ON UNIVERSAL TESTS FOR THE TRUTH OF WORLD VIEWS: THEIR EXISTENCE AND IDENTIFIABILITY

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Abstract.

In his book, Christian Apologetics, Norman Geisler proposes a universal test for the truth of world views. We examine this concept and find that it raises serious difficulties. This paper first presents some basic definitions for "world view" and "truth-value of a world view," then studies the concept of a universal test for the truth of world views in light of these definitions. Geisler has proposed what amounts to a universal decision procedure to determine the truth-value of world views. We show that, in the general case, no such universal decision procedure exists. Whether or not such universal tests for truth exist within the framework of apologetics depends on the language and the domain of discourse, but given the broad nature of the subject matter of apologetics, it is highly unlikely that they do exist. Finally, we consider the problem of identifying a universal test for truth, assuming that one does exist, and prove that there is no guarantee that such a universal test for truth can ever be known, within the bounds of natural reason, by proving that there is no decision procedure to test for universal tests for truth. These results lead to an "open problem" which we pose for apologists.

This paper makes use of new discoveries in logic spearheaded by Godel's landmark "Incompleteness Theorem" in 1931. Since Aristotle, we have been learning that there are limits on the nature of truth. The recent discoveries in logic have shown that there is a difference between truth and the knowledge of truth, and that there are also limits on the nature of knowledge. The limits have nothing to do with who knows, but with how the knowing is done. The structure of knowledge turns out to be such that, for most (but not all) general systems of truth broad enough to include even the elementary truths of human experience, there is no effective procedural way to know all the truths in such systems as true. It appears that God has not only carefully ordered and structured truth, but He has also placed some fundamental limits on the nature of unaided human knowledge.

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1. Introduction.

In the literature of Christian apologetics, the intriguing concept of a "test for truth" of world views has appeared. Since the "test" has been treated as a universal decision procedure applicable to all world views, the concept is in fact that of a "universal test for the truth of world views."[1] Such a concept requires very careful examination. If it is legitimate, it is extremely powerful, and if it is not, no arguments based upon it are reliable. It is the purpose of this paper to examine this notion, "universal test for the truth of world views." Do such tests exist? If so, can we know them?

It turns out that such universal decision procedures rarely exist, except in highly artificial environments, and we will argue that, in all likelihood, they do not exist in the broad realm of Christian apologetics. Our arguments will make use of results in logic from the 1930's, due to Kurt Godel and Alonzo Church. Some of these results are counter-intuitive, and it is absolutely necessary for anyone dealing with decision procedures to understand their implications, in order to avoid fallacies or vacuous conclusions.

2. Preliminary Remarks and Definitions - Just What Is a World View, and When Is it True?

Unfortunately, there is an immediate difficulty with doing a careful study of this concept: the literature contains no generally accepted definitions for the terms "world view," "truth-value of a world view," or "test for truth."[2] Since a precise definition of these terms is essential to a critical analysis, as well as to any careful rational apologetics, we must first get the definitions down.

One common property of all so-called "world views" is that they make statements about the world. And the statements are all claimed to be either true or false. Furthermore, there is an underlying assumption in philosophy of this kind, that every proposition has a unique truth-value, whether we know it or not, and whether or not we agree on what it is. In other words, it is tacitly assumed that there is some sort of "universal semantics," which assigns a unique truth-value to every proposition. Accordingly, we can consider the following very general definition for a world view:

Definition. A world view, whatever else it is, is a finite collection of propositions, together with a semantics, which, whatever else it does, assigns in an effective way[3] a unique truth-value (i.e., either the value "True" or the value "False") to every proposition in the world view. In addition, the semantics assigns, in an effective way, a unique truth-value to every proposition deducible from propositions in the world view, according to the ordinary rules of logic.[4]

As to the truth-value of world views, we first make the following quite reasonable assumption: the truth-value of a world view is independent of any method for testing, or "figuring out" what that truth-value is. In other words, no valid test for the truth-value of a world-view can change that truth-value. So, we must give a definition for the truth-value of a world view. The following seems reasonable:

Definition. A world view is **true** just in case every proposition it contains is true. Otherwise, it is **false**.

This model (of a world view as a finite set of propositions, together with a normative semantics) is clean and general. And it is indeed difficult to think of any serious competitors to this definition of their truth-value.

With these definitions out of the way, we may procede with the examination.

3. Some Preliminary Theoretical Results Relevant to World Views.

3.1. Obvious Results.

Assuming a "universal semantics," since the rules of ordinary logic provide a consistent system, the following results are fairly immediate. It seems fair just to point them out, without proof.

(1) Every proposition deducible from a true world view, according to the rules of a sound and consistent logic, is true. (2) The union of two true world views is a true world view. (3) If a world view is false, then any world view containing it is false.

One could also define mutually contradictory world views as follows: World view A contradicts world view B just in case A entails one or more propositions contradicting propositions entailed by B. Then the following additional property is provable from (1):

(4) The contradiction of a true world view is a false world view.

From (4) it follows that true world views are not mutually contradictory and that if two world views are mutually contradictory, at least one, and possibly both, are false. This model also gives rise to well-definable measures for the "desirablilty" of world views, viz. relevance, comprehensiveness, etc.

3.2. Some Serious Questions.

Within the framework of these definitions, we can examine the notion, "test for truth of a world view," as a decision procedure. There are three important classes of procedures to be considered: First, there are tests for truth which partly do the job -- they correctly tell us the truth-value of some world views. Second, there are tests for truth which wholly do the job -- they correctly tell us the truth-value of all world views. This is the kind of test we are calling a universal test for truth. Let us call the first kind a partial test for truth. The universal test has the property that for every world view, W, the test tells us whether W is true or false, and the partial tests have the property that for some world views, they tell us they are true or false, but for others, they don't tell us anything at all.

But there is also in some literature, a third claim: that we are not only testing world views, but also testing tests for truth, to see which are better, and above all, to see if we can find one which is universal. Indeed, a well-known apologetics uses this argument to dismiss other world views, on the grounds that they contain only partial tests, and to proffer itself, claiming to present a universal test for truth.[5]

In the remainder of this paper, we will study two questions, within the framework of natural logic. First, do such universal tests for truth exist, and second, if they do, can we know them?[6]

3.3. Technical but Critical Details.

We need to make two more observations about tests for truth before proceeding with the arguments. First, a remark about the nature of a test as a procedure. The notion of a "test" carries with it the implication that a test for truth is some sort of process or procedure which a person can apply in a step-wise fashion, to any world view, to determine its truth-value. In common mathematical-logical parlance, a test for truth, whatever else it is, is a "decision procedure." All that we mean by a test for truth being a decision procedure is that it is composed of a finite set of rules, each a step to be performed in an orderly fashion, with the property that each step in the process, although it might (or might not) take great intellect actually to perform, and although it might (or might not) take an extraordinary amount of time, nevertheless is guaranteed eventually to run to completion and lead to a clear choice of the next step in the procedure to take. Valid steps in such a procedure might be "Find the first variable, if any, in the first proposition of the world view." An invalid step would be "Find the first constant satisfying the first formula, then . . ." (Since there might not be any such constant, this step would never end.) An important fact about decision procedures is that not all of them lead to definite conclusions (something most of us have suspected since we climbed out of the crib). Indeed, this is why most tests for truth are partial.

The second observation is a not-too-obvious, but simple, fact about world views and propositions. It is not necessary to use this fact, but it makes the arguments presented later in this paper much easier. There is a straightforward relationship between world views and propositions: Every proposition is a world view (most of them trivial -- they don't say much about anything) and to every world view W there corresponds a proposition p with the property that p is true if and only if W is true. The correspondence is the following:

Let $W = \{p_1, p_2, \ldots, p_n\}$ be a world view.

Then $p = ((p_1) \text{ and } (p_2) \text{ and } \ldots \text{ and } (p_n))$ is its corresponding proposition.

In other words, p is just the conjunction of the propositions of W. So, to deal with the truth-value of world views, it is sufficient to deal with the truth-value of propositions.[7] A test for propositional truth will give us a test for world view truth, and if one is universal, the other will be.

4. Does a Universal Test for Truth Exist, Within the Framework of Apologetics?

Suppose there is a universal test for the truth-values of world views. Then, due to the correspondence given above, there is a universal test for the truth-values of propositions. By definition, the universal test for truth has the following property: applied to any proposition p the test will eventually tell us either that p is true or that p is false. A set of propositions with this property --that for every member in the set one can effectively decide a certain question about it -- is called a "decidable set," with respect to the question. (Henceforth, we will use the term "decidable" to mean "decidable with respect to truth-value".) In this case, if there is a universal test for truth, then the set of world views, and, correspondingly, the set of propositions used to formulate those world views, is decidable.

A startling result due to Kurt Godel in 1931[8], proved that the set of logically valid propositions of Peano's axiomatic number theory (the ordinary system of numbers we use in everyday life) is not decidable! In 1936 Alonzo Church[9] extended Godel's result to the ordinary Predicate Calculus with universal and existential quantifiers (the usual language in logic for expressing everyday statements which are either true or false). Although the Predicate Calculus is consistent and complete (its set of logically valid propositions is precisely its set of provable propositions), it is not decidable! Subsequently, a number of systems have been proven undecidable. On the other hand, the First Order Propositional Calculus is decidable (the method of truth tables is the usual decision procedure), and recently certain special limited arithmetic systems have been proved decidable.[10]

So, the question is, is the set of world views decidable? Church's result would lead one to be highly skeptical that it is, since the First Order Predicate Calculus with quantifiers (let's call it the FOPCWQ) is such a general model of the language used for making claims of truth and falsehood, such as the language of apologetics. The final answer depends on what precisely the language of apologetics is, but it is highly unlikely that it is substantially different from the FOPCWQ. However, before a final answer can be given, we must decide exactly what form the language of apologetics has, since, as we have already seen, some languages are decidable and others are not. It is possible, but highly unlikely, that apologetics in the general sense is sufficiently limited in its nature to permit universal tests for truth. This depends on very precise definitions of the language and domain of discourse of apologetics.

5. An Open Problem for Apologists.

We have seen that in the general case, universal tests for truth do not exist, but that for any specialized discipline, the issue really depends on the precise nature of the language of that discipline.

Therefore, we pose the following open problem: **What precisely is the correct model for the language of rational apologetics?**

And here are some considerations:

Any language not containing quantifiers, such as the First Order Propositional Calculus (which is decidable), is certainly too narrow -- it is too weak even to permit statements such as, "All have sinned and fallen short of the glory of God."

It seems clear that every finite set of propositions in the FOPCWQ constitutes a world view. An apologetics which did not allow all such world views would be so restrictive as to be unconvincing. So, the language of world views should include the FOPCWQ. On the other hand, can every world view be formulated as a finite set of propositions in the FOPCWQ? If so, then we have our answer: the FOPCWQ is the correct language model, and, since it is undecidable, there are no universal tests for truth for apologetics. But if there is some other language for world views which contains the FOPCWQ, then the answer depends on whether that language is decidable or not.

What kind of a world view could not be formulated in the

FOPCWQ? One issue that comes to mind is the concept of "belief." Can the concept of believing be formulated in the FOPCWQ? If not, what additions to the FOPCWQ are required? What effect does this have on the existence of universal tests?

One final remark: the undecidability of a subset of a language does not *a fortiori* make the language undecidable, so it is possible that the language of apologetics contains the FOPCWQ and is decidable. However, this is extremely unlikely, since decidable supersets of undecidable languages generally contain *less* discriminating power than their undecidable subsets, not more. It is not likely that a superset of the FOPCWQ which does not permit all the distinctions of the FOPCWQ would be an adequate language for apologetics, and in this sense, it is not likely that the set of world views in the language of apologetics is decidable.

The point of this section, then, is just this: In the general case, universal tests for the truth of world views do not exist. It is not known whether they exist within the language of apologetics. This open question depends on the precise nature of the language of apologetics, which is an open problem requiring considerable research and argument among the practitioners of apologetics. Until the answer to this open question is known, any apologist claiming the existence of such a universal test must *prove* that his definition is well-formed and that the test actually exists. If he does not, any conclusions he draws from the assumption that the test exists, and any arguments based upon it, are unreliable.

6. The General Unrecognizability of a Universal Test for Truth.

Next, we turn our attention to the following question: Suppose a universal test for truth exists. Can we recognize it? Here, there is a proof. For the models of world view (finite sets of propositions with a "universal" semantics) and test for truth (effective procedure) which we have adopted, the answer is, there is no guarantee that any *one* universal test for truth will be recognized as such. Furthermore, we can't recognize them all.

Since the argument in this section is difficult to follow, we are presenting it in two forms. First (in this section) in English, with a minimum of formal notation. Next (in the next section) a formal argument is given, for those who want a more rigorous proof.

To begin with, consider a test for truth and the responses it can give. If a test T is used to examine a world view W, one of three results must ensue: Either T will stop and say "True", or it will stop and say "False", or it will not answer at all (recall that there are partial tests for truth). That is, any test for truth can result in exactly one of three things: it can lead us (correctly, if it is a good test) to say "True" of the world view, or it can lead us to say "False" of the world view, or it can lead us to no conclusion at all about the world view. If it is a test for the truth of world views, it must have one of these three results, and nothing else. Nothing is said about how long we may have to work with the test to get the result, and, of course, one way to get no conclusion at all, is for the test to never end. Of course, if the test happens to be universal, then the third possibility will never occur.

To review, the only possible results of applying a test for truth to a world view are:

- The test outputs "True".
- The test outputs "False".
- The test outputs nothing at all.

Now, suppose we have a "Universal test-for-truth tester." Call it "U." U must be able to verify the correctness of any test for truth, and it must be able to identify any universal test for truth. What this means is that, given any test T and any world view W, U must be able to produce the correct one of the five following possible results:

"ok"	if W is true and T testing W outputs "True",
"ok"	if W is false and T testing W outputs "False",
"not ok"	if W is true and T testing W outputs "False",
"not ok"	if W is false and T testing W outputs "True",
"not universal"	if T gives no response for W.

Now it is possible to construct some other procedures from U. First, we can construct the procedure, U′, which works as follows: U′ works just like U, except that it outputs a "1" whenever U outputs either "ok" or "not ok", and U′ outputs a "0" whenever U outputs "not universal". That's easy enough to do -- a slight translation of the output of U is all that's needed. Of course, U′ does not pretend to be a universal test-for-truth tester (it doesn't give the right answers) -- only a procedure. It is easy to see that if U exists, then so does U′.

The next procedure we can construct depends on another point about tests for truth. Each test is assumed to be specified in English, by a finite set of rules (imagine one which did not have a finite set!). And we assume that there is some set of rules which tells one just how to specify the test, so that when we look at a collection of English sentences, we can tell whether it is a real test or not, just by its form. It follows, then, that there is a way to list all the tests in order, so that it is legitimate to talk about the "first" test for truth, the "tenth" test for truth, ..., the "nth" test for truth, and so forth. The proof of this result is easy, and well-known in formal language theory. See the next section for details. Of course, the list is infinite, but the point is, for each integer n, one can legitimately talk about the "nth" test, given the rules for the enumeration. We will use this fact to make it easier to talk about arbitrary tests for truth in a bunch of such tests.

In fact, let us just call all our tests for truth,

T1, T2, T3, ..., Tn, ...

Similarly, the world views may be listed:

W1, W2, W3, ..., Wn, ...

One must be careful not to think that these listings for tests and for world views represent some kind of unique order. There is no special test for truth which should be number one, and no world view which, so far as our argument goes, is a special number one. Any order will do. The only important thing is that such orderings exist.

Now we can construct some more procedures from U'. First, we can construct the procedure U'' with the following property: Given a world view Wi, U'' outputs whatever U' outputs for the combination of test Ti on Wi. Note that since every world view is in our list of world views, then U'' is defined on all world views. It simply takes the world view W we are applying it to, checks to see which world view it is (say,the ith world view), and then does whatever U' does for the test Ti on Wi.

The final procedure we construct is U''', constructed from U'' as follows: U''' operates just like U'', except that whenever U'' goes to output a "1", U''' is fixed so that instead of giving any output, it begins an endless repetition of steps which never lead anywhere. This has the effect of making U''' run "forever". And whenever U'' would output a "0", U''' outputs "True".

To see that this construction is actually very simple, suppose U'' has the following step:

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                .
                .
                .
     step n:    Output "1" and stop.
                .
                .
                .
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Then U''' would have the following step in its place:

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                .
                .
                .
     step n:    Repeat step n.
                .
                .
                .
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And, of course, if U'' has the following step:

.
.
.

step n: Output "0" and stop.

.
.
.

Then U''' would have the following step in its place:

.
.
.

step n: Output "True" and stop.

.
.
.

Such a step as the second one above (the "Repeat" step) is, of course, silly, but that is beside the point. It is not important that it is meaningless. For the sake of our argument, it is sufficient that it can exist.

To recapitulate, we have the following sequence of procedures:

U, which for any test T and any world view W, yields:

"ok"	if W is true and T testing W outputs "True",
"ok"	if W is false and T testing W outputs "False",
"not ok"	if W is true and T testing W outputs "False",
"not ok"	if W is false and T testing W outputs "True",
"not universal"	if T gives no response for W.

U', which for any test T and any world view W, yields:

"1"	if W is true and T testing W outputs "True",
"1"	if W is false and T testing W outputs "False",
"1"	if W is true and T testing W outputs "False",
"1"	if W is false and T testing W outputs "True",
"0"	if T gives no response for W.

U'', which for any world view W, where W is in fact the ith world view, yields:

"1"	if W is true and Ti testing W outputs "True",
"1"	if W is false and Ti testing W outputs "False",
"1"	if W is true and Ti testing W outputs "False",
"1"	if W is false and Ti testing W outputs "True",
"0"	if Ti gives no response for W.

U''', which for any world view W, where W is in fact the ith world view, yields:

nothing	if W is true and Ti testing W outputs "True",
nothing	if W is false and Ti testing W outputs "False",
nothing	if W is true and Ti testing W outputs "False",
nothing	if W is false and Ti testing W outputs "True",
"True"	if Ti gives no response for W.

Now note that U''' is a procedure which, when applied to world views, always yields either the output "True", or nothing at all. But then, U''' is, in fact, a (possibly very bad) test for truth! So, then it must be in our list of all tests for truth, i.e., there is some number k, such that U''' is the kth test for truth. I.e., U''' = Tk. Then, consider what U''', alias Tk, yields when applied to the kth world view Wk:

U''' (alias Tk)	applied to Wk yields "True"
just in case U''	applied to Wk yields "0"
just in case U'	applied to Tk (alias U''') testing Wk yields "0"
just in case U	applied to Tk (alias U''') testing Wk yields "not universal"
just in case Tk (alias U''')	applied to Wk yields nothing.

On the other hand,

U''' (alias Tk)	applied to Wk yields nothing
just in case U''	applied to Wk yields "1"
just in case U'	applied to Tk (alias U''') testing Wk yields "1"
just in case U	applied to Tk (alias U''') testing Wk yields "ok" or "not ok"
just in case Tk (alias U''')	applied to Wk yields "True".

In other words, U''' outputs "True" just in case it never outputs anything (which, of course, can't be). We have deduced a contradiction. Thus, since our argument is valid, the original assumption must be false, i.e., there is no such "universal test-for-truth tester."

This is a very general result! Its generality lies in the fact that, unlike the case for universal tests for truth, it does not depend on the nature of the language being used. This argument applies to the general model of world view and test for truth we are using, which only presupposes that world views are composed of finite sets of (true/false) propositions, and that tests for truth are procedures. It is certainly possible to use a more limited definition for world views and/or tests for truth in which universal tests for tests for truth can be guaranteed to exist and be found. However, an apologetics based on such a limited model would probably turn out to be more limited in scope, and so one would wonder how convincing it would be.

7. A Formal Proof of the Argument in the Previous Section.

The argument in this section is a more brief and formal version of the argument of the last section, for those who prefer the rigor of a formal proof.

We begin with the enumerations of the world views:

$$W1,\ W2,\ W3,\ \ldots,\ Wn,\ \ldots\ ,$$

and tests for truth:

$$T1,\ T2,\ T3,\ \ldots,\ Tn,\ \ldots\ .$$

It is important that these enumerations are <u>effective</u>, in the sense that they can be accomplished by effective procedures. The proof that they are effective is easy, and well-known in formal language theory. There are many possible listings. One goes like this: There are a finite number of letters and punctuation marks in English. So, for any whole number, n, there are a finite number of strings of such symbols having length n. So, there are only a finite number of tests for truth of length n. All we have to do is first list all the tests of length 1 (there may be none), then all those of length 2, then 3, and so on. This process gives an ordering which is guaranteed to list every test for truth exactly one time. A similar procedure works for world views.

The ith test, Ti, then, is a function on world views with the following range:

$$Ti(W_j) = \begin{cases} \text{"T"} \\ \text{"F"} \\ \text{undefined.} \end{cases}$$

Now, we assume the existence of an effective procedure which is a "Universal test-for-truth tester." Call it "U." U represents the following effective function:

Given any test Ti and any world view W_j,

$$U(Ti,W_j) = \begin{cases} \text{"ok"} & \text{if } Ti(W_j)=\text{"T" and } W_j \text{ is true,} \\ \text{"ok"} & \text{if } Ti(W_j)=\text{"F" and } W_j \text{ is false,} \\ \text{"not ok"} & \text{if } Ti(W_j)=\text{"T" and } W_j \text{ is false,} \\ \text{"not ok"} & \text{if } Ti(W_j)=\text{"F" and } W_j \text{ is true,} \\ \text{"not universal"} & \text{if } Ti(W_j) \text{ is undefined.} \end{cases}$$

From U, construct the following effective functions, U', U'' and U''':

$$U'(Ti,W_j) = \begin{cases} 1 & \text{if } U(Ti,W_j) = \text{"ok" or "not ok",} \\ 0 & \text{if } U(Ti,W_j) = \text{"not universal".} \end{cases}$$

$$U''(Wi) = U'(Ti,Wi)$$

$$U'''(Wi) = \begin{cases} \text{undefined} & \text{if } U''(Wi) = 1, \\ \text{"T"} & \text{if } U''(Wi) = 0. \end{cases}$$

The reader should be able to verify that U', U'' and U''' have effective constructions, and thus are well-defined. Note that U''' is a (possibly very bad) test for truth. So, then it must be in our list of <u>all</u> tests for truth, i.e., there is some integer k, such that $U''' = Tk$. Then, we have the following result:

$$\begin{aligned} U'''(Wk) = Tk(Wk) = \text{"T"} \quad & \Leftrightarrow U''(Wk) = 0 \\ & \Leftrightarrow U'(Tk,Wk) = 0 \\ & \Leftrightarrow Tk(Wk) = U'''(Wk) \text{ is undefined, and} \end{aligned}$$

$$\begin{aligned} U'''(Wk) = Tk(Wk) \text{ is undefined} \quad & \Leftrightarrow U''(Wk) = 1 \\ & \Leftrightarrow U'(Tk,Wk)\ 1 \\ & \Leftrightarrow Tk(Wk) = U'''(Wk) = \text{"T"}. \end{aligned}$$

I.e.,

$$U'''(Wk) = \text{"T" iff } U'''(Wk) \text{ is undefined.}$$

This is a contradiction, so the original assumption, that U exists, is false.

8. Conclusion.

Since Aristotle, we have been learning that limits exist on the nature of truth. Most of us believe, for example, the "law of non-contradiction" -- that a proposition cannot be both true and false at the same time and place and in the same sense. What the new discoveries in logic in the 1930's have shown is that there is a vast difference between a proposition being true and in knowing that a proposition is true, and since Godel, we have been learning that there are limits on the nature of knowledge. The limits have nothing to do with <u>who</u> knows, but with <u>how</u> the knowing is done. The structure of knowledge turns out to be such that, for most (but not all) general systems of truth broad enough to include even the elementary truths of human experience, there is no effective procedural way to know all the truths in such systems as true. It follows that in such broad systems of knowledge, there is no effective procedural way for man's unaided intelligence to distinguish truth from falsehood in all cases. It appears that God has not only carefully ordered and structured truth, but He has also placed some fundamental limits on the nature of unaided human knowledge. It may not please some of our intellects, but that is the way God has chosen to structure truth and knowledge, and that is what we have to work with. (Of course, this fact does not rule out the possibility of coming to know truths through revelation or divine illumination, since those processes are not necessarily "procedural.")

The idea of a universal test for truth is tantalizing. But we have seen that one can't go looking for one without being very careful about the haystack in which he is searching. We have seen that if the haystack is any language modelled by the ordinary Predicate Calculus with quantifiers (in all likelihood, the language of apologetics), then there are no universal tests for truth to be found.

We have also seen that, in the unlikely event that the language of apologetics happens to be restrictive enough to admit universal tests for truth, there are still no universal tests for tests for truth -- i.e., there is still no effective procedure for identifying universal tests for truth, or knowing that a given test is a universal test for truth, even if we had one. The arguments in Sections 6 and 7 prove that no procedure exists, within the bounds of natural reason, which can correctly test for the correctness of all tests for truth. And these arguments are independent of the language of world views. Their only restriction is that world views be finite collections of true/ false propositions.

However, the reader should not jump to conclusions. These results do not say that we cannot know any tests for truth (although most of the tests we concoct are likely to be partial). They do not even say that we cannot identify a universal test for truth. What they do say is that (1) one should be very suspicious about any claim to have a universal test for truth, within natural reason -- it depends on the language of the world views one is dealing with. If the language is general enough to include quantifiers, then, in all likelihood, there aren't any universal tests for truth. Only a careful examination of the particulars will tell. And (2) that in any case, there is no procedure for correctly evaluating all tests for truth, with respect to their correctness and universality.

So, the only proper way to proceed with a rationalistic theory of truth is to specify very carefully and precisely the syntactic and semantic domains of the logical world one is developing his theory in. Next, before he can legitimately make claims to search for a universal test for truth, one should demonstrate that such a test exists -- i.e., that the set of entities being tested is decidable with respect to truth-value. Finally, one can not legitimately claim to have a procedure which correctly tests for the correctness of all tests for truth.

As it so often turns out, the way of man's reason has more blind alleys that one would have thought.

NOTES

1. See, for example, Norman Geisler's Christian Apologetics (Grand Rapids: Baker Book House, 1976), Chapter 8, "Formulating Adequate Tests for Truth," p.133 ff. As a crucial part of his apologetics, Geisler uses the notion of a "test for truth," and he makes some very strong claims about what he calls "adequate" tests for truth. He rejects all tests for truth but his own as "inadequate" on the grounds of inability to establish one system and eliminate all competing systems that claim truth." He then proposes his own world view, which, he claims, contains an "adequate" test for truth, in the sense that it evaluates all world views. What Geisler is proposing as an adequate test for truth is a decision procedure which is "universal" in the sense that it must be applicable to all world views.

2. Of course, in Chapter 8. Geisler proposes a test for truth. However, a definition of "test for truth" is quite different from the specification of a particular test for truth which is claimed to better than other tests for truth. Furthermore, even his own proposal for test for truth is not clearly defined, except in other undefined terms.

3. By "effective way," we mean that there is a well-defined procedure, or process, by which the meaning and the truth-value of every such proposition is to be determined. Nothing is said about how "smart" or "clever" one might have to be in order actually to follow the process to determine truth-values of propositions.

4. Although we have presented the idea of a "universal semantics" in a neutral tone, we think this is an absolutely crucial notion. It seems to us that it is just this issue which places one with respect to Francis Schaeffer's "line of despair." (See Francis A. Schaeffer, The God Who Is There (Downers Grove, IL: Inter-Varsity Press, 1968).) If one believes that such a universal semantics exists, he is on the "old school" or "romantic" side above the line of despair; if he does not, he is below, or on the contemporary side of the line. Personally, we believe this universal semantics exists. If it does not, then sound arguments must have a very different set of rules from those judged sound if it does exist. It seems to us it is precisely the belief that this universal semantics does not exist that gives rise to the contemporary philosophies and their concomitant theologies, including existentialism, liberal "Christianity," and neo-orthodoxy. One final point: It would be an interesting study to consider the consequences of thought, assuming the existence of a universal semantics different from the one we are positing in that not all its truth-value functions are effective. But that's another paper.

5. Geisler, p.133. It appears that Geisler is also claiming to have a test which evaluates all tests for truth (it is on this

basis that he rejects all systems but his own). In fact, the proofs in Sections 6 and 7 show that such a test does not exist.

6. It has been claimed that Geisler's own test, whatever it actually is, does not satisfy his own criterion. Indeed, the results which follow show that his book does not give enough information to know whether any test, as he conceives it, can, since he does not say exactly what the nature of world views, as he conceives of them, is.

7. Note that the mapping from world views to propositions is a homomorphism, not an isomorphism, due to the fact that the members of a set are not ordered and that the world view {(p1 and p2)} also corresponds to proposition (p1 and p2). We are, in fact, dealing with equivalence classes of world views and propositions, where the equivalence relations are defined according to commutativity of conjunction of propositions. The paper is, in fact, dealing only with the following representatives of these equivalence classes: For world views, {p1, p2, ..., pn} is the representative of all world views equivalent to it under commutativity of conjunction, and for propositions, (p1 and p2 and ... and pn) is the representative of the equivalence class of all propositions equivalent to it under commutativity of conjunction. However, all members of each equivalence class have the same truth value, so our mapping between representatives of these equivalence classes gives an obvious isomorphism between the equivalence classes of world views and propositions, which preserves truth-value. This is an issue which only confuses the proof, so we have avoided mentioning it in the paper. The arguments in the paper are correct, since whatever is said regarding the truth-value of the representative of an equivalence class is true for all members of the equivalence class.

8. Kurt Godel, "Ueber formal unentscheidbare Satze der Principia Mathematica und verwandter Systeme I", in _Monatsh. Math., Phys._, Vol. 38, 1931, pp. 173-198. (An English translation was published in 1962 by Oliver and Boyd, Edinburgh-London.)

9. Alonzo Church, "A note on the Entschidingsproblem," _Journal of Symbolic Logic_, Vol. 5, 1936, pp. 56-68; correction, _ibid_., pp. 101-102.

10. An excellent discussion of these and other results may be found in Mendelson, Elliott, _Introduction to Mathematical Logic_ (Princeton: Van Nostrand, 1964).

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