POSTERIOR ANALYTICS

Jonathan Barnes

BOOK I

71ª1 1 · All teaching and all intellectual learning come about from already existing knowledge. This is evident if we consider it in every case; for the mathematical sciences are acquired in this fashion, and so is each of the other arts. And similarly too with arguments—both deductive and inductive arguments proceed in this way; for both produce their teaching through what we are already aware of, the former getting their premisses as from men who grasp them, the latter proving the universal through the particular's being clear. (And rhetorical arguments too persuade in the same way; for they do so either through examples, which is induction, or through enthymemes, which is deduction.)

It is necessary to be already aware of things in two ways: of some things it is necessary to believe already that they are, of some one must grasp what the thing said is, and of others both—e.g. of the fact that everything is either affirmed or denied truly, one must believe that it is; of the triangle, that it signifies *this*; and of the unit both (both what it signifies and that it is). For each of these is not equally clear to us.

But you can become familiar by being familiar earlier with some things but getting knowledge of the others at the very same time—i.e. of whatever happens to be under the universal of which you have knowledge. For that every triangle has angles equal to two right angles was already known; but that there is a triangle in the semicircle here became familiar at the same time as the induction. (For in some cases learning occurs in this way, and the last term does not become familiar through the middle—in cases dealing with what are in fact particulars and not said of any underlying subject.)

Before the induction, or before getting a deduction, you should perhaps be said to understand in a way—but in another way not. For if you did not know if it is *simpliciter*, how did you know that it has two right angles *simpliciter*? But it is clear that you understand it in *this* sense—that you understand it universally—but you do not understand it *simpliciter*. (Otherwise the puzzle in the *Meno*[1] will result; for you will learn either nothing or what you know.)

TEXT: W. D. Ross, OCT, Oxford, 1964
[1]See Plato, *Meno* 80D.

For one should not argue in the way in which some people attempt to solve it: Do you or don't you know of every pair that it is even? And when you said Yes, they brought forward some pair of which you did not think that it was, nor therefore that it was even. For they solve it by denying that people know of every pair that it is even, but only of anything of which they know that it is a pair.—Yet they know it of 70ᵇ1 that which they have the demonstration about and which they got their premisses about; and they got them not about everything of which they know that it is a triangle or that it is a number, but of every number and triangle *simpliciter*. For no proposition of such a type is assumed (that *what you know to be a number* . . . or *what you know to be rectilineal* . . .), but they are assumed as holding of every 5 case.

But nothing, I think, prevents one from in a sense understanding and in a sense being ignorant of what one is learning; for what is absurd is not that you should know in some sense what you are learning, but that you should know it in *this* sense, i.e. in the way and sense in which you are learning it.

2 · We think we understand a thing *simpliciter* (and not in the sophistic fashion accidentally) whenever we think we are aware both that the explanation 10 because of which the object is is its explanation, and that it is not possible for this to be otherwise. It is clear, then, that to understand is something of this sort; for both those who do not understand and those who do understand—the former think they are themselves in such a state, and those who do understand actually are. Hence 15 that of which there is understanding *simpliciter* cannot be otherwise.

Now whether there is also another type of understanding we shall say later; but we say now that we do know through demonstration. By demonstration I mean a scientific deduction; and by scientific I mean one in virtue of which, by having it, we understand something.

If, then, understanding is as we posited, it is necessary for demonstrative 20 understanding in particular to depend on things which are true and primitive and immediate and more familiar than and prior to and explanatory of the conclusion (for in this way the principles will also be appropriate to what is being proved). For there will be deduction even without these conditions, but there will not be demonstration; for it will not produce understanding.

Now they must be true because one cannot understand what is not the 25 case—e.g. that the diagonal is commensurate. And they must depend on what is primitive and non-demonstrable because otherwise you will not understand if you do not have a demonstration of them; for to understand that of which there is a demonstration non-accidentally is to have a demonstration. They must be both explanatory and more familiar and prior—explanatory because we only understand 30 when we know the explanation; and prior, if they are explanatory, and we are already aware of them not only in the sense of grasping them but also of knowing that they are.

Things are prior and more familiar in two ways; for it is not the same to be prior by nature and prior in relation to us, nor to be more familiar and more familiar 72ª1

17 · Is it possible for there not to be the same explanation of the same thing for every case, but a different one? or not? Perhaps if it has been demonstrated in itself and not in virtue of a sign or accidentally it is not possible (for the middle term is the account of the extreme), but if it has not been demonstrated in this way, it is possible? One can inquire accidentally both about what it is explanatory of and about what it is explanatory for—but these do not seem to be problems. Otherwise, the middle term will have a similar character—if they are homonymous, the middle will be homonymous; if they are in a genus, it will have a similar character.

E.g. why do proportionals alternate? For the explanation in the cases of lines and of numbers is different—*and* the same: as lines it is different, as having such and such an increase it is the same. And so in all cases.

The explanation of a colour's being similar to a colour and a figure to a figure is different in the different cases. For what is similar is homonymous in these cases; for here it is presumably having proportionate sides and equal angles, but in the case of colours it is that perception of them is single, or something else of that sort.

And things which are the same by analogy will have their middle term the same by analogy too.

The explanation and what it is explanatory of and what it is explanatory for are interrelated like this: taking them severally, what it is explanatory of extends further (e.g. having external angles equal to four right angles extends further than either triangle or quadrangle), but for all of them together it extends equally (for they comprise everything that has external angles equal to four right angles); and similarly for the middle term. (But the middle term is an account of the first extreme: that is why all the sciences come about through definition.)

E.g. shedding leaves follows together with the vine and exceeds it; and with the fig, and exceeds it—but not all of them, but it is equal.

Thus if you were to take the primitive middle term, it is an account of shedding leaves. For there will be a middle term in the other direction (that all are *such and such*); and then a middle for this (that the sap solidifies or something else of that sort). What is shedding leaves? The solidifying of the sap at the connection of the seed.

Schematically it will come out as follows for anyone seeking the interrelation between the explanation and what it is explanatory of: Let A belong to every B, and B to each of the D's, and further. Thus B will hold universally of the D's (for I call universal that with which they do not convert, and primitive universal that with which severally they do not convert but taken all together they do convert and extend alongside). Thus B is explanatory of A for the D's. Therefore A must extend alongside further than B; for if it does not, why will this be explanatory rather than that?

Well, if A belongs to all the E's, all of them together will be some one thing different from B. For if not, how will one be able to say that A belongs to everything to which E belongs but E does not belong to everything to which A belongs? For why will there not be some explanation, as of its belonging to all the D's? (But *will* the DE's be some one thing? We must inquire into this; let it be C.)

Thus it is possible for there to be several explanations of the same thing, but not for things of the same species—e.g. the explanation of longevity for quadrupeds is their not having bile, but for birds their being dry or something else.

18 · If they do not come at once to what is atomic and there is not only one middle term but several, the explanations too are several. But which of the middle terms is explanatory for the particulars—that which is primitive in the direction of the universal or that which is primitive in the direction of the particular? Well, it is clear that it is the one nearest to what it is explanatory for. For this explains why the primitive term belongs under the universal—i.e. C is explanatory for D of B's belonging to it. So for D C is explanatory of A, and for C B, and for this itself.

19 · Now as for deduction and demonstration, it is evident both what each is and how it comes about—and at the same time this goes for demonstrative understanding too (for that is the same thing). But as for the principles—how they become familiar and what is the state that becomes familiar with them—that will be clear from what follows, when we have first set down the puzzles.

Now, we have said earlier that it is not possible to understand through demonstration if we are not aware of the primitive, immediate, principles. But as to knowledge of the immediates, one might puzzle both whether it is the same or not the same—whether there is understanding of each, or rather understanding of the one and some other kind of thing of the other—and also whether the states are not present in us but come about in us, or whether they are present in us but escape notice.

Well, if we have them, it is absurd; for it results that we have pieces of knowledge more precise than demonstration and yet this escapes notice. But if we get them without having them earlier, how might we become familiar with them and learn them from no pre-existing knowledge? For that is impossible, as we said in the case of demonstration too. It is evidently impossible, then, both for us to have them and for them to come about in us when we are ignorant and have no such state at all. Necessarily, therefore, we have some capacity, but do not have one of a type which will be more valuable than these in respect of precision.

And *this* evidently belongs to all animals; for they have a connate discriminatory capacity, which is called perception. And if perception is present in them, in some animals retention of the percept comes about, but in others it does not comes about. Now for those in which it does not come about, there is no knowledge outside perceiving (either none at all, or none with regard to that of which there is no retention); but for some[52] perceivers, it is possible to grasp it in their minds. And when many such things come about, then a difference comes about, so that some come to have an account from the retention of such things, and others do not.

So from perception there comes memory, as we call it, and from memory (when it occurs often in connection with the same thing), experience; for memories

[52]Reading ἐνιοῖς δ' ἐστιν αἰσθανομένοις for ἐν οἷς δ' ἔνεστιν αἰσθομένοις.

that are many in number from a single experience. And from experience, or from the whole universal that has come to rest in the soul (the one apart from the many, whatever is one and the same in all those things), there comes a principle of skill and of understanding—of skill if it deals with how things come about, of understanding if it deals with what is the case.

Thus the states neither belong in us in a determinate form, nor come about from other states that are more cognitive; but they come about from perception—as in a battle when a rout occurs, if one man makes a stand another does and then another, until a position of strength[53] is reached. And the soul is such as to be capable of undergoing this.

What we have just said but not said clearly, let us say again: when one of the undifferentiated things makes a stand, there is a primitive universal in the mind (for though one perceives the particular, perception is of the universal—e.g. of man but not of Callias the man); again a stand is made in these, until what has no parts and is universal stands—e.g. *such and such* an animal stands, until animal does, and in this a stand is made in the same way. Thus it is clear that it is necessary for us to become familiar with the primitives by induction; for perception too[54] instils the universal in this way.

Since of the intellectual states by which we grasp truth some are always true and some admit falsehood (e.g. opinion and reasoning—whereas understanding and comprehension are always true), and no kind other than comprehension is more precise than understanding, and the principles of demonstrations are more familiar, and all understanding involves an account—there will not be understanding of the principles; and since it is not possible for anything to be truer than understanding, except comprehension, there will be comprehension of the principles—both if we inquire from these facts and because demonstration is not a principle of demonstration so that understanding is not a principle of understanding either—so if we have no other true kind apart from understanding, comprehension will be the principle of understanding. And the principle will be of the principle, and understanding as a whole will be similarly related to the whole object.

[53]Reading ἀλκήν for ἀρχήν.
[54]Reading καί for ἤ.

TOPICS

W. A. Pickard-Cambridge

BOOK I

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1 . Our treatise proposes to find a line of inquiry whereby we shall be able to reason from reputable opinions about any subject presented to us, and also shall ourselves, when putting forward an argument, avoid saying anything contrary to it. First, then, we must say what deduction is, and what its varieties are, in order to grasp dialectical deduction; for this is the object of our search in the treatise before us.

Now a deduction is an argument in which, certain things being laid down, something other than these necessarily comes about through them. It is a demonstration, when the premisses from which the deduction starts are true and primitive, or are such that our knowledge of them has originally come through premisses which are primitive and true; and it is a dialectical deduction, if it reasons from reputable opinions. Things are true and primitive which are convincing on the strength not of anything else but of themselves; for in regard to the first principles of science it is improper to ask any further for the why and wherefore of them; each of the first principles should command belief in and by itself. On the other hand, those opinions are reputable which are accepted by everyone or by the majority or by the wise—i.e. by all, or by the majority, or by the most notable and reputable of them. Again, a deduction is contentious if it starts from opinions that seem to be reputable, but are not really such, or again if it merely seems to reason from opinions that are or seem to be reputable. For not every opinion that seems to be reputable actually is reputable. For none of the opinions which we call reputable show their character entirely on the surface, as happens in the case of the principles of contentious arguments; for the nature of the falsity in these is obvious immediately, and for the most part even to persons with little power of comprehension. So then, of the contentious deductions mentioned, the former really deserves to be called deduction, but the other should be called contentious deduction, but not deduction, since it appears to deduce, but does not really do so.

Further, besides all the deductions we have mentioned there are the fallacies that start from the premisses peculiar to the special sciences, as happens (for

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TEXT: J. Brunschwig, Budé Paris, 1967 (Books I–IV)
W. D. Ross, OCT, Oxford, 1958 (Books V–VIII)