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ON THE POSSIBILITY OF A SUBSTANTIVE THEORY OF TRUTH*

ABSTRACT. The paper offers a new analysis of the difficulties involved in the construction of a general and substantive correspondence theory of truth and delineates a solution to these difficulties in the form of a new methodology. The central argument is inspired by Kant, and the proposed methodology is explained and justified both in general philosophical terms and by reference to a particular variant of Tarski's theory. The paper begins with general considerations on truth and correspondence and concludes with a brief outlook on the "family" of theories of truth generated by the new methodology.

Philosophers today are largely disillusioned with the idea of a substantive theory of truth, and the reasons are not difficult to fathom. On the one hand, the modern critics of truth have set up new, exacting standards of informativeness for substantive theories of truth (see, e.g., Field 1972); on the other hand, the modern critics have demonstrated that our current paradigm of a theory of truth, namely, Tarski's theory, is incapable, in principle, of satisfying these standards. This incongruity, along with the persistent difficulties facing the correspondence view of truth, have led the critics to conclude that a substantive theory of truth is (either at present or in principle) unattainable.

In this paper I would like to reopen the question of a substantive theory of truth and offer a new solution. My solution consists of a new methodology for substantive theories of truth, i.e., a new conception of the task, scope and structure of such theories. The proposed methodology upholds the requirements that a substantive theory of truth be highly explanatory, satisfy stringent criteria of informativeness, provide non-trivial answers to "deep" philosophical questions, etc. But it questions one of the central (if implicit) principles of the current methodology, namely: that *the task of a substantive theory of truth is to delineate the one (or at least one) substantive common denominator of all truths*. The feasibility of a substantive theory of truth, according to this principle, is contingent upon the existence of a substantive common denominator, but the existence of a substantive common denominator of all truths is (for reasons I will discuss below) highly problematic. My methodology for substantive theories of truth challenges this requirement. The theory of truth, on my conception, is



a “family” of theories rather than a single theory. Each theory in the family investigates *some* substantive (and relatively general) principle, “factor” or aspect of truth, and together these theories provide (in the ideal limit) a comprehensive substantive account of truth. Whether the family of theories of truth can be reduced to a single, common-denominator (or necessary and sufficient condition) theory, is an open question on this conception; but the feasibility of substantive theorizing on truth is not dependent on a positive answer to this question.

To demonstrate the viability of the proposed methodology, I offer an outline of a special theory based on it. This theory, which borrows many of its basic features from Tarski, investigates a specific, if widely applicable, aspect of truth, namely the *logical aspect*, and its account of this aspect satisfies the standards of substantiveness alluded to above. Any new theory proposed today must confront at least some of the major problems discussed in the literature. Accordingly, the theory I will delineate will be shown to avoid three main problems: (i) the trivial reduction problem (Field 1972), (ii) the relativity to language problem (Blackburn 1984 and others), and (iii) the indeterminacy of reference problem (Putnam 1977; and 1983).

1. TRUTH AND CORRESPONDENCE

1.1. *Truth as Correspondence*

My starting point is the intuition that truth has to do with the way things are in the world. The primary target of truth are objects, and to find the truth about objects is to find out their properties, their relations, their identity, and so on. Thus, to find the truth about “the murder of the century” is to find out who killed Ms. Brown and Mr. Goldman, how, and why; to find the truth about the origins of the universe is to find out whether it was created by an instantaneous explosion of elementary particles, or by a sequence of six providential decrees, or . . . ; to find the truth about the size of the continuum is to find out, among other things, whether $2^{\aleph_0} = \aleph_1$, and so forth. And to arrive at the truth about these things is to acquire knowledge about them. So goes the initial intuition. But the quest for truth is carried out in language: hypotheses are formulated in language, questions are asked and answered in language, and presumed knowledge (belief) is expressed in declarative sentences in language. Since language is a central vehicle for the discovery of truths, one central branch of the theory of truth – the so-called *semantic* branch – investigates truth as a property of linguistic entities. The basic principle underlying the semantic notion of truth can be

expressed by a paraphrase of Aristotle: To say (by means of a declarative sentence) of what is so that it is so or of what is not so that it is not so, is true, while to say (by means of a declarative sentence) of what is so that it is not so or of what is not so that it is so, is false. (Metaphysics, 1011^b25)¹ Abstracting from acts of saying (circumstances of utterance), we obtain truth as a property of declarative sentences: A sentence that says of what is so that it is so is true, etc. Looked at in this way, the semantic notion of truth is inherently a correspondence notion.

The view that correspondence is built into semantic notions was stated time and again by Tarski: “A characteristic feature of the *semantic concepts* is that they give expression to *certain relations* between the *expressions of language* and the *objects* about which these expressions speak” (1933, 252, my emphasis; see also Tarski 1936a, 401, 403; and 1944, 345). Some semantic concepts, e.g., ‘reference’ and ‘satisfaction’ express these relations directly; others, in particular ‘truth’ (but also ‘logical consequence’), express them indirectly. The underlying idea is that a sentence satisfies the truth predicate just in case certain conditions having to do both with what the sentence says (language) and with how things are (the world) are fulfilled.²

1.2. A Scheme of Correspondence

The semantic conception of truth receives a partial expression in Tarski’s *Convention T*. Restricting his attention to open languages of the deductive sciences (open in the sense of not containing semantic predicates applicable to their own expressions), Tarski requires that an adequate definition of truth for a language L imply, for each sentence σ of L , a biconditional defining the intuitive, i.e., correspondence, notion of truth as it applies to it. Tarski’s informal example of such a biconditional is (T_s): *The sentence ‘snow is white’ is true iff (if and only if) snow is white*. Given a language L with a meta-language, ML , the general form of the truth biconditionals can be described by the schema (T): *True $\langle \sigma \rangle$ iff $\bar{\sigma}$* , where (i) ‘ $\langle \sigma \rangle$ ’ stands for an ML expression designating a sentence σ of L , and (ii) ‘ $\bar{\sigma}$ ’ stands for an ML sentence stating the objectual truth conditions of σ . (Tarski’s own formulation of the second condition is: ‘ $\bar{\sigma}$ ’ stands for an ML translation of $\bar{\sigma}$ ’, but the sense in which the T -Schema expresses the correspondence conception of truth is, in my view, more clearly spelled out in (ii).)

The central feature of the T -Schema, from the point of view of correspondence, is the contrast between the left and right sides of its instances (the definienda and the definiens). The left side of a T -biconditional consists of a *linguistic predication*, its right side of an *objectual* or “worldly” *predication*. The task of a correspondence theory of truth is to reduce *truth*

predications, which are linguistic, to *objectual* predications specifying the conditions which have to hold in the world in order for a given sentence to be true. For example, reduce ‘TRUE(‘Snow is white’)', which predicates truth (a semantic property) of a linguistic entity, to ‘WHITE(snow)', which predicates whiteness (a “worldly” property) of an object (stuff) in the world.³

1.3. Correspondence and Disquotation

The *T*-Schema is sometimes viewed as a *disquotation* schema, and under this view the schema is said to be *purely linguistic* as well as *trivial*. What the *T*-Schema represents, on this view, is a correlation between names of sentences and sentences (or their literal translations into the meta-language), and all a theory guided by the schema is required to entail is a series of trivial biconditionals: ‘‘snow is white’ is true iff snow is white’, ‘‘the cat is on the mat’ is true iff the cat is on the mat’, ‘‘all mimsy were the borogroves’ is true iff all mimsy were the borogroves’ (Wiggins 1972)⁴, etc. A theory guided by the *T*-Schema is, on this view, neither a correspondence theory nor a substantive theory.

Following Tarski (1933), I would like point out, first, that the disquotational reading of the *T*-biconditionals does not conflict with their correspondence reading. We switch from one to the other by a change in gestalt, so to speak. Read in the correspondence mode, (T_s) says that a sentence, ‘snow is white’, is true iff the object snow has the property of being white; read in the disquotation mode, (T_s) says that a sentence in which ‘snow is white’ is mentioned is equivalent to a sentence in which ‘snow is white’ is used. Viewed one way, the *T*-biconditionals reduce statements about linguistic entities to statements about “worldly” objects; viewed another way, the *T*-biconditionals reduce statements in which linguistic expressions appear within the scope of a name-forming operator to statements in which these linguistic expressions (or their *ML*-correlates) appear outside the scope of such an operator. Using the medieval distinction between *suppositio materialis* and *suppositio formalis*, we can say that the first reading assumes the *suppositio formalis* mode, the second – the *suppositio materialis* mode.⁵ The two readings are connected by the convention that expressions within the scope of a name-forming operator denote linguistic entities, while expressions not in the scope of such an operator denote objects in the world.⁶

Second, not all instances of the *T*-Schema, as it is construed here, are disquotational. For example, (T_{s*}) ‘Snow is white’ is true iff snow reflects light of all hues completely and diffusely is a perfectly legitimate non-disquotational instance of (*T*). To require that the *T*-biconditionals be

disquotational is to replace (ii) by (ii*): ‘ $\bar{\sigma}$ ’ stands for an *ML* sentence which is either σ or a literal translation of σ . But (ii*) is obtained from (ii) by a proviso that is obviously gratuitous from the correspondence point of view: $\bar{\sigma}$ states the objectual truth conditions of σ in a special way: namely, by repeating, or being a literal translation of, σ . The disquotationalist will point out that (T) is nevertheless *compatible* with a disquotational reading. This point granted, we have to add an additional proviso for *substantive* correspondence theories of truth, namely: $\bar{\sigma}$ states the objectual truth conditions of σ in an *informative manner*.

1.4. *The Redundancy Problem as a Triviality Problem*

The triviality of the traditional *T*-biconditionals is, in my view, at the root of the so-called *redundancy problem*. The *T*-Schema, according to the redundancy theorist, renders the truth predicate redundant: given an object-language sentence σ , we do not assert by *True* (σ) anything different from what we assert by σ . Among the conclusions drawn: the correspondence theory of truth is theoretically empty, truth is not a genuine property (‘true’ is not a real predicate), etc. (See Ramsey 1927; Ayer 1946; Horwich 1990 and others.) Our discussion of the disquotational approach to truth leads to a new analysis of the redundancy problem. The *T*-Schema, according to the redundancy theorist, renders the truth predicate redundant. Why? Not because a statement in which ‘is true’ occurs is equated with a statement in which ‘is true’ does not occur (after all, it is the task of a definition to eliminate the defined concept!), but because a statement in which ‘is true’ is *predicated on* σ is equated with a statement which is *essentially the same* as σ . We have seen, however, that it is possible to formulate the *T*-Schema in a way that does not entail the triviality of the *T*-biconditionals. One has to distinguish between the idea of *grounding* truth in *objectual predication*, which is far from trivial, and the trivialization of this idea by disquotational *T*-biconditional. The *redundancy problem* is a *trivialization* problem. Any idea (or almost any idea) can be trivialized by a gratuitous implementation; the question is whether a non-trivializing, systematically informative implementation of the correspondence idea is possible.

1.5. *A Substantive (Informative) Definition*

The notion of substantiveness raises many issues that I will not be able to discuss here, but roughly, in thinking of a *substantive* definition of truth I have in mind Field’s (1972) paradigm. Comparing informative and uninformative definitions of *valence*, Field points out that the definition ‘chemical element c has valence n iff [($c = \text{potassium} \ \& \ n = +1$) $\vee \dots \vee$ ($c = \text{sulphur} \ \& \ n = -2$)]’ is trivial (unsubstantive), while a definition of the

form ‘chemical element c has valence n iff c has physical structure F_n ’, where F_n is a physical structure represented by n , is informative. Similarly, a theory which says that $\langle \sigma \rangle$ is true iff [$\langle \sigma \rangle = \text{‘Snow is white’} \ \& \ \text{Snow is white} \rangle \vee \langle \sigma \rangle = \text{‘The cat is on the mat’} \ \& \ \text{The cat is on the mat} \rangle \vee \dots]$ is unsubstantive, but a theory which offers a systematic account of the truth conditions of sentences of L based on some explanatory principle is substantive.⁷

In the next section I will examine an argument due to Kant which claims the impossibility, in principle, of such a substantive account. This argument points to certain basic methodological difficulties facing the theory of truth, and it will serve as a catalyst for the proposed methodology.

2. A BASIC METHODOLOGICAL PROBLEM

2.1. *Kant’s Argument*

In an important, yet largely neglected passage of the *Critique of Pure Reason* (A58–9/B82–3) Kant argues against the possibility of a correspondence theory of truth that is both substantive and general. Taking the “nominal” Aristotelian definition of truth – “[truth] is agreement of cognition⁸ with its object” – as his starting point, Kant asks whether it is possible to go beyond this definition and formulate a “general and sure criterion of the truth of any and every cognition”. Although Kant’s question is formulated in a context and terms different from ours – the “old” metaphysics (“dialectic logic”) instead of contemporary philosophy, “criterion” instead of “informative specification of truth conditions”, “cognition” instead of “sentence”, etc. – his actual argument is not dependent on the historical context, and it can naturally and profitably be applied to the question of truth as it is asked here.⁹ And Kant’s answer to this question is negative. Kant reasons as follows:

If truth consists in the agreement of cognition with its object, that object must thereby be distinguished from other objects; for cognition is false, if it does not agree with the object to which it is related, even although it contains something which may be valid of other objects. Now a general criterion of truth must be such as would be valid in each and every instance of cognition, however their objects may vary. It is obvious however that such a criterion [being general] cannot take account of the [varying] content of cognition (relation to its [specific] object). But since truth concerns just this very content, it is quite impossible, and indeed absurd, to ask for a general test of the truth of such content. A sufficient and at the same time general criterion of truth cannot possibly be given. . . . Such a criterion would by its very nature be self contradictory. [Bracketed clarifications inserted by translator.]

In *Logic* (56), Kant rephrases and somewhat clarifies his argument: Contrasting the “objective, material” notion of truth, having to do with

the “matter” or “object[s]” of cognition, and the “subjective, formal” notion, which has to do with the “form” of cognition as such, in abstraction from all objects, Kant argues for the impossibility of a theory of truth that captures the objective notion:

A universal, material criterion of truth is not possible – indeed it is even self-contradictory. For as *universal* and valid for all objects as such, it would have to abstract from all differences of objects, and yet at the same time, as a material criterion, have to pertain to these differences in order to be able to determine whether a cognition agrees with the very object to which it is referred, and not merely with some object in general, whereby actually nothing would be said at all. But material truth must consist in the agreement of a cognition with that definite object to which it refers. For a cognition that is true in respect of one object may be false in reference to another. It is therefore absurd to demand a universal, material criterion of truth, which should at once abstract and again not abstract from all differences of objects.

Truth, according to Kant, is what we might call a “highly singular” property, i.e., a property P such that for every a and b in its domain, if $a \neq b$, then the conditions under which a possesses P are essentially different from the conditions under which b possesses P . If, then, our goal is a *general and substantive theory of truth*, i.e., a theory whose task is to specify the substantive characteristics possessed by all and only truths – the substantive *common denominator* of all truths or a substantive *necessary and sufficient condition* for any sentence or cognition to be true – then, according to Kant, our goal is unrealizable. Highly singular properties are “anti-common denominator” properties, and the job description of a general and substantive theory of truth is, therefore, contradictory.

Kant’s claim can be construed very radically as saying that no two truths have anything substantive in common. But the intuitive force of Kant’s argument is better seen in a more moderate version. In plain words and using contemporary terminology, we can explain the prima-facie valid core of Kant’s argument as follows: Consider two truths of the same syntactic structure but altogether different subject matters, say, ‘ $2 < 10$ ’, and ‘John loves Mary’ (assuming it to be true). In spite of their syntactic similarity, the substantive truth conditions of these two sentences appear to have nothing in common. The truth of ‘ $2 < 10$ ’ is a matter of such things as the positions of 2 and 10 in the natural number series, the non-existence of surjective (“onto”) mappings from sets with 2 elements to sets with 10 elements, and so forth; the truth of ‘John loves Mary’, in contrast, is a matter of John’s feelings towards Mary, John’s behavior regarding Mary, John’s brain states involving a representation of Mary, and so on. The truth conditions of these two sentences are altogether different, and an informative theory of truth must account for these differences. But a general theory of truth must abstract from these differences. Ergo: a con-

tradition. A *substantive theory of truth is not general; a general theory of truth is not substantive*. To invoke a general principle which says that a sentence of the form $\lceil Rab \rceil$ is true iff the referent of ‘*a*’ stands to the referent of ‘*b*’ in the relation referred to by ‘*R*’, is to gloss over pertinent differences. To assign each sentence its own unique truth condition is to preclude a general explanation. A general criterion of truth does not *explain* what makes sentences true, and an explanatory criterion of truth is not *general*. Wittgenstein (1958, #11–12) uses the metaphor of identically shaped handles of a locomotive to warn us against attributing unwarranted significance to the “uniform appearance of words”: All handles in a locomotive look alike, but they each perform a different function. Likewise (in our case), different sentences “look”, i.e., are syntactically, alike, but they each *perform* a different predication. Just because all handles look alike, it does not follow that they all operate on the same principle, and just because all sentences of the form $\lceil Rab \rceil$ are syntactically alike, it does not follow that they all have the same truth conditions. The truth of a sentence is tied up with its specific function or content (with what properties/relations it attributes to what objects); but the contents of sentences – hence their truth conditions – are too diverse to be systematized by a single principle.

The need to give an informative account of the differences between truths means, in effect, that a general and substantive theory of truth has to specify the *identity conditions* of truths. The requirement that an adequate theory of *X* specify the identity conditions of objects falling under *X* is familiar from other contexts. One of those contexts is Frege’s (1884) definition of *number*. An adequate definition of number, Frege would say, does not just distinguish between numbers and non-numbers but also distinguishes between one number and another.¹⁰ Thus, imagine a definition of number that tells us that 2 and 10 are numbers and that Mount Everest is not a number, but does not tell us that 2 and 10 are different numbers. Would such a definition be adequate? Would a definition of number that does not explain in a general and systematic manner in what way two numbers differ from each other be acceptable? The notion of number is tied up with the structure of numbers, and likewise, the notion of truth, according to Kant, is tied up with the *content* of true sentences. But how can the diversity of contents be accounted for by a single principle? How can we define truth in a way that captures both what is common to all truths and what distinguishes between them? This is the problem of truth, according to Kant, and the problem of truth, Kant says, is insoluble.¹¹

Blackburn (1984, 230–1) presents an argument very similar to Kant’s for the claim that truth is not a genuine property (that truth is not a proper subject of substantive philosophical inquiry):

[C]ompare 'is true' ... with a genuine target of philosophical analysis: 'is conscious', or 'has rights', for example. We investigate these by looking for the principles which determine whether something is conscious, or has rights. These principles are intended to govern any such judgements, so that we get a unified class: the class of conscious things, or things that have rights. Each item in such a class is there because it satisfies the same condition, which the analysis has uncovered. Or, if this is slightly idealized, we find only a "family" of related conditions or "criteria" for application of the terms. Still there is then a family relationship between the members of the class. But now contrast 'is true'. We know *individually* what makes this predicate applicable to the judgements or sentences of an understood language. ... But these reasons are entirely different [in the case of different judgements or sentences]. There is no single account, or even little family of accounts, in virtue of which each deserves the predicate ... There are *as* many different things to do, to decide whether the predicate applies, as there are judgements to make. So how *can* there be a unified, common account of the "property" which these quite different decision procedures supposedly determine? ... The idea that there is [a common property of truth] is an illusion.¹²

Is Kant's (and "Blackburn's") argument valid?

2.2. A Basic Methodological Conflict

Kant's argument, as I understand it, points to a very basic methodological conflict, the source of deep tensions in all knowledge. There is a fundamental tension in all knowledge between two basic principles of theorizing and conceptualization: the principle of *generality* or *universality* and the principle of *specificity* or *differentiation*. The principle of generality is succinctly stated by Russell in reference to mathematics: "It is a principle, in all formal reasoning, to generalize to the utmost" (1919, 196). Yet generality is empty without specificity: "The world", as Austin puts it, "must exhibit (we must observe) [both] similarities and dissimilarities ... : if everything were either absolutely indistinguishable from anything else or completely unlike anything else, there would be nothing to say." (1961, 89). Kant himself makes a similar point: "it is only on the assumption of differences in nature, just as it is also under the condition that objects exhibit homogeneity, that we can have any faculty of understanding whatsoever" (1781/7, A657/B682); "reason ... exhibits a twofold self-conflicting interest ..., on the one hand interest in ... universality ..., and on the other hand in ... determinateness ... in respect of the multiplicity" (A654/B682). Theorizing and concept formation require both generalization and differentiation, yet the two stand in a fundamental tension.

The tension between generality and specificity is especially severe in the case truth due to the confluence of two circumstances: on the one hand we philosophers have set up extraordinarily high standards of generality for our truth theories, to the point of assuming that if a substantive account of truth could be given at all, it could be given by a single, and simple,

definition or schema.¹³ On the other hand, the concept of truth itself is extraordinarily broad, complex and diversified, interwoven in different ways in different areas of our cognitive life, and applicable to sentences of different kinds (physical, psychological, mathematical, ethical, . . . , concrete, abstract, . . .) in different ways and for different reasons. As such it resists any attempt at a simple, sweeping characterization. The problem of truth is the problem of two forces exerting their pull in opposite directions: the enormous breadth of truth calls for a highly general theory; but the enormous diversity of truths (truth conditions) calls for a multiplicity of narrow and highly specialized theories. Whether, and how, the two forces can be balanced depends (i) on the degree of singularity of truth (if truth turns out to be singular in the extreme, each truth will require its own theory), and (ii) on our willingness to replace our rigid standards of generality for theories of truth by more flexible and “realistic” standards.

Before proceeding to examine the possibility of such a balance, I would like to clarify my point by considering an objection: ‘Your reasoning’, the objection goes, ‘can be applied to the definition of any concept whatsoever. Take, for example, the concept of *accurate portrait*. One could argue that because different people look different, an adequate definition of ‘accurate portrait’ is impossible. But surely such a definition is possible. Here is one: ‘A portrait is accurate iff it looks like the person it is a portrait of.’

First, I would like to make clear that by ‘a substantive account of accurate portraiture’ I understand something very different from the definition proposed above. A substantive account of accurate portraiture provides the kind of information that a student of portraiture has to assimilate in order to produce accurate portraits, i.e., information about what features of the portrayed object have to be preserved by an accurate portrait (color, shape, proportion do, size and texture do not), information about the faithful representation of facial expressions, information concerning the representation of physical surroundings, if any (e.g., the relations between distance, size and proportion), etc.

Second, in spite of the fact that a substantive account of accurate portraiture is far from simple, the task of constructing such an account does not raise the same problems that a substantive account of truth does. This is because essentially the same principles are involved in the accurate portrayal of all persons. To see under what conditions problems similar to those of truth arise, consider the possibility of extending the notion (and practice) of accurate portraiture to objects in general, including objects different from the “mid-sized” physical objects we usually associate with accurate picturing: e.g., heavenly bodies, subatomic particles, sets, numbers, emotions, social institutions. Clearly, the principles underlying the

pictorial representation of subatomic particles are very different from those underlying the pictorial representation of human faces. It is at this level of generality – the level of conceiving of a *universal* system of pictorial representation – that problems analogous to those of truth arise.¹⁴

2.3. A Matrix of Strategies

To examine the possibility of a general and substantive theory of truth in a more systematic manner I will construct a matrix of *strategies* for developing such a theory. Each node in the matrix will consist of a *generality* standard and a *singularity* principle, and together these nodes will delineate a “space” of strategies for the construction of substantive truth theories. Although the matrix I will construct is rather artificial and simplistic (and it does not exhaust the space of all possible strategies), it will further illuminate the problem we are facing and set the ground for the proposed solution.

To delineate the array of strategies I will need a modest conceptual apparatus. Thinking of a theory of truth as a theory of truth conditions, I will introduce the primitive notion of a *substantive determinant* of truths. I will not give a precise definition of this notion here (in a sense, our goal is to work out the content of this notion), but for the purpose of the present discussion it suffices to think of the substantive determinants of, say, the truth ‘John loves Mary’ as what “makes it true” that the referent of ‘John’ stands in the relation referred to by ‘loves’ to the referent of ‘Mary’: i.e., John’s feelings (behavior, brain states, etc.) concerning Mary.¹⁵ Using this notion we will formulate the following identity (individuation) principle for truths:

$$(ID) \quad (\forall t_1)(\forall t_2)[\text{Truth}(t_1) \ \& \ \text{Truth}(t_2) \ \rightarrow \\ (t_1 = t_2 \ \text{iff} \ \forall d(d \ \text{is a substantive determinant of } t_1 \leftrightarrow \\ d \ \text{is a substantive determinant of } t_2)].$$

This principle says that two truths are identical iff they have exactly the same determinants. By distinguishing three *generality standards* and three *singularity theses* we arrive at an array of 9 strategies. The three singularity principles are:

- (S1) No distinct truths share any substantive determinants.
- (S2) Some distinct truths share no substantive determinants.
- (S3) No distinct truths share all their substantive determinants.¹⁶

The three generality standards are:

- (G1) *The task of a theory of truth is to identify the substantive determinant of all truths.*¹⁷
- (G2) *The task of a theory of truth is to identify some substantive determinant(s) of all truths.*
- (G3) *The task of a theory of truth is to identify some substantive determinant(s) of some truth(s).*

Any pair of a generality standard and a singularity thesis, $\langle G_i, S_j \rangle$, constitutes a *strategy* for truth theories. Our question is: Which, if any, of the nine strategies is a viable strategy? In order to answer this question let us first note the existential assumptions (requirements) embedded in the three generality principles:

- E(G1) There is exactly one substantive determinant of truth.*¹⁸
- E(G2) There is at least one substantive determinant of all truths.*
- E(G3) There is at least one substantive determinant of some truth (s).*¹⁹

It is easy to see that neither $\langle G1, S2 \rangle$ nor $\langle G2, S2 \rangle$ is logically realizable: the existential assumptions of *G1* and *G2* are logically incompatible with *S2*. Moreover, assuming – as surely we do – that the number of truths is larger than one, $\langle G1, S1 \rangle$, $\langle G1, S3 \rangle$ and $\langle G2, S1 \rangle$ also involve a logical contradiction. We are left with $\langle G2, S3 \rangle$ and the three *G3* strategies. Clearly *G3* is too weak a generality standard for a substantive theory of truth: *G3* permits a situation in which each truth has its own theory, utterly trivializing the idea of a *general* theory of truth. We can sum up the results of our investigation so far by the following table:

Table of Strategies

	<u>S1</u>	<u>S2</u>	<u>S3</u>
<u>G1</u>	Logically unrealizable*	Logically unrealizable	Logically unrealizable*
<u>G2</u>	Logically unrealizable*	Logically unrealizable	?
<u>G3</u>	Methodologically unacceptable*	Methodologically unacceptable	Methodologically unacceptable*

* Assuming a multiplicity of truths.

We have ruled out all strategies in the table but one. Is $\langle G2, S3 \rangle$ a viable strategy? Let us consider *S3* first. *S3* is equivalent to our identity

principle of truth, *ID*, and as such it is the weakest possible singularity principle within our framework. Our considerations above suggest that *S3* is too weak to capture the singularity of truth in all its magnitude. *G2*, on the other hand, is a strong generality standard. *G2* involves a strong and far from obvious existential assumption, namely, that *there exists at least one substantive determinant common to all truths* ($E(G2)$). This assumption has, to the best of my knowledge, never been established, and it is easy to bring (prima facie) counter-examples to it. Thus, consider ‘John loves Mary’, ‘It is raining or it is not raining’ and ‘generosity is a virtue’. The first is a psychological truth, the second a logical truth, the third an ethical truth; the first is empirical, the second and third abstract. – What *substantive* determinant is common to all these truths?

2.4. *The Myth of the Common Denominator*

Some such principle as *G2*, however, or even *G1*, has long dominated the philosophical literature on truth. The idea that the task of a theory of truth is to investigate the common denominator of all truths, or the necessary (necessary and sufficient) condition(s) for truth, is implicit, if not explicit, in much of the literature. But this idea, as we have just observed, involves an unfounded assumption: that there exists some one thing which, either alone, or in conjunction with other things, is a substantive determinant (factor, constituent, explanans) of the truth of each and every true statement. The “myth of the common denominator” is, in my view, largely responsible for our disillusionment with a substantive theory of truth. If the theory of truth has the task of identifying the/a common denominator of all truths, yet there is no *substantive* common denominator of all truths, then the theory of truth is at best a theory of the/a non-substantive common denominator of all truths, i.e., the theory of truth is non-substantive. (This, in a sense, is the root of deflationism.²⁰)

While the weaker common-denominator assumption, $E(G2)$, is highly problematic, the stronger common-denominator assumption, $E(G1)$, is outright absurd. It follows from this assumption (assuming *ID*) that all truths are identical, i.e., that there is at most one truth! I conclude that in the absence of a decisive argument in support of either $E(G1)$ or $E(G2)$, neither *G1* nor *G2* can be used as a basis for substantive theorizing on truth. Our last strategy, $\langle G2, S3 \rangle$, is thus ruled out. We have ruled out all nine strategies in our matrix. Is a general and substantive theory of truth unrealizable?

2.5. *A Viable Strategy*

Let us reflect once again on our generality standards, *G1*, *G2*, and *G3*. For the sake of simplicity we have selected three representative standards,

but the “space” of generality standards is obviously not restricted to these three. Thus, if two of the standards are too strong while the third is too weak, some intermediate standard may yet fill the bill. We are led to search for a generality standard stronger than $G3$ and weaker than $G2$, i.e., a generality standard which precludes a situation in which each truth has its own theory, yet is not committed to the existence of a universal determinant of truths. In other words, we are looking for a standard that requires a theory of truth to be intuitively general, without requiring it to be either total (account for *all determinants* of a given truth) or universal (account for *all truths*). What singularity principle should such a standard be compatible with? – Clearly $S3$ and, in view of the prima facie evidence for $S2$ (and the absence of counter-evidence to it), also $S2$. What about $S1$? – $S1$ is obviously too strong a singularity standard for truth. $S1$ in effect restricts each truth to a single determinant (or set of determinants, pairwise disjoint from the set of determinants of any other truth), thereby ruling out any substantive commonalities between truths. Such a strong singularity claim is clearly countered by the data. Take, for example, two truths predicating the same relation of different objects (e.g., ‘ $2 < 3$ ’ and ‘ $4 < 5$ ’), or two truths predicating different relations of the same objects (e.g., ‘ $2 < 4$ ’ and ‘ $2 = \sqrt{4}$ ’). Clearly, the truths in each pair share at least one substantive determinant. I conclude that an adequate generality standard for truth would be compatible with $S3$ and $S2$ but not with $S1$.

Consider the following generality standard which, being intermediate between $G2$ and $G3$, I will call ‘ $G2\frac{1}{2}$ ’. Unlike $G1$ – $G3$, $G2\frac{1}{2}$ involves a non-quantitative notion, namely that of a ‘significant’ collection of truths. This notion, though methodologically important, is not easy to define, and I will use it here in its intuitive, everyday sense. (A paradigmatic example of a collection falling under this notion will be presented in the next section.) The existence of an undefined element in $G2\frac{1}{2}$ means that $G2\frac{1}{2}$ cannot be used as an automatic test of generality for putative theories of truth. Rather, this standard provides a general methodological guideline which in different applications may involve different considerations. In its simplest form $G2\frac{1}{2}$ says:

($G2\frac{1}{2}$) *The task of a theory of truth is to identify some substantive determinant of all truths in a relatively large and significant collection.*

It is reasonable, however, that a general theory of truth will seek to explain not a single determinant of all truths in some relatively large and significant

collection, but rather a group of interrelated determinants which together apply to all truths in such a collection. Accordingly we reformulate:

($G2\frac{1}{2}$) *The task of a theory of truth is to identify some family of inter-related substantive determinants of truths in a relatively large and significant collection.*

More informatively, and using ‘factor of truth’ to refer to a family of determinants as above, we formulate:

($G2\frac{1}{2}$) *The task of a theory of truth is to identify a single principle, or a unified array of principles, which (together) account for some relatively general and intuitively substantive factor or factors of truth.²¹*

It is readily seen that $G2\frac{1}{2}$ (in either formulation) avoids the pitfalls of both $G2$ and $G3$. Furthermore, $G2\frac{1}{2}$ is compatible with $S2$, hence with $S3$, as desired. I therefore conclude that there exists a viable strategy for substantive theories of truth, namely, $(G2\frac{1}{2}, S2)$. A theory of truth, according to this strategy, provides an informative account of some factor of truth, a factor at once substantive and at work in a large number of cases. This strategy neither requires nor rules out the existence of a substantive denominator common to all truths. The project of a substantive theory of truth, according to this strategy, is not an either/or project: either we construct an absolutely general substantive theory of truth or we abandon the project of truth altogether. Rather, this strategy allows us to negotiate the generality and informativeness of our theories of truth to the best of our ability, given the conceptual resources available to us on the one hand and the complexities of our subject matter on the other. The result is a *family* of theories of truth, each investigating some aspect, some feature, some factor of truth, and together providing a comprehensive account of the correspondence notion of truth.²²

Strategies similar to $(G2\frac{1}{2}, S2)$ are familiar from science. Take a scientific concept comparable to truth in its breadth, depth, complexity and level of singularity: say, *life* or *nature* (“the natural world”). There is no *one* theory of nature (*the one and only* theory of nature). There is a large diversity of theories of nature, each investigating some aspect(s), some force(s), some significant factor(s) in the working of nature. This observation does not invalidate the ideal of *unification* in science. Ever since Thales reduced all multiplicity in nature to one element, the search for a universal principle of nature – a common denominator of all natural phenomena, or better yet, *the* common denominator – has been one of the main driving forces

of science. But it is important to note, first, that scientists are not trying to find an ultimate principle of nature “at all costs”, in particular, not at the cost of *trivializing* science. Second, the viability of natural science is not dependent on the discovery of such a principle. (A “grand” unification principle is a *desideratum*, not a *precondition*, of science.) Finally, the idea of unification is not restricted to an ultimate principle: partial unificatory principles play a central role in science, and it is here, in the pursuit of greater and greater, yet still substantive, generalities, that the $\langle G2\frac{1}{2}, S2 \rangle$ strategy demonstrates its efficacy.²³

In the next section I will present an outline of a substantive theory of truth based on this strategy. This theory is a variant of Tarski’s theory, though its emphasis is different from that associated with Tarski’s theory by most commentators. This theory does not purport to be a “total” theory of truth, and there are many facets of truth that this theory does not touch upon, but it does provide a comprehensive account of some central factor of truth and it does so in accordance with our current standards of precision and informativeness (e.g., Field’s informal standard discussed in Section I above).

3. A SUBSTANTIVE THEORY OF TRUTH

Consider a theory, *T1*, whose main component is a *method of defining truth* for a certain range of languages. By a method of defining truth I mean a partly schematic definition of truth, applicable to all languages in a given range. Certain parts of the definition change from one application to another, others remain the same. The “fixed” parts plus the schematic form of the changing parts constitute the “method”. *T1* is similar in certain ways to our current paradigm of a theory of truth, namely, Tarski’s theory, but the exact relation between *T1* and Tarski’s theory is immaterial for our discussion. Our investigation of *T1* centers on the following questions: (1) Is *T1* a substantive theory? (2) Is *T1* a general theory? (3) Is *T1* a correspondence theory? To answer these questions I will propose two interpretations of *T1*: a “generalist” interpretation, according to which *T1* provides, or seeks to provide, a general account of truth for the given range of languages, and a “specialist” interpretation, according to which *T1* provides, or seeks to provide, an account of a special aspect of truth (central to these languages). I will show that with respect to the *generalist* interpretation of *T1*, the answer to the first question is negative, while with respect to the *specialist* interpretation of *T1* or, rather, a certain specialist extension of *T1*, *T2*, the answers to all three questions are positive. I will conclude by showing that

the “specialist” version of *T1*, and in particular *T2*, are immune to common criticisms of theories of truth associated with Tarski.

3.1. *T1*

T1 delineates a method of defining truth, applicable to any open fragment of natural, scientific and mathematical language, formalized within a specified syntactic framework.²⁴ In order to handle the infinite extension of the truth predicate in these languages, the method chosen is *recursive*. The recursive method allows us to define infinite predicates in a finite number of steps by keying itself to certain structural features of the objects in a given domain. The underlying idea is that if a given domain of objects, *S*, is constructed inductively, i.e., all objects in the domain are generated from a finitely specified “base” by means of finitely specifiable operations, and if, furthermore, *S* is freely generated by this construction (i.e., each object is generated in a unique way),²⁵ then we can define predicates over *S* by recursion, based on the inductive structure of objects in *S*: for objects in the base we specify their satisfaction conditions directly; for objects generated by inductive operators we specify their satisfaction conditions by recursive rules (a rule for each inductive operator or collection of relevantly similar inductive operators). Provided the conditions for objects in the base are finitely specifiable, the recursive definition of a given predicate over *S* is essentially finite.

There is, however, more to the structure of a theory of truth than taming the infinite. In particular, the distinction between what I will call ‘distinguished’ and ‘non-distinguished’ elements plays an important role in determining what information is, and what information is not, conveyed by such a theory. Before turning to this issue, however, let me draw an outline of *T1*. (I assume the reader’s familiarity with basic syntactic and semantic notions.)

SYNTAX. The syntax of *T1* delineates the range of languages to which the semantic method of *T1* is applicable. To simplify the presentation, I restrict myself to a range of relatively simple languages, but the restrictions on the order of variables and the arity of predicates and function symbols should be regarded as inessential.²⁶

A language, *L*, in the range of languages of *T1* is characterized as follows:

Basic vocabulary

I.

1. ' \approx ' – identity,
2. ' \neg ' – negation, '&' – conjunction, ' \vee ' – disjunction (or another complete collection of truth-functional connectives),
3. ' \exists ' – the existential quantifier (and/or ' \forall ' – the universal quantifier)

II.

4. ' x_0 ', ' x_1 ', ' x_2 ', ... – individual variables,
5. ' c_0 ', ..., ' c_k ', $k \geq 0$ – individual constants
6. ' f_0 ', ..., ' f_l ', $l \geq 0$ – 1-place functions,
7. ' P_0 ', ..., ' P_m ', $m \geq 0$ – 1-place predicates,
8. ' R_0 ', ..., ' R_n ', $n \geq 0$ – 2-place predicates.²⁷

The main syntactic structures of L are *term*, *formula* and *sentence*. These are defined (the first two inductively, the third directly) by:

(A1) *Term*

1. ' x_i ', $i \geq 0$, is a term.
2. ' c_i ', $0 \leq i \leq k$, is a term.
3. If t is a term, then ' $f_i(t)$ ', $0 \leq i \leq l$, is a term.
4. Only expressions obtained by 1–3 above are terms.

(B1) *Formula*

1. If t is a term, ' $P_i(t)$ ', $0 \leq i \leq m$, is a formula.
2. If t, t' are terms, ' $R_i(t, t')$ ', $0 \leq i \leq n$, is a formula.
3. If t, t' are terms, then ' $t \approx t'$ ' is a formula.
4. If Φ is a formula, then ' $\neg\Phi$ ' is a formula.
5. If Φ, Ψ are formulae, then ' $\Phi \& \Psi$ ' is a formula.
6. If Φ, Ψ are formulae, then ' $\Phi \vee \Psi$ ' is a formula.
7. If Φ is a formula, then ' $\exists x_i \Phi$ ', $i \geq 0$, is a formula.
8. Only expressions obtained by 1–7 above are formulae.

(C1) *Sentence*

A formula with no free occurrences of variables is a sentence.

SEMANTICS. The semantics of $T1$ provides a *method for defining truth*, applicable to all languages in the range delineated in the syntax. The method is presented in the form of a *definition-schema*. Given a particular

language, L , in the designated range, the schema generates (by instantiation) a definition of truth for L .

The definition-schema of truth is based on rules of two kinds:

(1) Rules delineating the satisfaction conditions of ' \approx ', ' \neg ', '&', ' \vee ' and ' \exists ' (entries (B2)(3–7) below). These rules are *specific* (i.e., non-schematic, each constant is assigned its own rule) and in applications, *their content does not vary from one language to another*.

(2) Rules delineating the denotation and satisfaction conditions of ' c_0 ', ..., ' c_k ', ' f_0 ', ..., ' f_1 ', ' P_0 ', ..., ' P_m ', ' R_0 ', ..., ' R_n ' and ' x_0 ', ' x_1 ', ' x_2 ', ... (denotation and assignment functions as well as entries (A2)(1–3) and (B2)(1–2) below). These rules are schematic. They are *non-specific* (i.e., they do not distinguish between constants of the same grammatical category), and in application *their content does vary from one language to another*.

A Note on Formalization: The formalization of natural and scientific languages within the framework of TI is subject to two provisos (corresponding to the two type of rules):

(A) The symbolization of primitive expressions whose satisfaction conditions are captured by rules of type (1) is canonical: the identity predicate is always symbolized by ' \approx ', negation by ' \neg ' etc.

(B) The symbolization of primitive expressions whose satisfaction and reference conditions are captured by rules of type (2) is not canonical (i.e., the same term can be symbolized by different symbols in different formal languages), but it does preserve grammatical categories (i.e., singular terms are symbolized by individual constants, etc.).²⁸

Definition-Schema of Truth:

Given a language L , L is assigned:

- (i) A *denotation function*, d , which determines the reference of ' c_0 ', ..., ' c_k ', ' f_0 ', ..., ' f_1 ', ' P_0 ', ..., ' P_m ', and ' R_0 ', ..., ' R_n ' in a universe, A (a non-empty set of objects). $d('c_i')$ is a member of A ; $d('f_i')$ is a function from A to A ; $d('P_i')$ is a subset of A , $d('R_i')$ is a subset of $A \times A$. We refer to $d('c_i')$, $d('f_i')$, $d('P_i')$ and $d('R_i')$ as \bar{c}_i , \bar{f}_i , \bar{P}_i , and \bar{R}_i respectively.
- (ii) A class, G , of *assignment functions*, g , which assign to each individual variable, ' x_i ', of L , an object in A . We refer to $g('x_i')$ as g_i .

Principle of Applied Denotation: If L is a formalization of an interpreted language, L' , then A is (or A represents) the universe of discourse of L' , and the value assigned by d to a given constant in its domain is (represents) the denotation/extension of the corresponding constant in L' . We will say that d provides a *list of denotations* for the constants ' c_0 ', ..., ' c_k ', ' f_0 ', ..., ' f_l ', ' P_0 ', ..., ' P_m ', and ' R_0 ', ..., ' R_n ' of L based on their correlates in L' .²⁹

Truth for sentences of L is defined in three steps, corresponding to the three syntactic units defined in the syntax:

- (i) (recursive) definition of *denotation under an assignment*, g , for terms of L ;
- (ii) (recursive) definition of *truth under g* (satisfaction by g) for formulae of L ;
- (iii) definition of *truth* for sentences of L .

(A2) *Denotation _{g}* (denotation under g)

- 1. ' x_i ' denotes _{g} g_i .
- 2. ' c_i ' denotes _{g} \bar{c}_i ,
- 3. If t is a term, then ' $f_i(t)$ ' denotes _{g} $\bar{f}_i(t_g)$, where t_g is the object denoted _{g} by t .

(B2) *Truth _{g}* (truth under g , or satisfaction by g)

- 1. ' $P_i(t)$ ' is true _{g} iff $t_g \in \bar{P}_i$.
- 2. ' $R_i(t, t')$ ' is true _{g} iff $\langle t_g, t'_g \rangle \in \bar{R}_i$.
- 3. ' $t \approx t'$ ' is true _{g} iff $t_g = t'_g$.
- 4. ' $\neg\Phi$ ' is true _{g} iff Φ is **not** true _{g} .
- 5. ' $\Phi \& \Psi$ ' is true _{g} iff Φ is true _{g} **and** Ψ is true _{g} .
- 6. ' $\Phi \vee \Psi$ ' is true _{g} iff Φ is true _{g} **or** Ψ is true _{g} .
- 7. ' $\exists x_i \Phi$ ' is true _{g} iff for **some** function g^* which differs from g at most in its value for ' x_i ', Φ is true _{g^*} .³⁰

(C2) *Truth*

A sentence of L is true iff it is true _{g} for some/every $g \in G$.

This completes my outline of TI . What is TI designed to accomplish? What does it actually accomplish? I will consider two interpretations of TI . The first represents the “generalist” approach to theories of truth, the second – the approach proposed in the present paper.

3.2. *The Generalist or Reductionist Interpretation of TI*

On the generalist interpretation of TI , TI offers a general definition of truth for languages in its range, and this it does by reducing the general notion of truth (for such languages) to the restricted notion of atomic truth (for these languages). The theory’s main tool is the recursive method, and its basic distinction is that between *iterative* and *non-iterative* expressions. The iterative expressions of a language L in the range of TI are ‘ f_0 ’, ... ‘ f_l ’, ‘ \neg ’, ‘&’, ‘ \vee ’, and ‘ \exists ’; its non-iterative expressions are ‘ \approx ’, ‘ x_0 ’, ‘ x_1 ’, ‘ x_2 ’, ... ‘ c_0 ’, ... , ‘ c_k ’, ‘ P_0 ’, ... , ‘ P_m ’, and ‘ R_0 ’, ... ‘ R_n ’. The recursive entries for the iterative expressions reduce the denotation and satisfaction conditions of “complex” elements of L (terms and formulae containing iterative expressions) to the denotation and satisfaction conditions of “atomic” elements of L (terms and formulae not containing such expressions). Since all languages of “classical” mathematics and science as well as large fragments of natural language can be formalized within the syntactic framework of TI , TI is a comprehensive theory of truth.

TI , on this approach, constitutes a counterexample to our analysis of a general theory of truth in the last section. A general theory of truth is possible: the trick is to reduce the large, unmanageable collection of *all truths* (of a given language) to the small, manageable collection of *atomic truths* (of that language). The problem with this approach, however, is that TI is incapable of providing a *substantive* account of atomic truth. The atomic entries in the definition of truth (denotation, satisfaction) for specific languages are essentially based on *lists of denotations*, and as such they fail to provide an *informative* account of the truth (denotation, satisfaction) conditions of the atomic sentences (terms, formulae) of these languages (Field 1972). Thus, consider the radically different conditions under which the atomic sentences ‘2 is even’ and ‘The Rite of Spring is sublime’ are true. TI simply lacks the resources for a substantive account of their differences.

Our analysis of the difficulties facing the theory of truth in the last section explains why this is so. TI reduces the multiplicity of truth conditions

of sentences of its languages by no more than one factor – the iterative factor; beyond that, the enormous diversity of truth conditions is *merely shifted* to the domain of atomic sentences. Abstract and concrete sentences, mathematical, moral, physical, and even logical (i.e., identity) sentences, all populate the atomic realm; as a result, the tension between generality and specificity is at its peak in that realm. The atomic truths of *T1* do not exhibit sufficient *substantive unity* for a unified method of specifying their *substantive truth conditions* to be feasible.³¹

3.3. *The Specialist or Logical Interpretation of T1*

On the specialist interpretation, *T1* is a theory of a *special* aspect of truth, namely the logical aspect. The basic distinction in *T1* is that between what I will call *distinguished* and *non-distinguished* constants. Constants treated by rules (entries) of type (1) are distinguished, those treated by rules (entries) of type (2) are non-distinguished. (See introductory paragraphs to the semantics of *T1* above.) Each distinguished constant is assigned a *specific* satisfaction condition, *fixed* across languages. We may say that the *distinguished elements of T1 are those elements which are singled out in the syntax for a fixed, specific treatment in the semantics*. In contrast, the non-distinguished constants of *T1* are treated “en masse”: all constants of the same grammatical category are grouped under a single schematic entry, and in different languages this entry is instantiated by different denotation/satisfaction conditions. The non-distinguished elements play an auxiliary role in *T1*: they constitute the most basic arguments of the distinguished elements, and it is through them that the theory is applied to particular languages.³²

T1, on this interpretation, is a theory of the contribution of *D-structure*, i.e., structure generated by distinguished constants, to truth. *T1* is designed to explain how being governed by a distinguished constant (‘or’, ‘some’, ...) affects the truth conditions of a sentence, not how being governed by a non-distinguished constant (‘is even’, ‘is sublime’, ...) affects its truth conditions. The key to understanding *T1* is understanding *D-structure*; and the key to understanding *D-structure* is understanding the distinguished constants. Now, it is a distinctive characteristic of *T1* that all its distinguished constants are *logical* and *all* the standard *logical constants* are distinguished in it. Therefore *T1* is a theory of the contribution of *logical structure* to truth, i.e., a theory of *truth as a function of logical structure*.³³

This analysis allows us to explain why *T1* is restricted to a range of *logical languages*, as well as why *T1* is naturally incorporated in the definitions of *logical concepts* (‘logical truth’, ‘logical consequence’, ‘logical equivalence’, ‘logical consistency’, etc.). Let me elaborate: (i) It is often

taken for granted that a formalization of an arbitrary fragment of natural language involves the assignment of a distinguished status to (specifically) logical constants. But, in principle, there are many ways to formalize a given discourse, e.g., by assigning a privileged status to modal, or epistemic, or physical, or biological constants. The logical interpretation of *TI* explains why in the case of *TI* it is the logical constants that are assigned this status. *TI* is concerned with the logical aspect of truth, therefore in formalizing natural languages *TI* distinguishes their logical from their non-logical vocabulary rather than, say, their biological from their non-biological vocabulary. (ii) The definitions of *logical consequence* and other logical notions incorporate a definition of *truth* as a major component. But not any definition of truth will do. The bridge between ‘truth’ and ‘logical consequence’ are the *logical* constants, and to serve as a basis for a definition of logical consequence a theory of truth must provide a specific account of the contribution of logical constants to truth. *TI* satisfies this requirement. Had the distinguished constants of *TI* been epistemic or biological, *TI* would have given rise to the notion of epistemic or biological consequence; as things stand, *TI* partakes in the notion of *logical* consequence. (See Sher 1996a; and 1996b.)

As a theory of the logical factor in truth, *TI* exemplifies the strategy for substantive theories of truth developed in the last section. *TI* provides an account of a specific yet general factor of truth, a factor playing an indispensable role in all reasoning and discourse. A vivid example of both the pervasiveness and the partiality of the logical factor in truth is presented by the following passage from Darwin (1859, 186):

He who believes in the struggle for existence and in the principle of natural selection, will believe that every being is constantly endeavouring to increase in numbers; and that if any one being vary ever so little, either in habits or in structure, and thus gain an advantage over some inhabitant of the country, it will seize on the place of that inhabitant, however different it may be from its own place. Hence it will cause him no surprise that there should be geese and frigate-birds with webbed feet, either living on the dry land or most rarely alighting on the water; that there should be long-toed corncrakes living in meadows instead of swamps; that there should be woodpeckers where not a tree grows; that there should be diving thrushes, and petrels with the habits of auks. [My emphases.]

Notice how prevalent the logical factor is in this passage, yet how partial its influence is. The logical factor is intertwined with a host of other factors, and the *truth* (*falsity*, general validity or invalidity) of the cited paragraph is the combined result of all these factors.³⁴

3.4. *Correspondence*

On the specialist approach *TI* is a theory of a substantive factor of truth, but is it a *correspondence* theory of truth? Traditionally, a theory of truth is thought to establish correspondence (if at all) through the entries for the atomic elements of a given language, and this conception is naturally conjoined with the generalist (reductionist) interpretation of *TI*. The atomic entries of *TI* are, however, inherently unsubstantive, hence a substantive correspondence cannot be established in this way. Our analysis of theories of truth in the last section suggests a different approach: *correspondence* (like truth) is a complex and multi-dimensional relation, based on a *family of connections* between language and the world rather than on a single connection. A theory of truth may establish some connections between language and the world without establishing other connections. This conception of a partial correspondence theory of truth fits in naturally with the specialist construal of *TI*. If *TI* is a correspondence theory at all, it is a theory of one dimension of correspondence, namely the *logical dimension*. This correspondence is established by the logical entries in the definition (rather than through the atomic entries), and since the logical entries are inherently substantive, the correspondence drawn is a substantive correspondence.

But does *TI* establish logical correspondence? And what, in any case, is the logical dimension of correspondence? Consider the application of *TI* to the logically-structured sentence, ‘Something is white’. Whether the truth conditions assigned to this sentence by *TI* are correspondence conditions depends on whether the logical particle ‘something’ is treated as a referential expression. In the logico-philosophical literature, ‘something’ is construed either as a *syncategorematic* or as a *categorematic* (objectual, genuinely referential) term. On the first reading ‘something’ represents a purely linguistic operation, say, infinite disjunction, where disjunction itself is understood as a non-objectual operation. On the second reading, ‘something’ is a genuinely denoting predicate, a 2nd-level predicate denoting the 2nd-level property of being a non-empty (1st-level) property. Now this reading, whose roots are in Frege, has recently become quite common in model theory as well as in linguistic semantics.³⁵ And under this reading the truth condition for existential quantification can be reformulated as a bona-fide correspondence condition. Roughly: ‘ $\lceil (\exists x)\Phi x \rceil$ is *true* iff the extension of $\lceil \Phi x \rceil$ is **not empty**’.³⁶ The left side of the biconditional represents a truth predication, its right side – an objectual, or “worldly” predication. The definiendum predicates the property of truth on a certain linguistic entity, the definiens – the property of non-emptiness on a certain object (set of objects) in the world. This objectual reading of the existential

quantifier can naturally be extended to identity and the truth-functional connectives. Identity is almost always construed as an objectual relation, and in Boole (1854) as well as in model-theoretic definability theory the truth-functional connectives are also construed as objectual operators. Reformulating the logical entries of *TI* in light of this analysis, we obtain the following instantiations: ‘ $\lceil \text{White (pegasus) \& Winged (pegasus)} \rceil$ is TRUE iff Pegasus is in the **intersection** of the set of white things and the set of winged things’; ‘ $\lceil (\exists x)\text{White } x \rceil$ is TRUE iff the set of white things is **not empty**’; ‘ $\lceil (\exists x)(\text{White } x \& \neg(x \approx \text{pegasus})) \rceil$ is TRUE iff the **intersection** of the set of white things with the **complement** of the set of things **identical** to Pegasus is **not empty**’, etc. More precisely, and using familiar symbolic notation and terminology as well as obvious abbreviations: ‘ $\lceil \text{White (pegasus) \& Winged (pegasus)} \rceil$ is TRUE iff $\text{ref}(\text{'pegasus'}) \in \text{ext}(\text{'White } x') \cap \text{ext}(\text{'Winged } x')$ ’; ‘ $\lceil (\exists x)\text{White } x \rceil$ is TRUE iff $\text{ext}(\text{'White } x') \neq \phi$ ’; ‘ $\lceil (\exists x)(\text{White } x \& \neg(x \approx \text{pegasus})) \rceil$ is TRUE iff $\text{ext}(\text{'White } x') \cap \text{compl}\{a : a = \text{ref}(\text{'pegasus'})\} \neq \phi$ ’; etc. I conclude that in its present form *TI* can be interpreted either as a correspondence or as a non-correspondence theory, but a reformulation of its logical entries in accordance with the above principles will render it a bona-fide correspondence theory. As a correspondence theory *TI* accounts for the truth value of logically complex sentences in terms of a correspondence relation between the logical constants and properties (relations, operations) in the world, leaving other aspects of the correspondence relation for other theories to deal with.

3.5. *Informativeness*

A theory of a specific factor of truth is substantive if two conditions are satisfied: (a) the factor investigated is substantive, (b) the account of this factor is substantive. ‘Substantive’ in these conditions carries different connotations: ‘important’, ‘central’, ‘worth studying’ in the first; ‘informative’, ‘explanatory’ in the second. As a theory of the logical factor in truth *TI* satisfies the first condition; but does it satisfy the second?

The quest for an *informative* theory of truth carries us, once again, beyond the boundaries of *TI*. As they stand, the entries for the logically-structured formulae in *TI* are not really informative. These entries say, in effect, that ‘ $\lceil \Phi \text{ or } \Psi \rceil$ is true iff Φ is true **or** Ψ is true, ‘ $\lceil \text{Some } x \text{ is } \Phi \rceil$ is true iff **some** individual in the universe satisfies Φ , etc. If ‘or’ or ‘some’ in the definiendum is unclear or ambiguous (e.g., if it is not clear whether ‘or’ in *L* is exclusive or inclusive), the respective entries in the definition of truth will not assist us in removing this ambiguity. It is, however, not essential for a theory of the logical factor in truth that the logical

entries be formulated in this way. The “objectual” entry for the existential quantifier in our discussion of “correspondence” above was of a different kind: ‘ \lceil Something is Φ ’ is true iff the extension of Φ is **not empty**’. Here the explanans does not simply repeat (or offer a literal translation of) the sentence whose logical truth conditions it seeks to explain; rather, the explanans is intuitively informative. In principle, the logical entries in a theory of the logical component in truth can be made as informative as we wish. A truly informative theory, however, will do more than just explain the satisfaction conditions of individual logical constants (or rather formulae governed by such constants) in a non-trivial manner: it will explain the general principles underlying these satisfaction conditions and it will provide a criterion for logical constants. Several proposals for a general principle of logicality and a general criterion for logical constants can be found in the literature. Those of Tarski (1986), Peacocke (1976), Westerståhl (1976), McCarthy (1981), and Sher (1991; 1996b) are especially relevant for the theory we are presently considering.³⁷ All these proposals are naturally combined with a correspondence approach to truth along the lines indicated above; but other proposals are of course not excluded. I will (ambiguously) refer to an extension of *T1* based on the above principles as ‘*T2*’. The existence of detailed proposals exemplifying these principles (see references above) ensures the non-emptiness of this term.³⁸

3.6. *Immunity to Common Criticism*

T2, and to a large extent, *T1* (identified with its “special”, logical, interpretation), are immune to many of the criticisms directed in the literature at Tarski’s theory and some of its variants.³⁹ I will briefly consider three criticisms:

(1) *Trivial reduction*. Following Field (1972), it is widely accepted that the goal of a theory of truth (similar to Tarski’s) is to legitimize the notion of truth by reducing it to non-semantic notions. In particular, Tarski’s theory attempts to reduce truth to *primitive reference*, i.e., the reference of the primitive non-logical vocabulary of a given formalized language. Field considers two ways of specifying primitive reference: (i) specification by enumeration, (ii) specification based on a general theory of reference. On the first approach, primitive reference is determined based on lists of denotations. On the second approach, primitive reference is determined based on a general theory of reference, i.e., a theory that tells us under what conditions a name denotes an object, a predicate is satisfied by an *n*-tuple of objects, etc. This general criterion is then used to determine what specific objects are referred to by the primitive constants of particular languages. Both approaches, however, raise serious problems: The reduction of truth

to reference by enumeration is uninformative and unexplanatory (to say, for example, that ‘Rachel recognizes David’ is true iff the pair ⟨Rachel, David⟩ is in some list associated with the predicate ‘recognizes’ is to engage in an utterly worthless reduction).⁴⁰ A general, informative theory of reference would solve the problem, but the promising steps towards such a theory by Kripke (1972), Putnam (1973), Devitt (1981) and others notwithstanding, we are far from having an informative theory explicating the reference conditions of all primitive constants of any formalized language whatsoever (the reference of abstract and concrete constants, normative and descriptive constants, etc.), and the task of developing such a theory faces serious obstacles both of the kind we have discussed above (having to do with the multi-facetedness of the reference relations) and of other kinds (see below). One is naturally led to the conclusion that a general and substantive theory of primitive reference is (at least for the time being) unachievable.⁴¹

(2) *Relativity to language.* Theories of truth based on reference by enumeration are subject to an additional objection. The definition of truth in such theories is based on lists of denotations, but since the lists vary from one language to another, the defined notion is relative to language. There are (at least) two problems with a definition which relativizes truth to language: (a) the notion defined is “the wrong notion”, (b) the definition fails to satisfy minimal standards of generality. Let me briefly explain: (a) The intuitive notion of truth, the notion of truth that a philosophical theory seeks to account for, is an absolute, unrelativized notion: the notion of *truth simpliciter*. But the notion defined by lists of denotations is the notion of *truth-in-L* (where *L* is a specific language), i.e., a relativized notion. The notion defined based on reference lists is, therefore, *not* the intended notion. (b) An adequate definition of truth must satisfy certain minimal requirements of generality. In particular, the definition of truth for a language *L* must be applicable to (i) simple extensions of *L*, and (ii) languages relevantly similar to *L*. Theories based on lists of reference do not satisfy this requirement: the definition of truth is essentially restricted to the lexical items of a single language, and for each new lexical item, let alone a new language, a new definition is required. (Blackburn 1984 and others).⁴²

(3) *Indeterminacy of reference.* The idea of a general theory of reference also faces additional obstacles. Arguments based on Quine (1969), Putnam (1977; 1981; 1983) and others claim the impossibility, in principle, of a general theory which, given a language *L* in its range, uniquely determines the reference of the primitive constants of *L*. Thus, suppose \mathcal{R} is such a general theory and ‘ e_0 ’, . . . , ‘ e_n ’ are the primitive constants of *L*. Suppose

\mathcal{R} says that the referents of ‘ e_0 ’, ..., ‘ e_n ’ are, respectively, a_0, \dots, a_n . Then, assuming \mathcal{R} is formulated within the framework of some logical language, there are models of \mathcal{R} which assign different objects to some, or even all ‘ a_i ’, $0 \leq i \leq n$. This, in general, is the case even when we restrict ourselves to models whose universe is the intended universe of L . Suppose \mathfrak{A} is a model of \mathcal{R} of this kind and let ρ be any permutation of the universe of \mathfrak{A} . Then the image of \mathfrak{A} under ρ – call it ‘ \mathfrak{B} ’ – is also a model of \mathcal{R} of this kind, but the object identified as the referent of ‘ e_i ’ in \mathfrak{B} is, in general, different from the object identified as its referent in \mathfrak{A} .⁴³ Since from the point of view of \mathcal{R} all its models are equal, \mathcal{R} fails to assign *unique reference* to the primitive constants of L . It is important to note that while multiple realizability is a universal phenomenon, in the case of a theory of reference of the kind we are considering what is *multiply realized* is just the thing that, for the theory to fulfill its task, must be *uniquely realized*, namely, the reference of the primitive constants of L .

Now, it is a distinctive characteristic of all these criticisms that their target is the *non-logical* entries in the definition of truth, and for that reason these criticisms are naturally directed at the generalist (reductionist) theories whose emphasis lies on these entries. Neither the specialist version of *T1* nor *T2*, however, fall under this category. These theories restrict their account to the contribution of *logical structure* to truth and as such are immune to the above criticisms.

(1) Consider the *trivial reduction* criticism. The trivial reduction criticism (rightly) says that theories which base their account of truth on the trivial account of atomic truth (or, more precisely, on the trivial account of the non-logical atomic constituents of truth) are essentially trivial. Neither the specialist version of *T1* nor *T2*, however, purport to derive the substantive portion of their account of truth from the trivial account of these elements. From the point of *T1* and *T2* the non-logical atomic elements play a merely auxiliary role, i.e., that of supplying the logical operators with basic, “external” arguments (external relative to the logical project). The requirement of an independently informative account is, therefore, out of place for these elements, and a schematic, minimally informative account is perfectly sufficient. The informativeness requirement does apply to the account of the logical elements, but the logical entries of *T2* (if not *T1*) are intuitively informative.

(2) Similarly, the *relativity to language* criticism does not apply to either theory. This criticism concerns the putative relativity of ‘truth’ to *non-logical vocabularies* rather than to logical vocabularies, the argument being: (i) the definition reduces the notion of truth to the reference of the primitive non-logical vocabulary of a given language; (ii) non-logical ref-

erence varies from language to language; therefore (iii), the notion of truth is relative to language. The first premise, however, holds neither of *T2* nor of *T1* (in its logical interpretation). What we call ‘the notion of truth of *T2* (*T1*)’ is captured primarily by its logical entries, but the content of the logical entries does not vary from one language to another. We may say that the *applications* of *T2* and *T1* vary from language to language, but their account of the logical factor in truth is the same for all languages.

An analogy with mathematics might be helpful here. Consider cardinal arithmetic, for example. Cardinal arithmetic specifies rules for adding, subtracting, multiplying, etc., the cardinalities of pairwise disjoint sets of any kind; similarly, *T2* specifies rules for computing the truth values of logically-structured statements with non-logical vocabularies of any kinds. The rule for addition is essentially the same for sets of apples and sets of oranges; likewise, the rules for identity, negation, conjunction, etc. are the same for discourse about apples as for discourse about oranges. Cardinal arithmetic is not essentially relative to universes of urelements, and similarly, *T2* and (the logical version of) *T1* are not essentially relative to non-logical vocabularies.

(3) Finally, the *indeterminacy* criticism takes it for granted that a theory of truth requires a unique determination of the reference of the non-logical vocabulary of languages in its range. In the case of *T2* (and the logical version of *T1*), however, this assumption does not hold. The satisfaction conditions of the logical constants take into account only “structural” features of (the referents of) their arguments, and as a result, variations in reference involving only non-structural changes do not affect this factor. But the variations considered in the indeterminacy criticism are just of this kind. Variations of reference induced by permutations, for example, preserve formal structure, hence the satisfaction conditions of logically structured formulae are not affected by these variations. Let me explain. Consider the sentence ‘ $P_0c_0 \ \& \ P_1c_0$ ’ of a given language *L* in the range of languages of *T2* (or *T1*). As far as the conditions associated with the logical structure of this sentence are concerned, it does not matter what the exact referents of ‘ P_0 ’, ‘ c_0 ’ and ‘ P_1 ’ are. All that matters is whether the object referred to by ‘ c_0 ’ (whatever it is) is in the **intersection** of the extensions of ‘ P_0 ’ and ‘ P_1 ’ (whatever these are). But intersections are preserved under permutations; hence the logical component in the truth value of ‘ $P_0c_0 \ \& \ P_1c_0$ ’ is indifferent to variations in reference obtained by permutation. I conclude that neither *T2* nor the logical version of *T1* is affected by indeterminacy of non-logical reference.⁴⁴

In contrast, the “generalist” version of *T1* is vulnerable to all three criticisms: its attempt to reduce the general notion of truth to that of atomic

truth yields an uninformative account of truth, this account is relative to language, and any attempt to establish it based on a general theory of reference is likely to falter due to (among other things) the indeterminacy of primitive reference.

This completes my demonstration of the possibility of constructing a substantive theory of truth based on the strategy outlined in the last section. The theory *T2* is a theory of a substantive and relatively general factor of truth, namely the logical factor, its treatment of this factor is informative, and the common criticisms of current theories of truth do not apply to this theory.

4. A FAMILY OF THEORIES OF TRUTH

Truth is a multi-faceted phenomenon. The *truth* of a sentence (like, say, the *life* of a person) is the outcome of many factors acting on different levels along, and sometimes against, one another. Accordingly, the *theory* of truth is a *family* of theories: a collection or system of theories, each investigating some substantive factor or aspect of truth, and together (in the ideal limit) providing an exhaustive account of this phenomenon.

I have not been the first to note the multiplicity of facets of truth: Dummett (1978) regards the realist notion of truth as relative to contexts of discourse (realism about the past, realism about the future, realism in mathematical discourse, etc.); Davidson (1969; 1970; 1980) correlates various types of truth (truth of action sentences, truth of belief sentences, etc.) with different extensions of Tarski's definition; Resnik (1990) thinks of a variety of bases for the correspondence relation; Devitt (1991) conceives of the concept of truth as "truth(*x*)": "truth(physical)", "truth(ethical)", etc.; and Wright (1992) allows for "pluralism" in the *substance*, if not the *form*, of truth.

Nor are the problems leading to the present methodology unique to truth. We have already noted the similarity between truth and certain broad and multi-faceted scientific concepts (e.g., *life* and *nature*), and philosophical concepts, in general, are notorious for their breadth and intractability. *Knowledge*, *object*, *meaning*, *reference* are all concepts for which the idea of a common denominator captured by a single, simple formula is highly appealing, yet also highly problematic and rarely fruitful. (Recall the endless, and eventually fruitless, exchanges of examples and counter-examples over the single-formula definition, "knowledge = justified true belief".) These philosophical concepts mark a large and diverse area of action, observation, theorizing and conceptualization, with partial resemblances and partial unities, but also deep gaps and discontinuities. These concepts natu-

rally fall under Wittgenstein's (1958) "family resemblance" and Putnam's (1978) "structurally complex concepts" categories, and as such they resist a simple common denominator characterization. This, however, is not to say that a substantive study of these concepts is impossible. The lesson from the inherent complexity of truth is not that truth cannot be studied by a substantive philosophical theory; the lesson is that truth cannot be studied based on a *G1* or even a *G2* strategy. Our intermediate strategy ($G2\frac{1}{2}$, *S2*) offers a viable alternative. This strategy calls for a study of truth on its own terms, a study aiming at an optimal balance between generality and substance.

This methodology should not be confused with a piecemeal methodology. The family of theories of truth is not an haphazard array of disconnected theories. On the contrary: the family of theories of *truth*, like the family of theories of *nature*, aims to establish general and systematic connections between seemingly disconnected phenomena; not, however, by oversimplifying complexities and differences, but based on a genuine understanding of common principles and interrelations. Take *T2*, for example. This theory collects a large number of determinants into a single *factor* and offers a unified and systematic account of this factor.

The idea of a family of theories of truth raises many questions that I will not be able to address here. I would like, however, to briefly explain my approach to two of these questions: (1) What theories, and what *kind* of theories, in addition to *T2*, are to be included in the family of theories of truth? (2) What is the division of labor between science and philosophy in this family? An adequate consideration of these questions would carry us far beyond the boundaries of the present paper, but briefly and tentatively my view is as follows:

4.1. *Philosophy and the Sciences*

There is an intuitive sense in which it is presumptuous (and futile) for the philosopher to provide an exhaustive account of the truth conditions of sentences. There is a sense in which to understand why a certain sentence is true we have to turn to the sciences. To understand why (in virtue of what) the Löwenheim–Skolem theorem is true we have to turn to model theory; to understand why creationism is not true we have to turn to modern physics and biology as well as to theology and scientific methodology; to understand why 'Picasso revolutionized modern art' is true we have to turn to art history, and so on and so forth. Using the terminology introduced in Section I we may say that if truth is reducible to objectual predication, then to understand under what conditions a sentence is true is to understand under what conditions the objects referred to by this sentence possess the

properties (stand in the relations) attributed to them by it. And such an understanding is (generally) obtained in the sciences.

One natural reaction to this observation is to distinguish between understanding *truth* and understanding '*truth*': The philosopher's task is to explain the *concept of truth*, the scientist's – to discover *truths* and explain their objectual grounds. Such a "division of labor" between philosophy and the sciences was advocated by the logical positivists, but (with Quine) I believe this division is illusory: we cannot achieve a substantive understanding of a concept *X* without knowing the laws governing the objects (properties, relations, phenomena) falling under *X*. We cannot understand the notion of set apart from the laws governing the "behavior" of sets, and we cannot understand the notion of truth without knowing the general principles under which physical, mathematical, ethical, . . . statements are true: the search for *truth* and the understanding of '*truth*' are inextricably tied up with each other. Nevertheless the philosophical viewpoint has its own special range of interests, and these determine a special subfamily of theories of truth.

4.2. *Philosophical Theories of Truth*

I will not attempt to draw a systematic "map" of the philosophical theories of truth. (I doubt that such a map can be drawn a priori, i.e., prior to the actual construction of such theories.) But some philosophical theories likely to appear on such a map are the following: (a) theories of inherently philosophical types of truth: ethical truth, metaphysical truth, logical truth, etc.; (b) theories investigating general philosophical categories of truths: abstract truth, empirical truth, etc.; (c) theories investigating the reducibility of certain kinds of truth to others: mental truth to physical truth, etc. (Field's (1980) project falls under this category); (d) theories investigating the relation between truth and other subjects of philosophical inquiry: truth and knowledge, truth and rationality, truth and ontology, etc.; (e) theories tackling special questions concerning truth: Is the correspondence approach to truth committed to a picture theory of language (the view that language is a *mirror* of reality)? Is the molecular approach to truth (characteristic of all theories associated with Tarski) compatible with a holistic epistemology? What is the relation between the normative and the descriptive element in truth? etc.

I would like to conclude with a few words on the issue of a substantive universal principle of truth. My analysis of the problematics of truth leaves the existence of such a principle an open question. I do not claim that such a principle does not exist, but I do argue: (1) that a universal principle of truth is not necessary for a substantive philosophical theory of truth, (2) that a

trivial principle cannot serve as a basis for such a theory, (3) that given the great complexity and multi-dimensionality of truth the likelihood of a substantive universal principle of truth is quite low, and (4), that in view of the above, the existence of such a principle should not be postulated in advance, but its existence should be established (or refuted) through a substantive philosophical investigation.

NOTES

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¹ For exegetical issues concerning the Aristotelian text see Kirwan (1971, 117).

² For the way in which 'logical consequence' exhibits this duality see Sher (1996a; 1996b).

³ (a) Of course, the definiens of a *T*-biconditional may refer to linguistic entities, but these entities are then treated as "worldly objects" rather than as symbols. When speaking of "worldly" objects (properties, relations) I do not restrict myself to "concrete" or physical objects (properties, relations). (b) We can extend the present analysis to complex sentences (truth-functional or quantificational) using familiar model-theoretic methods. For example, $\ulcorner \text{Snow is white} \ \& \ \text{snow is cold} \urcorner$ predicates the property of being both white and cold of snow, $\ulcorner \text{Something is white} \urcorner$ predicates the 2nd-level property of non-emptiness of the 1st-level property of being white, (or, extensionally, of the set of white things) (see Frege 1884), and so on. (c) Note that on the analysis proposed here the *T*-Schema does not involve a commitment to facts, and as a result, the objections to correspondence based on its alleged commitment to facts (see, e.g., Strawson 1950; and 1965) do not apply to our analysis. (Generally, whether the *T*-Schema involves a commitment to facts depends on how the correspondence relation is set up, i.e., on what is taken to correspond to what. Traditionally, the *T*-Schema is viewed as setting a correspondence between *truth bearers* – sentences, statements, propositions, beliefs – schematized by ' $\langle \sigma \rangle$ ', and *facts*, schematized by ' $\bar{\sigma}$ '. For example, the true *sentence* 'Snow is white' corresponds to the *fact* that snow is white. But on the present analysis what the schema schematically "equates" is not a *name of a sentence* and a *name of a fact*, but *two sentences*: $\ulcorner \text{True} \langle \sigma \rangle \urcorner$ and $\bar{\sigma}$ – i.e., a sentence that says of 'Snow is white' that it has the property of being true, and a sentence that says of the stuff snow that it has the property of being white. Semantics reduces *linguistic* to *objectual* predications, and objectual predications are *not* names of facts. Objectual predications relate objects to properties (relations), but they do not commit us to the existence of facts. For a different argument to the effect that the correspondence conception of truth does not involve a commitment to facts see Davidson (1969).)

⁴ As one of the reviewers of this paper has pointed out to me, Lewis Carroll's spelling of 'borogroves' is 'borogoves'.

⁵ Note that the medieval distinction between 'formal' and 'material' is opposite to what one would expect. In the 'suppositio formalis' mode we view a term as standing for what it "signifies" or denotes; in the 'suppositio materialis' mode we view it as a linguistic expression. (See Brody 1967, 75).

⁶ As noted in fn. 3(a), my notion of "world" here is broad enough to accommodate various contexts. For the sake of simplicity, however, I assume the contexts we are dealing with are extensional. The problems and solutions discussed in this paper, however, apply to truth in intensional as well as extensional contexts.

⁷ (a) Unlike Field and other contemporary writers, I do not center my quest for an informative definition of truth on the reference relation. My question is *not* whether we can explain in an informative manner in virtue of what a given sound or inscription is connected with object *a* rather than object *b*. My question is whether, *given* a correlation between symbols and objects, we can express the truth conditions of sentences of a given language in an informative manner. In taking the reference relation as given I follow Tarski (1933). A broader discussion will relate to the difficulties involved with the theory of reference. But since the triviality problem of reference is very similar to that of truth, both my analysis and my solution of the latter can be easily adapted to the former. (b) While from the point of view of my present interests a homophonic definition of truth is unacceptable, I do not wish to rule out the usefulness of a homophonic account of truth for other purposes.

⁸ Following Hartman & Schwarz's translation of Kant (1800), I am changing the Kemp Smith translation of 'Erkenntnis' from 'knowledge' to 'cognition'.

⁹ In this section I disregard the need to restrict the notion of truth in order to avoid the semantic paradoxes.

¹⁰ Frege emphasizes both needs: the need to distinguish one number from another and the need to distinguish numbers from non-numbers.

¹¹ (a) In analyzing Kant's arguments I have obviously generalized his criticism from the original context (the traditional metaphysical approach) to that of a theory of truth in general. (See first paragraph of the present section.) (b) Grover attributes to Davidson (1990a) an observation similar to the above: "A correspondence relation that fails to distinguish between true sentences is unlikely to capture the interest of those seeking an explanatory role for truth (Grover 1992, 33). (c) It should be noted that the analogy between 'truth' and 'number' goes only part way in explaining Kant's point. In particular, in the case of number we do have definitions which account both for the similarities between numbers and for their differences. My conception of a substantive theory of truth below allows theories of truth to account for differences among their objects just like theories of numbers.

¹² Blackburn himself does not endorse this argument. A philosopher who does endorse a similar argument is Ayer (1963, 169).

¹³ Davidson (1996) justly characterizes this assumption as "folly".

¹⁴ Kant does not seem to distinguish between "manageable" and "unmanageable" differences between truths, i.e., differences that can and differences that cannot be accounted for by a single substantive principle (or by a unified array of such principles). Such a distinction will play a key role in my solution to the problem.

¹⁵ More generally, we would talk about determinants of truth value. For example, if John's feelings towards Mary explain (determine) the truth of 'John loves Mary', then they (presumably) also explain the falsity of 'John hates Mary'. Note, however, that instead of saying that John's feelings explain the falsity of 'John hates Mary' we can say that John's

feelings, together with the logical determinant associated with ‘NOT’ explain the truth of ‘NOT (John hates Mary)’. Logical determinants will be discussed in the next section.

¹⁶ Using ‘ Tx ’ for ‘ x is true’ and ‘ Dxy ’ for ‘ x is a substantive determinant of y ’, we can disambiguate (S1)–(S3) as follows (I adhere to the convention that the scope of ‘&’ is narrower than that of ‘ \rightarrow ’):

$$(S1): \forall x \forall y [Tx \ \& \ Ty \ \& \ x \neq y \rightarrow \sim \exists z (Dzx \ \& \ Dzy)]$$

$$(S2): \exists x \exists y [Tx \ \& \ Ty \ \& \ x \neq y \ \& \ \sim \exists z (Dzx \ \& \ Dzy)]$$

$$(S3): \forall x \forall y [Tx \ \& \ Ty \ \& \ x \neq y \rightarrow \exists z (Dzx \leftrightarrow \neg Dzy)]$$

¹⁷ In a weaker version we will replace ‘determinant’ by ‘determinants’.

¹⁸ The weaker version of *G1* (see footnote 17) is committed to the existential assumption: *There is at least one substantive determinant of truth & all truths share all their substantive determinants.*

¹⁹ Formally:

$$E(G1): \exists z \forall x [Tx \rightarrow Dzx \ \& \ \forall z' (Dz'x \rightarrow z' = z)]$$

$$E(G2): \exists z \forall x [Tx \rightarrow Dzx]$$

$$E(G3): \exists z \exists x [Tx \ \& \ Dzx]$$

The weaker version of *E(G1)* is: $\exists z \forall x [Tx \rightarrow Dzx] \ \& \ \forall x \forall x' [Tx \ \& \ Tx' \rightarrow \forall z (Dzx \leftrightarrow Dz'x)]$.

²⁰ Note, for example, Wright’s (1992) characterization of *minimalism* (a variant of *deflationism*): “The root idea . . . is that we should not look for more of a truth predicate than its compliance with a certain set of . . . *platitudes* . . . [T]he proper minimalist account will enshrine satisfaction of the *platitudes* . . . as both necessary and sufficient for a predicate defined over a particular discourse to qualify as a truth predicate for it.” (34–5. The second italicization is mine.) Wright’s own view is a combination of minimalism and pluralism about truth. (See Wright 1992; 23 fn, 38, 52, 141. See also Wright 1998.)

²¹ The replacement of determinants by factors does not affect the the table of strategies above. An example of a relatively general and intuitively substantive factor of truth will be given in the next section.

²² Kant, Blackburn and Ayer all offer their own positive solutions to the problems raised in their arguments. regrettably, I will not be able to discuss their solutions here. All the solutions involve changing some of the basic parameters of the problem. In Kant’s case the solution involves his entire critical enterprise. For a discussion of Kant’s claim that his own theory (unlike Berkeley’s) does produce (something akin to) a general criterion of truth see Förster (1985).

²³ For discussions of scientific unity vs. plurality, see, for example, Kitcher (1981), Weinberg (1992), and Galison & Stump (1996).

²⁴ In what follows I will sometimes use ‘definition’ when ‘method’ is intended. The intended meaning will be clear from the context. Strictly, ‘definition’ refers to a particular application of the method (i.e., an application to a particular language). The fact that *T1* provides a *unified method* for defining truth rather than a *single definition* of

truth is important for its satisfaction of our methodological requirement of generality and substantiveness.

²⁵ Formally, S is freely generated from a base B by operations f_1, f_2, \dots iff (i) S is generated from B by f_1, f_2, \dots (i.e., S is the smallest set which includes B and is closed under f_1, f_2, \dots), (ii) f_1, f_2, \dots are 1-1, and (iii) $B, Rng_S(f_1), Rng_S(f_2), \dots$ are pairwise disjoint. (By ' $Rng_S(f_i)$ ' I mean the range of f_i restricted to S). See Enderton (1972, 27).

²⁶ The question of languages with variables of infinite order or with predicates/functions of infinite arity is not discussed in this paper.

²⁷ New defined expressions can be added to the basic vocabulary of L , but for the sake of simplicity, I will disregard this possibility here.

²⁸ The notion of formalization is a familiar yet complex notion. Aside from a few clarificatory remarks, I will not elaborate on it here.

²⁹ Of course, the same formal syntax can be used to represent any number of natural and scientific languages, in which case it will be assigned a multiplicity of universes and denotation lists. To simplify the discussion, I will assume that each language L represents at most a single natural/scientific language. If L does not represent any such language, we assign it a universe and a denotation function at will.

³⁰ There are various ways of formulating the definiens in entries (B2)(3-7). This issue is relevant to our investigation and I will return to it shortly.

³¹ In this regard, contrast the highly heterogeneous atomic realm of Tarski's theory with the more homogeneous atomic realms of other reductive theories (e.g., Carnap's (1967) and Field's (1980)).

³² Note the difference between the *distinguished-nondistinguished* distinction and the *iterative-noniterative* distinction: while ' \approx ' is a distinguished constant, it is not an iterative constant, and while ' f_0, \dots, f_l ' are iterative constants, they are not distinguished constants.

³³ (a) Several philosophers have commented on the differential treatment of the logical and non-logical constants in theories of truth associated with Tarski. Thus, Friedman (1979, 376) says: "The only general assertions contained in TI [a Tarskian theory similar to the one presented here] concern the interaction of 'Tr' and 'sat' [the truth and satisfaction predicates, respectively] with the *logical* vocabulary. TI makes *no* general claims about the *non-logical* vocabulary of L ." [My emphasis]. For another aspect of the logical-nonlogical distinction see Harman (1974). Davidson's attitude towards the distinction is ambivalent. (See his 1967; 1970; 1973; and 1990b). Etchemendy (1990) is especially important in introducing the distinction between "fixed" (distinguished) and "not-fixed" (non-distinguished) terms. (b) Note that in some logical languages, the influence of logical structure on truth is not fully captured by rules associated with individual logical constants. In particular, in languages with branching or partially-ordered quantifier-prefixes the logical factor involves the ordering of quantifier prefixes. (See Henkin 1961; Hintikka 1973 and 1996; Barwise 1979; Hodges 1997; Sher 1997; and others). I will not discuss this aspect of logical structure here.

³⁴ Putnam (1978, 4) notes the partiality of Tarski's account of truth: "what Tarski has done is to give us a perfectly correct account of the formal logic of the concept 'true'. But the formal logic of the concept is not all there is to the notion of truth."

³⁵ For discussions, examples and bibliographical lists see Mostowski (1957), Lindström (1966), Barwise & Cooper (1981), Barwise & Feferman (1985), Westerståhl (1985), Van Benthem (1986), Keenan (1987), May (1989), Sher (1991) and others.

³⁶ An intuitionist may wish to formulate this condition in different terms.

³⁷ For related proposals in the logico-linguistic literature, see some of the works mentioned in footnote 35 above.

³⁸ All the proposals referred to above will yield a bivalent $T2$. In principle, however, my approach does not rule out a non-bivalent conception of the logical factor in truth.

³⁹ By claiming that $T2$ is immune to these criticisms I do not wish to imply that Tarski's original theory is not. The exegetical issues involved in adjudicating this question are beyond the scope of the present paper.

⁴⁰ For Field's paradigm of a trivial definition see end of Section I above.

⁴¹ (a) In formulating Field's criticism I have abstracted from his demand that the substantive reduction of truth be based on physicalistic principles. (For a discussion of this point see Soames (1984).) (b) Since 1972 great advances have been made in the development of a causal theory of reference for non-logical terms. See, e.g., Putnam (1975) and Devitt (1981). Still, we are far from having a unified and substantive theory of reference for all non-logical terms (including mathematical terms, abstract scientific terms, etc.), and it is widely doubted that such a theory is achievable. (c) Obviously, my use of ' $T1$ ' and ' $T2$ ' is not intended to simulate Field's.

⁴² See also Field (1972, 91). Field, however, does not regard this feature as a "flaw".

⁴³ A sufficient condition for difference in the reference of ' e_0 ', ..., ' e_n ' in \mathfrak{A} and \mathfrak{B} is: for some ' e_i ', $0 \leq i \leq n$, the reference of ' e_i ' in \mathfrak{A} is not closed under p . [In this connection, see Keenan 1995.]

⁴⁴ For a further development of this point of view see Sher (forthcoming).

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