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SYMPOSIUM

LOGICAL TRUTH

I. LOGICAL TRUTH AND LOGIC

IT is sometimes treated as a commonplace in contemporary philosophy that recent empiricism has happily succeeded, where traditional empiricism had signally failed, in disposing of a difficulty that had long been a source of acute embarrassment to empiricists—viz., what to do about the so-called truths of logic (and of mathematics). For one could hardly go along with Mill's suggestion that such truths were really nothing but empirical or inductive generalizations. And yet the only alternative seemed to be to concede the very point that rationalism had always insisted upon, viz., that in mathematics and logic we achieve a type of knowledge that is absolutely necessary and hence undeniably *a priori*.

How neat, therefore, would seem to be the stratagem of many recent empiricists, to concede the necessary and *a priori* character of mathematical and logical truths, but to follow this up immediately with the insistence that such truths provide us with no factual knowledge, and even in a sense don't really say anything or give any information. Thus, as one recent textbook writer has put it, "If someone said, 'Black cats are fierce,' or 'Black cats bring bad luck,' one might question whether his statement was true; but probably no one would question that, whether true or false, it is a genuine statement. However, if someone said, 'Black cats are black,' we might be tempted to say that he was saying nothing, or that he was saying something true but so utterly trivial as to be not worth saying."<sup>1</sup>

Moreover, the same writer continues by remarking that such statements are, of course, analytic in the sense that "you have only to *analyze* a statement of this kind in order to know whether or not it is true."<sup>2</sup> Moreover, "the reason we don't have to test [such truths] by observation of the world, and the reason they are necessary, is simply that they are empty of any real content; they are all analytic or tautological."<sup>3</sup> In other words, they don't really tell us anything about the things or entities which they would ostensibly seem to be about. "Black cats are black" does not tell us anything about black cats. Or as Wittgenstein put it,

<sup>1</sup> Hospers, John, *An Introduction to Philosophical Analysis*, New York, 1953, p. 90.

<sup>2</sup> *Ibid.*

<sup>3</sup> *Ibid.*, pp. 106-107.

"I know, e.g., nothing about the weather when I know that it rains or does not rain."<sup>4</sup>

Now the question which I should like to raise is whether this hard-won and much-vaunted notion of logical truth, as being at once purely formal, analytic, tautological, etc., and at the same time quite bare of content, non-factual, uninformative, etc., is really much of a gain for logic. Is it particularly pertinent to logic, and does it really further our understanding of the nature of logic? Indeed, in answering such questions in the negative, I should be inclined to go so far as to propound a paradox to the effect that if such be the nature of logical truth, then no logical truth can ever be a truth about logic.

And by way of explanation, let me begin by suggesting what is doubtless a naive, but nonetheless alternative view of the nature of logical truth. For why not consider that expressions like "logical truths" or "truths of logic" simply signify truths that are about<sup>5</sup> logic or have to do with things logical, in much the same way as the expression "truths of chemistry" would ordinarily be taken to mean simply truths that are about chemistry or that have to do with things chemical? Understood in this sense, the truths of logic would be truths about such things as predicates, functions, arguments, quantifiers, disjunctions, syllogisms, etc. In short, they would be second order truths and would involve second order notions, in contrast again, say, to the truths of chemistry which would presumably consist of first order statements and notions about things in the real world.

But no sooner are "truths of logic" understood in this sense than they would seem to be anything but empty and contentless. Nor, for that matter, would they even seem to be on the order of analytic and necessary truths.

Consider, for example: "Linguistic expressions have intension and extension"; "Declarative sentences may be either true or false"; "Any statement as to what a thing is requires the use of a universal concept as predicate"; "No proposition may be said to imply another, if when the first is true the other is false." Would one call such statements,<sup>6</sup> supposing them to be true, necessary

<sup>4</sup> *Tractatus Logico-Philosophicus*, 4.610.

<sup>5</sup> Since I shall repeatedly be speaking of what it is that various statements or assertions may be said to be about, perhaps I had better explain that I understand such "aboutness" in neither a sophisticated nor a Pickwickian sense. So far as I can tell, my use of this expression is not unlike Manley Thompson's (see his "What Are Law-Statements About?," this JOURNAL Vol. LII (1955), No. 16, pp. 421-433).

<sup>6</sup> Of course, one might insist that these examples are not statements at all, but rules. However, as is well known, it is not always easy to avoid a certain

truths, in the sense that their opposites are simply inconceivable? And as for their being uninformative, there could surely be no denying the fact that all these statements purport to give definite information about various logical instruments and devices—sentences, universals, implicative relations between sentences, etc.

But does not this serve to confirm the paradox suggested earlier? For if logical truths are truths about logic, then so far from being merely formal statements devoid of content, logical truths would rather seem by the very nature of the case to be truths about a particular subject matter—viz., about logical or linguistic entities, or objects of second intention as the Scholastics would call them. On the other hand, on the alternative and still fashionable view of logical truth as comprising mere empty formalisms and tautologies, all such truths, being devoid of content, could not be about anything at all, much less about a particular subject matter which could be said to be the proper subject matter of logic as distinguished from other sciences.

Perhaps, though, I have exaggerated this paradoxical divorce of logical truth from logic, on the view that I am here criticizing. Accordingly, let us consider an example of a so-called "logical truth" which would certainly be admitted to be such by nearly all contemporary logicians and which at the same time would be recognized as being in the nature of a purely formal or analytic truth.

No unmarried man is married.

As Professor Quine explains it, "The relevant feature of this example is that it not merely is true as it stands, but remains true under any and all reinterpretations of 'man' and 'married.' If we suppose a prior inventory of *logical* particles, comprising 'no,' 'un-,' 'not,' 'if,' 'then,' 'and,' etc., then in general a logical truth is a statement which is true and remains true under all reinterpretations of its components other than the logical particles."<sup>7</sup>

Very well, supposing that "No unmarried man is married" is a logical truth, just what is it a truth about? My own inclination, of course, would be to say that it is about unmarried men. But at once this will be recognized as hopelessly naive. For, as Professor Quine has so carefully pointed out, the relevant feature of

seeming arbitrariness when one makes the pronouncement that a certain expression that looks like a statement is really a rule. Besides, probably no one would maintain that logic is made up entirely of rules. Hence it should always be possible, at least in principle, to find examples of truths of logic that would illustrate the point that is here at issue.

<sup>7</sup> See "Two Dogmas of Empiricism," in *From a Logical Point of View*, Cambridge, 1953, pp. 22-23.

this example is precisely that it is not a statement that is merely true as it stands, but rather a statement that "remains true," regardless of whether its components be "unmarried men," "incompetent logicians," or "inane investigations." Presumably, therefore, it must be regarded as a purely formal statement, and hence as not about any determinate subject matter at all. In other words, it says nothing and gives no information about anything whatever.

Just the same, there does seem to be something about this last conclusion that is far from cogent. For granted that in the case of "No unmarried man is married," we can vary "married man" and "married" without limit and still not affect the truth of the statement, does it necessarily follow that the statement just says nothing at all and gives no information whatever? For why could not one argue that the possible variability of the non-logical components of the statement merely serves to indicate that the truth involved in the original statement is one that holds not just of unmarried men, but of anything and everything whatever? And what is this truth? Simply that nothing whatever is other than what it is. And with this our supposed example of a logical truth begins to take on the aspect of an ontological truth! However, since even to breathe the word "ontological" is to court almost certain philosophical arrest and execution at the present time, I shall advisedly refrain from pressing this particular point.

To return, though, to our example of a logical truth. May we accordingly conclude that since it is not a truth about unmarried men, indeed, since it is not a truth about anything at all, it cannot possibly be a truth about logic or about logical entities and relations? In short, does the very fact that it is a truth of logic rule out any possibility of its being a truth about logic?

But at once, everyone will recognize that something is wrong with this picture. For almost all modern logicians seem to feel that mere formal truths and tautologies are of significance for logic. Perhaps the point is that truths of this sort somehow exhibit or show forth the purely logical or linguistic forms and structures of our thinking behavior; and as such, these logically true or formally true statements could then properly be regarded as second order statements. Indeed, the very way in which Quine explained the notion of logical truth in the above quotation might be said to focus attention upon the peculiar concern of such truths with what Quine calls "logical particles." Thus "No unmarried men are married" may not tell us anything about unmarried men, or for that matter about any real persons or things. And yet does it not shed light on the use and behavior of logical particles like 'no,' 'un-,' 'are,' etc.?

Yet once more, it would seem that we must tread warily here. For is one to say that any merely formal or analytic truth, being thus a second order statement, is for that reason nothing more than a statement about its own logical particles? Is "No unmarried men are married," for example, a statement not about unmarried men or about anything else in the world, but only about 'no' and 'un-' and 'are'? Now I do not know of any logician who would say quite this in so many words, but there are many who would come very close to implying it in practice. And yet is not such a view simply ridiculous on the face of it? For one thing, it is bad enough to be told that, when we say "No unmarried men are married," we are not talking about unmarried men at all; but to have it insinuated, in addition, that we are actually only making a statement about 'no' and 'un-' and 'are' is downright insulting. What's more, so to interpret the meaning of the statement would seem to involve the most elementary confusion of use with mention, for while the statement in question most certainly contains the logical particles 'no,' 'un-,' and 'are,' it is certainly not for that reason a statement about such particles.

Of course, Mr. Strawson<sup>8</sup> has a somewhat ingenious, even if, as I should think, a rather cavalier, way of meeting this difficulty. For he in effect seems to say that although a statement like "No unmarried man is married" is ostensibly a first order statement, it is really a *disguised* second order statement. More specifically, he develops his contention in the light of the following examples:

- (1) The statement that he is over six foot tall is inconsistent with the statement that he is under six foot tall.
- (2) He is not both over and under six foot tall.
- (3) He *can't* be both over and under six foot tall.
- (4) It's *impossible* for him to be both over and under six foot tall.

In analyzing these statements, Strawson maintains that (2), (3), and (4) are all misleading: they look like first order statements, but they really aren't; they are disguised second order statements. Presumably, therefore, anyone making either statement (2), (3), or (4) does not quite mean what he says or say what he means. For, stripped of their disguises, (2), (3), and (4) actually assert no more than what is stated in (1).

Now with all due respect to Mr. Strawson, it does seem that

<sup>8</sup> Cf. *Introduction to Logical Theory*, London and New York, 1952, chs. 1 and 2, esp. pp. 21-22 and 35. Needless to say, I have no confidence that I have rightly interpreted Strawson here, his style being so opaque at times as to afford him protection against almost any criticism.

there is something rather arbitrary and even high-handed about this procedure. For how can he be so sure that ever so many of the ordinary statements we make, thinking that we are making them about persons or things, are really not about what we think they are at all, but are instead mere disguised second order statements? Why, on this basis it might turn out that henceforth, so far from an Englishman's house being his castle, not even his meaning would be what he means. For just which of the statements that we make can we ever be sure will be free from exposure by some self-appointed watcher and warder of ordinary language? Thus the satirist may think that he is making an observation about human nature when he declares that fools rush in where angels fear to tread. But no, he may be told that he is not talking about human nature, but only about his own use of language. And the scientist who thinks he is talking about physical phenomena when he says that light travels in straight lines may actually be told that he is only a disguised and even hypocritical lexicographer. Yes, even Strawson himself may find that when he wishes to state it as a fact that all analytic statements are really second order statements, he may rudely be told that he is only trying to foist his own dictionary upon an audience of unsuspecting and uninformed philosophers!

Moreover, pleasantries aside, there would seem to be an order of priority and posteriority in first and second order statements that simply cannot be removed by any mere ripping off of so-called disguises. To be sure, there is not a single first order statement of any kind but what it may lend itself to description and characterization in a second order statement. This is quite as true of synthetic statements as it is of analytic statements. Thus the statement

(5) Theaetetus sits

can be quite legitimately described in a second order statement

(6) The concept "sitting" is affirmed of the subject "Theaetetus."

But the point, of course, is that the second order statement is another and quite different statement from the first order statement which it is about. Nor would one ever suppose that in asserting that Theaetetus sits, one was really only asserting (6). Quite the contrary, (6) presupposes (5). Nor can one readily see how the case could be any different with first and second order analytic statements from what it is with synthetic ones—at least so far as the necessary priority of the one order over the other is concerned.

Nevertheless, for purposes of argument, suppose we waive this difficulty and simply assume that any seemingly first order analytic or logically true statement is really a disguised second order statement about some logical or linguistic use or other. Almost at once, this assumption will have hard going in the face of concrete examples of logical and linguistic uses. For statements about such things just don't seem to have the character of analytic or so-called logical truths at all. For instance, consider such things as negative terms and negative sentences, function terms and argument terms, the syllogistic form of argument, hypotheticals, double negatives, *et al.*—all of these are nothing but so many logical or linguistic tools that we human beings employ in our efforts to know and to communicate our knowledge. Moreover, in so far as we try to understand these tools themselves—what their functions are and how they are to be used—we must make statements about them just as we make statements about anything else that we are seeking to know and understand. Nor would there seem to be any reason *a priori* why such statements must needs be formal or analytic truths. To be sure, as second order statements, they are statements not about real persons or things, but only about our own logico-linguistic tools. But what of that? Don't we have to try to learn about the nature and behavior of such tools, just as we learn about the nature and behavior of other "things"? And if so, will not the statements we make about them be more in the nature of synthetic propositions than analytic ones, to say nothing of being informative rather than purely formal?

But let us not merely cite examples of second order statements which are not in the nature of formal or analytic truths at all. Let us actually try the experiment of interpreting a formal or analytic truth as a second order truth. This may suffice to show that the two sorts of truth are radically incompatible with each other.

Thus take once again a statement such as:

No bachelor is married.

This, let us suppose, is an analytic or a logically true statement. But this means simply that the statement is really not about bachelors at all, since it will remain true under all reinterpretations of its components other than the logical components. Indeed, the statement is really, we might say, one involving a complete "subject-matter-indifference,"<sup>9</sup> which we might represent thus:

No A is non-A.

<sup>9</sup> This expression is Strawson's, *op. cit.*, p. 48.

But this last statement, as we have seen, is supposed to be regarded as a second order statement which is not about things at all, but only about the relevant linguistic and logical devices that we use to talk about things. Accordingly, suppose we rewrite it as follows:

No predicate which is the contradictory of its subject may be affirmed of that subject.

This last statement, however, is also said to be an analytic or logically true statement. But no sooner does one say this, than the same analysis will pertain to it that was seen to pertain to the original statement, "No bachelor is married." That is to say, the same principle of "subject-matter-indifference" must apply to it that applies to any analytic or formal truth. Hence, just as the earlier statement seemed to be about bachelors but turned out not to be so at all, so also this latest statement might seem to be about predicates that contradict their subjects, but it really isn't so at all. Likewise, just as "No bachelor is married," being analytic, really said no more than "No bachelor is other than a bachelor," and hence "No A is non-A," so also "No predicate which contradicts its subject may be affirmed of that subject" really says no more than "No predicate which contradicts its subject is other than a predicate which contradicts its subject." But this simply means that our last statement which was presumably a second order statement about certain kinds of predicates, as distinguished from other things, turns out not to be about anything that can be distinguished from anything else at all. In other words, it can in no sense be said to be about logical or linguistic or second order elements as distinguished from things that are objects of first order notions. But then it cannot even be said to be a second order statement!

Where, then, does this leave us? Well, if one still wishes to indulge one's taste for paradox, one can simply say that logical truths, being logically true, cannot possibly be truths of or about logic; and, vice versa, the truths of logic, being second order truths about logical devices and relationships, cannot possibly be logically true. Or to put it more straightforwardly, it would seem in the light of the foregoing arguments that there is a radical incompatibility between so-called analytic, formal, or logical truths and the properly second order truths of logic. And may we not simply conclude from all this that the whole notion of so-called logical truths, in the sense of formal or analytic truths, has no pertinence to logic whatever? They are not truths about logic or logical particles or logical relations or anything whatever having to do with logic; indeed, if they were, they would immediately and

*eo ipso* cease to be statements that were formally or analytically or logically true.

Just the same, one might rejoin with the question: What then is one to do with such logically true statements? Admitting that they have no pertinence to logic, they nonetheless exist. What, then, is one to say about them? Well, one might say that maybe the whole idea of formal or logical truth is simply a delusion, that all so-called formal or analytic truths really are informative and do say something, be it trivial or not, and that what they say something about are nothing other than the very things which these same statements are ostensibly about. Thus "No thing other than A is A" might be taken to be a statement about things generally. And "No predicate may be affirmed of its contradictory opposite" would be a second order statement about properly logical entities and relationships. Yes, even "No unmarried men are married," I am afraid I must confess, should be regarded as being a truth about unmarried men, its truth being derivative from the more general ontological principle that no thing other than A is A.

"But," you will say, "is not this right where we all came in at the very dawn of contemporary philosophy? Indeed, if seemingly necessary truths are not to be regarded as purely formal, but as factual, then will we not be confronted with the same old difficulties of traditional empiricism all over again?" To all of which I can only reply that if one finds oneself in a blind alley, going back to where one came in may not be such a bad idea after all.

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## II. TWO PROBABILITY CONCEPTS

SOME ten years ago Rudolf Carnap distinguished between two probability concepts: the concept of degree of confirmation, which he labeled probability<sub>1</sub>, and the concept of relative frequency, which he labeled probability<sub>2</sub>.<sup>1</sup> I propose to draw here a related, but different, distinction between probability as a generalized truth-concept and probability as a generalized implication-concept. For purposes of clarity I shall denote the first concept by 'prob<sub>T</sub>', the second by 'prob<sub>I</sub>'. Of my two concepts or *explicanda*, prob<sub>I</sub> is the same as Carnap's probability<sub>1</sub>, but the *explicatum* I shall submit for it coincides only partly with Carnap's favorite *explicatum* c\*; as for prob<sub>T</sub>, it differs from Carnap's probability<sub>2</sub>,

<sup>1</sup> "The Two Concepts of Probability," *Philosophy and Phenomenological Research*, Vol. V (1945), pp. 513-532.