: Yes.

SOCRATES: And these are four equal lines enclosing this area? [BEHD.]

BOY: They are.

SOCRATES: Now think. How big is this area?

BOY: I don't understand.

SOCRATES: Here are four squares. Has not each line cut off the inner half of each of them?

BOY: Yes.

SOCRATES: And how many such halves are there in this figure? [BEHD.]

BOY: Four.

SOCRATES: And how many in this one? [ABCD.]

BOY: Two.

SOCRATES: And what is the relation of four to two?

BOY: Double.

SOCRATES: How big is this figure then?

b BOY: Eight feet.

SOCRATES: On what base?

BOY: This one.

SOCRATES: The line which goes from corner to corner of the square of four feet?

BOY: Yes.

SOCRATES: The technical name for it is 'diagonal'; so if we use that name, it is your personal opinion that the square on the diagonal of the original square is double its area.

BOY: That is so, Socrates.

SOCRATES: What do you think, Meno? Has he answered with any opinions that were not his own?

c MENO: No, they were all his.

SOCRATES: Yet he did not know, as we agreed a few minutes ago.

MENO: True.

SOCRATES: But these opinions were somewhere in him, were they not?

MENO: Yes.

SOCRATES: So a man who does not know has in himself true opinions on a subject without having knowledge.