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LOGICAL TRUTH IN PLATO

By Robin Smith

In his works on the history of logic, I.M. Bochenski passes rather harsh judgment on Plato's practical competence in logic. His earlier *Ancient Formal Logic* claims that the dialogues are so full of "elementary blunders" that "the reading of them is almost intolerable to a logician".[1] Some of the harshest censure has been removed from the later *History of Formal Logic,* but Bochenski still regards Plato as struggling inordinately hard to "solve logical problems which we find quite elementary".[2] Despite this, he regards Plato as having been the first thinker in history to formulate a clear *idea* of logic. Now, I think Bochenski is wrong on both counts. More precisely, I think his diagnoses of "logical blunders" in Plato will not stand up to close analysis: not because Plato is a better "logician" than Bochenski thinks — although a little can be said for that — but because the whole notion of a peculiarly "logical" blunder is simply not usable to any great extent in criticizing an author who lacked a clear-cut notion of logical truth. This, of course, suggests my second point: I do not think that Plato actually formulated a clear conception of logic, at least in any terms recognizable by Bochenski himself or most any other contemporary logician. Thus, I do not believe that Plato had the conceptual means available to distinguish logical truths from physical or (if the expression is not too troublesome) metaphysical truths of great generality. In defending my second claim, I shall appeal to a particular interpretation of Aristotle's doctrine concerning the "peculiarity" (*oikeiotēs*) of scientific principles. If, as is plausible, we suppose that one of Aristotle's purposes in presenting this doctrine is to combat a certain Platonic picture of science or philosophy, we may gain some insight into the views of both men.

Let me begin with the notion of a logical blunder. It will help to discuss this in terms of an example. Bochenski finds the following particularly apt:

> ...Then I shall proceed to add, that if the temperate soul is the good soul, the soul which is in the opposite condition, that is, the foolish and intemperate soul, is the bad soul. (*Gorgias* 507a).

Bochenski comments: "In [this] text is involved the (false) thesis: Suppose, if *A* belongs to *x*, *B* also belongs to *x*, then: if *A* does not belong to *x*, then *B* does not belong to *x*" (*History of Formal Logic,* p. 35). Before we proceed to criticize this, let us take note of exactly what is being said. First, Bochenski refers to a "false thesis". The meaning of this expression is clear from his initial characterization of the subject matter of logic as what he calls "logical sentences". His characterization of these in turn is brief (pp. 2-3), but he clearly has in mind what a more familiar terminology would call logical forms or statement forms: expressions containing variable symbols which become statements when appropriate terms are substituted for these (syntactic) variable symbols. He also suggests that what logic actually studies is just those logical sentences all the substitution instances of which are true statements. We may without significant distortion equate

this view with Quine's definition of logic as "the systematic study of the logical truths"[3], given Quine's view that a statement is logically true if and only if every statement which shares its grammatical structure is true. In such a picture, the only meaningful way in which a logical sentence or statement form can be said to be "true" is if it is the form of a logical truth. Now, what would a false thesis be? The most obvious candidate would be: a statement form some of whose substitution instances are false. We usually determine that a form is not "true" in this sense by producing a counterinterpretation or counterinstance: a substitution instance which is obviously false. (Of course, everything that I have said here could be recast, *mutatis mutandis*, with "valid" in place of "true" and "argument" in place of "statement". I do not think anything important for what I have to say hinges on this.)

Superficially, then, Bochenski's criticism amounts to this: Plato's argument in the *Gorgias* instantiates an invalid form, i.e. one not logically true. That alone, however, is no reason to call it a "logical blunder". While every instance of a logically true form must be true, nothing at all prevents instances of forms not themselves logically true from being true. In fact, every statement is an instance of many such forms (the most obvious example, within the propositional calculus, being that of a variable standing alone, of which every statement is a substitution instance[4]). What further mistake has Plato committed besides giving us an argument that happens to include an instance of a "false thesis"? Presumably, what Bochenski has in mind is that Plato believed this false thesis to be a true thesis. Now, there are two sorts of evidence that we might look for that would indicate that Plato did in some sense believe this thesis. First, we might find that he accepted instances of it as true on many occasions. This is not, however, anything like unequivocal evidence that he accepted the thesis: it is instead a generalization about what he *would* have accepted, inductively based on a survey of cases he did apparently accept. Thus, we might reason: on many occasions, Plato takes as true various instances of Bochenski's false thesis from *Gorgias* 507a; therefore, he would have accepted as true *any* instance of this thesis. Now, aside from any difficulties about inductive uncertainty, there is a fundamental difficulty about what sort of acceptance is supposed to be involved here. Suppose, for instance, that it never came to Plato's attention that all the putative instances of the false thesis had some common structure. Do we then wish to say that he accepted the thesis unconsciously, or implicitly in some fashion? (Obviously, we can never know whether such a supposition is true, but the difficulty remains the same.) Furthermore, if Plato failed to give any conscious recognition to these instances as instances of a common principle, can we reasonably hold that he *made use* of the thesis in *Gorgias* 507a? There is an obvious difference between frequently producing statements which instantiate a certain form and (coincidentally) regarding them all as true, on the one hand, and producing these statements *because* one regards them as instances of a single logically true form. The evidence of argumentative practice alone simply cannot differentiate these possibilities.

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This may not seem to be a serious problem, but a genuinely intractable one follows closely behind it. The second sort of evidence we might hope for is an explicit assertion on Plato's part of the thesis in question. Now, we can hardly expect Plato to make use of variables in the way Bochenski does: no one before Aristotle used anything which could even be considered a syntactic variable. However, we may take advantage of the similarity of function between artificial formal devices like literal variables and many elements of natural languages such as pronouns. It is usually possible to substitute a word of an appropriate category for a pronoun in a sentence, for instance, and get a sentence as a result (with adjustments, if necessary, to cover niceties like gender, and with some clauses to deal with internal antecedents). Thus, we might hope to find some Platonic locutions which, while being ordinary Greek, or close to it, nevertheless functioned for Plato like variables. There are, in fact, sentences in Plato which contain rather large numbers of pronouns and other indefinite words, and it is tempting to see these as indicators of possible places for substitution. For example, consider this passage from the *Euthyphro:*

> I mean this: if something comes to be (*gignetai*), or if something undergoes (*paschei*), it is not because it is a thing coming to be that it comes to be, but rather because it comes to be that it is a thing coming to be; nor does it undergo because it is a thing that undergoes, but rather because it undergoes, it is a thing that undergoes. (10c1-4).

Translation of this passage, which has been the subject of a good deal of recent discussion[5], is impossible if one expects both idiomatic English and accuracy, but one thing is fairly clear: Plato is using *gignomenon* and *gignetai* very much like verb-variables ("pro-verbs", one might infelicitously say), and similarly using *paschon* and *paschei* as passive-verb-variables. He has previously had Socrates win Euthyphro's assent to a variety of substitution instances of the formula quoted, and he concludes by asserting the form itself; thus, he clearly means us to understand every instance of this form, with verbs substituted appropriately for *gignesthai* and *paschein,* to be true. Will passages like this be sufficient to show that Plato had the capacity for expressing logical sentences in Bochenski's sense?

I do not think so. *Any* variable-like word can be understood as a place-holder for substitution, as is illustrated by the development of truth-value semantics. A collection of substitutable terms by itself cannot be regarded as evidence for an awareness of logical form unless we wish to say that every one of Plato's contemporaries had a similar awareness. Of course, the *Euthyphro* passage has a lot of such terms in its brief compass, and it may even employ its expressions in a novel and inventive way. However, we could perfectly well regard Plato as asserting simply a generalization about a large class of things — the class of comings-to-be and being-done-tos, if you will — rather than presenting us with a statement scheme of some sort. What makes a statement a logical truth is not simply that every statement which can be derived from it by *appropriate* substitution for its variable-like expressions should come out true; otherwise, by a perfectly plausible notion of what counts as "appropriate" substitution, every

true universal quantification will come out as a logical truth. We must be more precise about what sorts of substitutions are appropriate in the case of a logical truth.

According to most usual understandings of the subject, a logical theory must make some distinction between logical constants and content words, or lexical items. One way to describe this distinction is in terms of the corresponding categories in artificial formal languages. Typically, logical constants have meanings or functions which can be reproduced within a formal language: thus, a word like "not" can actually be translated by an appropriate formal symbol in an artificial language (in this case a negation sign). Content words, on the other hand, have meanings which cannot be captured in artificial languages: typically their formal counterparts are variables, which in a formal system have meaning only in the Pickwickian sense of having some sort of allowable class of interpretations. Of course, what constitutes a logical constant and what a lexical item depends very much on one's standards of logical analysis. However, the principle of separating linguistic items into these two classes is closely linked to the separation of logical truths from other truths: a logical truth, in fact, is a statement the truth of which does not depend on its content words. Thus, a logical truth is a statement such that any other statement derived from it by substitution only for lexical items is true. Now, obviously, given the dependence of this characterization of logical truths on a prior distinction between logical and non-logical vocabulary, what counts as a logical truth on one analysis may not do so on another. I do not think this is a trivial concern for Platonic exegesis. Indeed, the issue appears with respect to the passage in *Gorgias* 507a.

Bochenski sees a rule being used which involves the concept of negation: concisely stated, that if whatever is *A* is *B*, then whatever is not *A* is not *B*. Plato's text does not contain an idiom we should usually translate with English expressions for negation, however; we find instead the locution "which is in the contrary condition" (*hē tounantion ... peponthuia*), and instead of two predicates to correspond to "*A*" and "*B*" we have four ("temperate", "good", "intemperate", "bad"). We must suppose Bochenski to be equating "intemperate" with "not temperate", "bad" with "not good", and "in the contrary condition to" with "not". At a superficial level, these are implausible: all terms involved are, in traditional terminology, contraries (*enantia*), not contradictories. However, Bochenski might have in mind the view that the only logically interesting property of contraries is that they are inconsistent. Thus, he may be dismissing any further significance of "contrary" as extralogical content. This will *almost* allow us to see his "false thesis" in Plato's argument by some such reasoning as this: if whatever is temperate is good, then (since whatever is intemperate is not temperate) whatever is intemperate is not good (by the "false thesis"). To get from here to the further conclusion that whatever is intemperate is bad, however, we must suppose that whatever is not good is bad. We can derive this result by using the false thesis again, if we allow ourselves also to eliminate a double negation: if whatever is good is not bad, then whatever is not good is not (not bad), thus bad. However, this process of derivation has become far more com-

plex than anything we can find in Plato's text. The fact is that it is just not very clear *how* Bochenski supposes his "false thesis" to be involved in Plato's argument. Let us, then, replace it with another, not at least so obviously false: suppose that A belongs to whatever B belongs to; then, if A and B both have contraries, the contrary of A belongs to whatever the contrary of B belongs to. This not only fits the text better, it has the advantage of being explicitly asserted by a near contemporary of Plato's: Aristotle cites very nearly this same rule several times in the *Topics* (e.g. B 8, 113b27-34; $\triangle$ 3, 123b4-7; E 6, 13.5b12-14; Z 9, 147a 31-33). Indeed, this sort of paired entailment relation between pairs of contrary terms seems to have played an important role in much ancient Greek speculation, both before and after Plato.[6] Does this new analysis permit us to form a more defensible view about the correctness of Plato's argument?

The answer is that everything depends on what we take "contrary" to mean — or, what comes to the same thing, on what we suppose the reason might have been for Plato, or Aristotle, or any other ancient Greek, to believe my revised thesis above. If we suppose contraries to be "the things most different of those in a single genus", to use a traditional definition,[7] we might suppose that there is no obvious logical reason for saying that "The contrary of B belongs to whatever the contrary of A belongs to" follows from "B belongs to whatever A belongs to." However, neither does this seem to be a logical falsehood, and so perhaps Plato believed that it is true in fact, though not logically true. On the other hand, perhaps the very meaning of the term "contrary" for Plato was so closely associated with this paired entailment relation that he would have considered any terms which failed to satisfy it not to be contraries for that very reason: if we think A and A', and similarly B and B', are contrary pairs, and if having A entails having B, but if having A' does not entail having B', then either A and A' are not contraries or B and B' are not. On such an interpretation, the revised thesis would be a logical truth, and Plato's inference would not be a logical error (except to the extent that he may have mistakenly thought that certain terms were contraries); on the first analysis, supposing Plato to have believed the thesis without taking it to be a logical truth, he has again committed no logical error but at most a factual one. We could only convict him of a peculiarly logical mistake if we could show three things simultaneously:

(1) Plato believed that if having some property entails having another property, then, if the properties in question have contraries,[8] having the contrary of the first entails having the contrary of the second.

(2) Given the meaning which "contrary" had in Plato's language, statement (1) is not a logical truth.

(3) Plato believed that statement (1) is a logical truth.

We cannot even begin to make a plausible case for anything like (3) unless we can find evidence that Plato could distinguish logical truths from other kinds of truth. Is there such evidence?

On the contrary, I think there is considerable evidence that Plato made no such distinction. One class of evidence is negative: Plato simply never elaborates any grammatical categories that allow him to describe the logical forms of

statements. An apparent exception here supports my claim: the discussion of the structure of sentences in *Sophist* 261d-264b, which introduces the categories "noun" and "verb" and the notions of affirmation and denial, deals only with the conditions of truth and falsehood for isolated simple predications. Nothing is said about elements of structure that could lead to inferential relations; and even this brief theory occurs in a late work. We do, to be sure, find him diagnosing erroneous patterns of argument in a number of places, for instance: the passage on composition and division in the *Hippias Major* (300b-302b); Diotima's correction of Socrates' belief that "neither beautiful nor good" entails "ugly and bad" (*Symposium* 201a-202b); or roughly every other page of the *Euthydemus*. However, the closest Plato comes to a notion of logical form in these cases is to argue that an argument is *invalid* by presenting another argument with a similar form which is obviously invalid, and even in these cases (as Bochenski observes), his concern for the practical details of each case suggests that, at the very least, he does not separate logical mistakes sharply from other sorts of false beliefs.

There is a third sort of evidence, which, although somewhat speculative, is more intriguing: Aristotle appears to have criticized Plato just exactly for having failed to distinguish logical truths from the truths of the special sciences.[9] A cardinal point of Aristotle's theory of science is that each science must proceed from its "peculiar principles" (*oikeiai archai*), that is, those basic propositions which characterize the genus which is the subject of that science. Usually coupled with this doctrine is Aristotle's denial of the possibility of a single science of all that there is: "all things are not in a single genus", he tells us "and even if they were, it would not be possible for the things that exist to be under the same principles" (*Soph. El.* 11, 172a 13-15). At the same time, we find in the *Rhetoric* (A 2) and the *Sophistical Refutations* (9-11) a concept of "dialectic" — the term seems to mean something very much like "logic" — which possesses, in a way, the very universality that proper sciences cannot have. Aristotle is rather concerned to explain how this is possible. The difficulty, in brief, is this: following a line first advanced by Plato, Aristotle is suspicious of the fact that the skilled debater, the "eristic" man or sophist, and the rhetorician can produce effective arguments without knowledge. These arts thus seem to be only counterfeits of wisdom, and indeed their very universality is evidence of this for both Aristotle and Plato. Nevertheless, Aristotle believes that he can distinguish, both in rhetoric and in "dialectic", a genuinely valuable skill which, despite its proximity to sophistic, is not inherently deceptive. He argues that there are certain terms — he calls them "the common things", *ta koina* — which in a way have application to all genera. As an instance of such a term, he occasionally notes "contrary". These terms figure in certain very general statements (he calls these "places", *topoi*, at *Rhet.* A 2, 1358a 10ff.) such as "there is a single faculty with respect to contraries" or "when equals are subtracted from equals, the results are equal." The study of these "common things" is of value for science because it is through them that the principles of sciences are themselves tested. However, from the *koina* themselves nothing "scientific" can actually be derived. Thus, the study of the *koina* is in a certain sense without content: Aristotle not infrequently criticizes arguments as "dialectical and empty" or

"verbal (*logikos*) and empty" (a particularly striking passage occurs in *De Gen. An.* B 8, 748a7-14, in which Aristotle says that such "verbal" arguments appear to be about the subject matter without actually being so). There is a similarity between this criticism and the modern view of logical truths as without factual content. I think there is also a further significance to these criticisms. Plato did, of course, conceive of all knowledge as resting on a single set of principles of reality, and he also believed that there was a single procedure which he called "dialectic", that both sought out these principles and derived all other truths from them. Aristotle's hostility to such a unified notion of science is familiar; I want to suggest here that it comes close to the criticism that Plato did not understand the difference between logical and empirical truth.[10]

In the *Sophist,* Plato discusses five "greatest kinds" and tries to determine which ones "associate" (*koinōnein*) with each other and which do not. We could, of course, interpret this as conceptual analysis and assimilate this to logic, so that Plato's results here would have no real empirical content. However, the discussion does not make use of any concept of grammatical form; rather, it is very much like the analysis of the relations of The Hot and The Cold, Fire and Snow in the *Phaedo.* In other words, there is no reason for separating the question whether The Same associates with Motion from the question whether Fire accepts Cold. Now, even the latter *can* be understood as a conceptual matter, but Plato appears to regard it simply as a question about how the world works. There is no separation here between logical and physical truths; we simply have various necessary principles. Again, Aristotle's evidence concerning Plato's "unwritten" philosophy suggests that Plato wished to derive explanations for everything from what appear to us to be highly abstract logical or mathematical notions. On a few occasions, Aristotle directly accuses the theory of Ideas of resting on such empty "verbal arguments" (e.g. *Met.* Λ1, 1069a 26-28; *Eth. Eud.* A 8, 1217b16-21; and especially *De Gen. et Corr.* A 2, 316b5-14). Against this background, Aristotle's distinction between the peculiar principles of the sciences and the *koina* dealt with by dialectic becomes a criticism of Plato's failure to recognize the difference between logic and science: Plato failed to see that the universality of dialectic rested precisely on its emptiness, an emptiness which Aristotle perhaps conceived in a manner reminiscent of modern notions of logical truth.

I conclude from all this that we cannot really make much sense of "Plato's logic". We can study the patterns of his arguments and offer generalizations about his argumentative practice. We can also study his criticism of arguments to determine what things seemed to him to be similar in form, and perhaps this gives some basis for ascription to him of some implicit notions of logical form. I do not see, however, how we can make any meaningful separation between logic and science (or, to use Plato's word, philosophy) from Plato's perspective.

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NOTES

[1] I.M. Bochenski, *Ancient Formal Logic* (Amsterdam: North-Holland, 1951), pp. 17-18.

[2] I.M. Bochenski, *A History of Formal Logic*, tr. I. Thomas (Notre Dame, 1961).

[3] W.V. Quine, *Philosophy of Logic* (Englewood Cliffs, N.J.: Prentice-Hall, 1970), p. *xi*.

[4] Thus, on my use of the word "form" here, there is no such thing as "the" form of a given sentence. Although this concept of logical form is fairly customary, one might also wish to make use of a more restricted notion according to which two statements (or arguments) have the same logical form only if they differ *only* in their non-logical parts.

[5] For some discussions of the difficulties, see R.E. Allen, *Plato's "Euthyphro" and the Earlier Theory of Forms* (London: Routledge & K. Paul, 1970); S. Marc Cohen, "Socrates on the Definition of Piety: *Euthyphro* 10A-11B," in *The Philosophy of Socrates*, ed. G. Vlastos (Garden City: Anchor, 1971), pp. 158-176; Richard Sharvy, "*Euthyphro* 9D-11B: Analysis and Definition in Plato and Others," *Nous* 6 (1972): 119-137; Paul Woodruff, *Two Studies in Socratic Dialectic: The* Euthyphro *and the* Hippias Major (Princeton, N.J.: Princeton University Press, 1973).

[6] An extended discussion of this can be found in G.E.R. Lloyd, *Polarity and Analogy* (Cambridge, Mass.: Cambridge University Press, 1971).

[7] *Met.* 10; Alexander takes *ta akra en genei* as a standard definition.

[8] If only one of the properties has a contrary, the situation is a little more complicated in ways that we need not discuss here. Actually, Aristotle already realizes that contraries are a little ill-behaved in this respect in the *Topics* (cf. for instance *B*8, 113b27-30, 114a1-6); in the *Analytics* contradictories assume a much more important role, probably at least in part because they are much better behaved. But this is Aristotle, not Plato; and in any event, Aristotle's evidence is not evidence simply against the principles in question being *logically* true, it is evidence against them being true *at all*. And, in any event, none of this gives us any hint about Plato's way of conceiving the principle.

[9] This subject is discussed by T. Irwin in "Aristotle's Discovery of Metaphysics", *Review of Metaphysics* 31 (1977-78): 210-229. See also G.E.L. Owen's influential study "Logic and Metaphysics in Some Earlier Works of Aristotle", in *Aristotle and Plato in the Mid-Fourth Century*, eds., Owen and Düring (Göteborg, 1960), and Irwin's more recent "Homonymy in Aristotle", *Review of Metaphysics* 34 (1980-81); 523-544.

[10] I have developed, and in a number of respects changed, the arguments in this paragraph in later presentation, including "Logic and Logical Truth in Aristotle" (American Philosophical Association, Western Division, Columbus, 1982) and a currently unpublished manuscript.