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Abstracts of the Papers

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ABSTRACTS OF THE PAPERS

A LOGICAL ANALYSIS OF SINGULAR TERMS

Jean-Yves Béziau

We analyse the behaviour of definite descriptions and proper names terms in mathematical logic. We show that in formal arithmetic, whether some axioms are fixed or not, proper names cannot be considered rigid designators and have the same behaviour as definite descriptions. In set theory, sometimes two names for the same object are introduced. It seems that this can be explained by the notion of meaning. The meaning of such proper names can be considered as fuzzy sets of equivalent co-designative definite descriptions and their references as sets of all equivalent co-designative definite descriptions.



BROADENING AND DEEPENING YOES: THE THEORY OF CONDITIONAL ELEMENTS

Joseph S. Fulda

We put forth a theory of conditional elements which can be used to dismiss apparent challenges to the truth-functionality of the conditional without apparent circularity. In the process, we refine the ideas of Yoes, published in an earlier paper in this journal, broadening and deepening them.



CRITICAL COMMENTS ON LAUDAN'S THEORY OF SCIENTIFIC AIMS

Armando Cíntora

Laudan's proposed constraints on cognitive aims are criticized. It is argued that: (i) Laudan does not distinguish impossible goals from impossible but approachable goals; and owing to that imprecision Laudan recommends conservatism and mediocrity. (ii) Impossible but approachable goals can be rational objectives, if we understand means/ends rationality as the attitude of someone who tries to reach the warranted optimum means to the attainment of **or approximation** to his desired aims. (iii) Ideals

cannot be dispensed with, because in advance there is no satisfactory way of specifying how close to the ideal, or how far from it, is good enough. (iv) Laudan's recommendation is too restrictive and counter-intuitive because it characterizes idealist conduct (such as that of saints, heroes, and martyrs) as irrational. (v) A life's struggle for a utopian and a very valuable aim can cause lasting emotions of self-respect or self-esteem — at least for certain temperaments, and in some social settings — and those emotions are necessary for a good life; therefore, the search for impossible but approachable valuable goals, and their accompanying positive emotions, may be a rational goal. (vi) Laudan's banning of 'semantically utopian' and 'epistemically utopian' aims is also too restrictive, because we often pursue an end that is obscure for the conscious mind; in such cases, we still try to approach the obscure aim, by the *via negativa*, that is, by eliminating what it is not. (vii) Laudan needs to invoke some 'pre-philosophical' cognitive canons of scientific success, and those 'pre-philosophical' canons cannot be justified empirically as valuable without invoking some intuitions about genuine examples of successful science — even though Laudan has told us that his meta-methodology does not require intuitions. (viii) Furthermore Laudan does not justify his prioritization of his pragmatic canons of scientific success; Laudan's prioritization has a dogmatic character.



**COMPLEMENTARY PROPERTIES AND PERSISTING OBJECTS:
ONTOLOGICAL CONSTRAINTS ON THE SEMANTICS OF SENTENCES OF
THE TYPE 'O IS Φ AT T'**

Montse Bordes

Even the most Parmenidean-minded of people recognize that quotidian objects somehow undergo change. This claim, nonetheless, is as clearly intuitive as it is apparently incompatible with one of our most widely believed logical principles, namely, Leibniz's Law. This paper focuses briefly on the metaphysical issue underlying this alleged incompatibility in order to provide elements for exploring its semantical counterpart: the analysis of the logical form of sentences attributing complementary temporal properties to current objects. Four analyses are presented, and the ability of each to account for the linguistic data is explained. The semantical issue is preceded by some introductory remarks on the role of temporal references in the evaluation of declarative sentences.



THE CAUSAL ATTAINMENT THEORY OF TEMPORAL PASSAGE

Brooke Alan Trisel

In recent years, efforts in the philosophy of time have focused on resolving the antinomy between the «becoming» and «becomingless» views. Although these views have frequently been thought of as being polarized, they both spatialize time. One reason that time has been spatialized is because the spatially-related meanings of 'near' and 'distant' have been substituted for the temporally-related meanings. Accordingly,

an attempt is made to elucidate the meanings of these words through a phenomenological and linguistic analysis. It is postulated that the temporally-related locutions 'near' and 'distant' reflect the degree to which the necessary conditions for an event have been met. This postulate, which is the foundation of the proposed theory, appears to account for the impression that events «approach» the present without leading to the types of difficulties which have encumbered the becoming and becomingless views.



HEREAFTER, IN A LATER WORLD THAN THIS?

PETER J. KING

When making use of possible-worlds talk, even those who consider it to be no more than a heuristic device must be careful to treat possible worlds *as if* they were real; not to do so is to risk making use, not of possible worlds at all, but of some other, vague, and potentially misleading notion. I argue that transworld temporality is one danger area of this kind, and try to bring this out by examining John Bigelow's use of possible worlds to defend the reality of time against McTaggartian arguments. I conclude that Bigelow's defence fails because of his appeal to temporal relations between possible worlds.

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A logical analysis of singular terms

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A LOGICAL ANALYSIS OF SINGULAR TERMS

Jean-Yves Béziau

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0. Introduction

In philosophy of language, an expression of the type «Brasilia» is considered a *proper name* and an expression of the type «The capital of Brazil» a *definite description*, both being considered *singular terms* by opposition to an expression of the type «Brazilians», considered a *general term*.

A singular term generally *denotes* an object, its *reference* or *denotation*. Some people say that the difference between proper names and definite descriptions is that the latter, besides a reference, have a *meaning*, but not the former.

The meaning can be understood as «the way the reference is given» (Frege 1892, p.26), or «what is grasped when one understands» (Church 1956, p.7) an expression. It

is supposed to be expressed by the structure of the expression and to be objective rather than subjective or psychological. Proper names generally are expressions with no structure or an irrelevant one such as «Rio de Janeiro», which in Portuguese means «River of January».

According to Kripke (cf. Kripke 1980), the difference between definite descriptions and proper names is that the latter are *rigid designators* in the sense that they denote the same thing in all possible worlds, by opposition to definite descriptions whose denotation may vary (we will use hereafter the expression «Kripke's theory» to refer to this view). For example, «The capital of Brazil» in the world of 1950 denotes Rio de Janeiro and in the world of 1999 denotes Brasilia but, according to Kripke's theory, «Rio de Janeiro» denotes the same city in 1950 and in 1999.¹

These distinctions and related discussions have their origin in the work of Frege and Russell in the logical foundations of mathematics. However nowadays there are nearly no connections between these discussions and mathematical logic. The aim of this paper is to have a look at these central problems of philosophy of language from the standpoint of mathematical logic.

1. Singular terms in formal arithmetic

11. Proper names and definite descriptions in the language *LA* of arithmetic

Let us consider the standard language *LA* of Peano Arithmetic (0, s, +, x) in first-order logic with Russell's description operator ι .

We will consider that:

«0» is a proper name,

«s0» and « $\iota x(\forall y(x \times y = y))$ » are (examples of) definite descriptions.

That is to say for us *individual constants* are proper names (in this language «0» is the only proper name), any other *closed term* is a definite description. We take here «constant», «term» and «closed term» in their actual standard technical sense in mathematical logic. We consider thus that the counterpart of natural language singular terms, in a formal language, are closed terms.²

¹ We have tried here to define the main terminology in an objective way, independently of any philosophical taste. In the literature, the terminology varies in function of philosophical doctrines, for example some people consider that definite descriptions *are* proper names, that reference is different from denotation, that it is better to call «sense» what we have called meaning, etc.

² (Haack 1978, p.56) says that «Some formulations of the predicate calculus employ singular terms ('a', 'b' ... etc.) as well as variables. (...) Singular terms are usually thought of as the formal analogues of proper names in natural languages».

Let us note that what Haack here calls singular terms are usually called 'constants' in a book of mathematical logic and that the terminology 'singular terms' is rarely used in such a book...

12. Reference in arbitrary *LA*-structures

What are in this framework the denotations of proper names and definite descriptions?

Following Tarski's formal semantics for first-order logic (i.e. model theory) their denotations are relative to an *interpretation* in a given *LA*-structure (i.e. a structure corresponding to the *LA*-language).

In the standard structure \mathbf{n} , whose domain is the set of natural numbers \mathbb{N} , «0» denotes the standard number zero, that we can name « $\mathbf{n}(0)$ » to avoid any confusion, «s» denotes the standard successor function, that we can name « $\mathbf{n}(s)$ », etc. In this structure «s0» and « $\iota x(\forall y(x \times y = y))$ » have the same denotation, the number one.

But we can consider an *LA*-structure \mathbf{m} , where «0» denotes the number seven, «s» the function $x+10$ and «+» and « \times » the standard addition and multiplication. In this case «s0» and « $\iota x(\forall y(x \times y = y))$ » will not denote the same object.

In conclusion: considering the class of all *LA*-structures (taken as the «possible worlds» of philosophy of language³), neither «0» nor «s0» nor « $\iota x(\forall y(x \times y = y))$ » are rigid designators, in the sense that their references vary.⁴

Therefore if natural language was working in the same way as model theory, Kripke's theory would be meaningless.

It is not obvious, as we assume here as Haack does, that constants of a formal language are counterparts of a proper names of natural language (see the quotation of A.Church below).

³ «Possible worlds» has a relatively precise meaning in Kripke semantics for modal logic; however in the philosophy of language this expression is used in a rather general and informal way (by Kripke himself), which seems coherent with the present interpretation.

⁴ (Church, 1956, p.9) says «We adopt the mathematical usage according to which a proper name of a number is called a *constant*, and in connection with formalized language we extend this usage by removing the restriction to numbers, so that the term *constant* becomes synonymous with *proper name having a denotation*.

However, the term *constant* will often be applied also in the construction of uninterpreted calculi – logistic systems in the sense of #7 – some of the symbols or expressions being distinguished as constants just in order to treat them differently from others in giving the rules of the calculus. Ordinary the symbols or expressions thus distinguished as constants will in fact become proper names (with denotation) in at least one of the possible interpretations of the calculus.»

Thus according to Church, «0» is not a proper name, but only something like « $\mathbf{n}(0)$ » is. If we adopt strictly this point of view, « $\mathbf{n}(0)$ » is trivially a rigid designator. To be coherent, Church should consider « $\mathbf{n}(s0)$ » as a definite description and not «s0». (In fact Church considers definite descriptions proper names; see Church 1956, p.3).

One could say that we must exclude from the notion of possibility of «possible worlds» the possibility of different baptisms (If we admit that in a possible world Saul Kripke could have been named Marlon Brando and vice versa, then Kripke's theory does not work).

But it seems that on the one hand it is not clear how we can do this (in a precise and formal way) and on the other hand that this is not the only trouble, as we will see in the next section.

13. Reference in *LA*-structures which are models of the axioms *AP* of Peano Arithmetic

A framework which will perhaps put model theory closer to natural language would be to consider not arbitrary classes of structures, in our case *LA*-structures, but restricted ones.

So we consider now the case of structures which are models of the standard first-order axioms *AP* of Peano Arithmetic.

Can we say that «0» denotes always the same thing? And what about «s0» and « $\iota x(\forall y (x \times y = y))$ »?

If a *LA*-structure is a model of *AP*, it obeys certain conditions, «0», «s0» and « $\iota x(\forall y (x \times y = y))$ » cannot be interpreted in arbitrary ways. For example in all models of *AP*, «s0» and « $\iota x(\forall y (x \times y = y))$ » denote one and the same object, because $AP \vdash s0 = \iota x(\forall y (x \times y = y))$.

Now let us explain why «0», even in this case of restricted *LA*-structures, does not always denote the same object and therefore is not a rigid designator.

Given any two mathematical structures *m1* and *m2*, how can we say that an object o_1 of the domain of *m1* is the same object as an object o_2 of the domain of *m2*? The «identity» of an object in a mathematical structure is determined by its position in this structure, i.e. the relations it has with other objects of the structure. Therefore o_1 and o_2 are the same object iff there is an isomorphism *f* from *m1* to *m2* such that $f(o_1) = o_2$.

It is well-known that first-order arithmetic *AP* is not categorical, that therefore there are two non-isomorphic models of *AP*, for example the standard model *n* and a non-standard model *m*. Despite the axioms of arithmetic, «0» does not denote the same object in these two structures, because «0» does not stand in the same position in *n* and *m*. For example, in *n* any object of the domain can be reached from «0» applying the successor function but this is not the case in *m*.

In fact, as *AP* is incomplete, such differences can be expressed by first-order properties.⁵ Consider a formula *F* which is independent in *AP*, i.e such that: $AP \not\vdash F$ and $AP \not\vdash \neg F$. Then there exist a model *m1* of *AP* in which *F* is false and a model *m2* of *AP* in which $\neg F$ is false, therefore in which *F* is true. Now given any property *P* about «0»

⁵ In the case of a first-order theory, which is complete but not categorical, the differences cannot be expressed by first-order properties.

such that $AP \vdash P(0)$, in $m1$, $F \wedge P(0)$ is false and in $m2$, $F \wedge P(0)$ is true. Notice that $P(0)$ can be a formula that says nothing about «0», for example a tautology and that F can be a formula that says nothing directly about «0» (in the sense for example that «0» does not occur in F).

The same reasoning applied equally to a definite description like «s0». The conclusion is that either «0» and «s0» are rigid designators (case of a categorical theory), or they are not (case of a non categorical theory such as AP). Therefore the distinction between proper names and definite descriptions cannot be made in terms of rigid designation and here again Kripke's theory is meaningless.⁶

In natural language, we can have a theory⁷ according to which «Brasilia» cannot denote the city of Washington, for example if we have statements in this theory such as «Washington is in the USA», «Brasilia is in Brazil», «USA and Brazil are different countries», etc.

If this theory has just one model, then «Brasilia» and «the capital of Brazil» are both rigid designators.

If this theory admits several models, then «Brasilia» will not denote the same objects in two different possible models, just because these models are different. A Kripkean could argue that this difference does not affect the identity of the city of Brasilia, but affects the reference of «the capital of Brazil». In fact Kripke's theory is based on this mysterious possibility which his opponents consider related to essentialism.

We don't know if essentialism can be a foundation for Kripke's theory. The problem indeed is to find something which can be a foundation for this mysterious possibility.

2. Singular terms in pseudo-formal set theory

21. Formal and pseudo-formal set theory

It is possible to eliminate any singular terms from the language of arithmetic LA .⁸ A formal philosopher who is convinced that natural language should work as a

⁶ I once heard a famous philosopher of language, explaining Kripke's theory, saying that a typical example of a rigid designator is a mathematical expression like « $\sqrt{2}$ ». First notice that « $\sqrt{2}$ » is a definite description rather than a proper name. Second, the reference of « $\sqrt{2}$ » can vary even when it is used by a mathematician who is not a logician and believes that he is working with categorical theories only.

⁷ There are various possible counterparts of formal (i.e. axiomatic) theories in natural language; a theory can be a knowledge database, information common to a community of people, etc.

⁸ In a language without the description operator terms can be eliminated by simulating individual constants with symbols of monadic predicates, and symbols of functions with symbols of relations. As regards the description operator, Russell himself

formal language could therefore argue that all these philosophical discussions about the distinction between proper name and definite descriptions, etc. are mere sophistry based on the confusions of natural language. His arguments would be similar to those people from Vienna who used to say that most traditional philosophy is the fruit of syntactic confusion. And like these people, he could say that the real work of philosophy is to point out those confusions and to stop the endless discussions arising from them, i.e. in the present time, discussions of philosophy of language, the «Metaphysics» of today.

However if one has a closer look at how mathematicians work including logicians such as set-theorists, he will see that the behaviour of their language is not so different from natural language and that perhaps it is the present logical formalization of mathematics, rather than natural language, which has to be transformed.

What happens in everyday mathematics is exactly the contrary of elimination of singular terms. Singular terms are introduced and they work in a way not so much different as they work in natural language.

There is a big gap between the formal and informal treatment of mathematical theories; this is clear for example in the case of number theory and its formal counterpart, Peano arithmetic.

An interesting case is the one of set theory where the gap is not so big. On the one hand we have formal set theory, on the other hand something that we can call *pseudo-formal* set theory.

In all books of set theory, the famous Weil's symbol « \emptyset » for the empty set is introduced. However in most books dealing with set theory as a formal theory and not only as a «naive» theory, this symbol is not properly introduced as a part of formal language. This is typical of pseudo-formal set theory. To turn this pseudo-formal theory completely formal, one has to consider set-theory with the operator of description and to define « \emptyset » in the language with a Leśniewski's style definition, for example:

$$\emptyset =_{\text{Def}} \iota x (\forall y (y \in x \rightarrow y \neq y))$$

In principle the formal language of set theory is extremely poor. There is only one symbol of binary relation « \in » and no singular terms. However a lot of singular terms besides « \emptyset » are introduced informally.⁹ Let us see how they works.

showed how it can be eliminated.

⁹ In principle it seems that there are no difficulties to turn pseudo-formal set theory into formal set theory. But a lot of things have to be checked. The operator of description is a *vbt* (variable binding term-forming operator) and one has to check that the usual syntax and semantics of first-order logic and the correlative results can be extended to *vbtos*. Such work has been carried out by Corcoran, Herring, Hatcher and da Costa. References can be found in (da Costa/Mortensen, 1983) which is a kind of survey.

22. « \aleph_0 » and « ω »: two proper names with different meanings but the same reference

Let us analyse the case of \aleph_0 and ω . They are in some sense two different proper names with the same denotation. Why to use two different names to refer to the same object? This seems against the idea that mathematics is a perfect science wishing to avoid ambiguity. In fact in mathematics, as in natural language, this practice is very common (as well as using the same name for different things).

We can say that « \aleph_0 » and « ω » are two different proper names that have the same reference but different meanings. We can say that their meanings are given by two co-designative definite descriptions, the first referring to the object as a cardinal and the second as an ordinal. They are two different ways to look at the same object.

If one should like to «fill the gap» between pseudo-formal set theory and formal set theory, he should introduce « ω » by definition:

$$\omega =_{\text{Def}} \iota x(Fx)$$

where F is a formula saying that ω is the first infinite ordinal. There are several equivalent ways to define ω . In fact any formula equivalent to F modulo ZFC does the job.

So what is the meaning of the proper name « ω »? If we consider that it is the class of all equivalent definite descriptions, then « \aleph_0 » and « ω » have the same meaning, and this does not fit with the idea of the mathematician who introduces two different names. If we consider that this is only a description, this seems too restrictive, because there are several ways to conceive ω as an ordinal (there are for example several equivalent definitions of the notion of ordinal).

Therefore the meaning of the proper name « ω » seems to be a certain intermediate class of co-designative logically equivalent definite descriptions. This view is close to Wittgenstein's analysis of the proper name «Moses» (cf. Wittgenstein, 1953, #79). The main difference concerns «logically equivalent». In natural language there is instead a notion of equivalence which is much fuzzier.

It is difficult to define rigorously this class for at least two reasons:

(a) If $\iota x(Fx)$ is part of the meaning of « ω », should we consider that so is $\iota x(Fx \wedge Fx)$?

(b) The meaning is something which changes according to the advances of mathematics, in particular proofs of new theorems. If one proves that F is equivalent in ZFC to an apparently very different formula G , then $\iota x(Gx)$ would become part of the meaning of « ω ».

23. What are the references of « \aleph_0 », « ω » and « \aleph_1 »?

We have said that « \aleph_0 » and « ω » have the same reference. What does it mean exactly? This means that in every given model of ZFC they denote the same object, and not that in two different models of ZFC they denote the same object. ZFC is not

categorical and « ω » and « \aleph_0 », as happens with «0» in the case of Peano Arithmetic, are not rigid designators in the sense that we have explained in section 13 above.

Let us consider the sentence:

DuPont wants to know if $\aleph_0 = \omega$.

Inspired by Frege, we can say that what DuPont wants to know is if « \aleph_0 » and « ω », which have different meanings, have the same denotation in any given model of *ZFC*. We can consider therefore that the true denotation of a proper name like « \aleph_0 » is the set of all its denotations in all models of *ZFC*. We will call such true denotation, its Denotation. Such a Denotation can be considered the set of all equivalent definite descriptions which define a given proper name. (Therefore this view does not necessarily commit one to Platonism or an ontology of abstract objects.)

Now if two proper names have not the same Denotation, there are two possibilities:

(a) they have different denotations in every given model of *ZFC*, as is the case for example as regards « \aleph_0 » and « \aleph_1 ».

(b) they have different denotations in some models of *ZFC* and the same denotation in some models of *ZFC*, case of « \aleph_1 » and « 2^{\aleph_0} ».

Accordingly the sentence:

DuPont wants to know if $\aleph_1 \neq 2^{\aleph_0}$.

can be interpreted in two different ways.

24. « \aleph_1 » and « 2^{\aleph_0} »: the interplay between meaning and reference

According to this view the Denotation of a proper name like « \aleph_1 » is something difficult to define or to catch, something one could say *inaccessible*. What the set-theorist is trying to do is to precise the meaning of « \aleph_1 », trying to compare it with other proper names like « 2^{\aleph_0} ». As we have said, for us, the meaning of a proper name is a set of definite descriptions. The meaning of « 2^{\aleph_0} » is relatively clear because among the set of definite descriptions corresponding to « 2^{\aleph_0} » there are several well intelligible entities, such as the cardinality of the set of reals, etc. But we know few things about « \aleph_1 », we know that it is the next infinite cardinal, but we don't know which kind of well-known sets have this cardinality.

To precise absolutely the meaning of a proper name like « \aleph_1 » would be to get its Denotation, which is something impossible. But one can get more information about it by identifying or differentiating it from another proper name (i.e. cluster of definite descriptions) like « 2^{\aleph_0} ». The set-theorist has an idea about « \aleph_1 » and his idea is not fixed, the meaning of « \aleph_1 » is changing, mainly by proofs of new results.

The reference of « \aleph_1 » considered its Denotation seems to be fixed and therefore one could claim that « \aleph_1 » is trivially a rigid designator. But in fact the reference of « \aleph_1 » can also changed, if we modify the axioms of set theory. Some people are looking for axioms from which it will be possible to prove the continuum hypothesis, i.e. according to which « \aleph_1 » would have the same Denotation as « 2^{\aleph_0} ».

3. Conclusion

It seems to us that proper names in natural language work in a similar way as proper names in pseudo-formal set theory:

- they are abbreviations of a cluster of a fuzzy changing set of co-designative definite descriptions;

- their meaning is the set (of meanings) of these definite descriptions and therefore is not stable (When the meaning of a proper name changes radically, the name may change accordingly and we have a new «baptism», both in mathematics and in natural language);

- their reference is the set of all equivalent definite descriptions, and may vary in function of the notion of equivalence, in function of the underlying theory, therefore proper names are not rigid designators.

A definite description is a particular case of a proper name, i.e. when the cluster is a singleton. The meaning of a definite expression is expressed by its structure and its Denotation is the set of possible interpretations of this structure. For example we can say that the Denotation of «The capital of Brazil» are the cities of Rio de Janeiro, Brasilia and Salvador at the times when they respectively were capitals of Brazil.

4. Bibliography

N.C.A. da Costa and C.Mortensen, «Notes on the theory of variable binding term operators», *History and Philosophy of Logic*, **4** (1983), pp.63-72.

A.Church, *Introduction to mathematical logic*, Princeton University Press, Princeton, 1956.

G.Frege, «Über Sinn und Bedeutung», *Zeitschrift für Philosophie und philosophische Kritik*, **100** (1892), pp.25-50.

S.Haack, *Philosophy of logics*, Cambridge University Press, Cambridge, 1978.

S. Kripke, *Naming and necessity*, Blackwell, Oxford, 1980.

L.Wittgenstein, *Philosophical investigations*, Blackwell, Oxford, 1953.

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Broadening and Deepening Yoes: The Theory of
Conditional Elements

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BROADENING AND DEEPENING YOES: THE THEORY OF CONDITIONAL ELEMENTS

Joseph S. Fulda

I. Yoes' Position

In a well-written, interesting paper,¹ Yoes takes the classical view of indicative conditionals — that they are truth-functional. He then deals with certain problematic cases of *if* statements by citing Russell to the effect that «grammar can hide logical form» and arguing that some *if* statements are simply not conditionals. To the question of which are and which are not, Yoes answers, somewhat satisfyingly, «Standard formal logic answers: when it satisfies Modus Ponens, Modus Tollens, etc. Some 'if's do not satisfy these formal properties, and therefore, according to this standard, are not conditionals at all. Thus do the formal properties define the conditional...»

The problem with this view, once mine, is that it is a self-affirming view of the truth-functionality of the conditional — a view that a non-classicist would say simply begs the question: Any putative counterexample to the classical view of the conditional can be written off with enough ingenuity in pragmatics as simply not a conditional. As succinctly stated by Yoes himself: «trained logical intuition sees a conditional behind every 'if'.» «Trained intuition» is oxymoronic, yet quite apt here, for *simple* intuition would surely lead to Yoes' conclusion or some such or, on the other hand, to the rejection of the truth-functionality of the conditional. With sufficient thought, however, one finds that every *if* statement, while not necessarily a conditional (\supset) has at least a conditional element (a notion to be elaborated on shortly) and we intend to show this by re-analyzing the examples from the literature Yoes cites with this in mind. In some cases, our refined view of *if* statements is even compatible with Yoes' particular sentential analyses — this article is put forward as a refinement of, not a reply to, Yoes.

¹ M. G. Yoes, «When Is If,» *Sorites* 1(April 1995): 96-99.

II. What Is a Conditional Element?

Simply put a conditional element is some part of, some central part of, the standard definition of the conditional, enough to justify the use of *if*. In an earlier paper² which sought to unravel the paradoxes of material implication — both the disturbing fact that all conditionals with false antecedents are true and the disturbing fact that conditionals with unrelated antecedents and consequents could be true — I explored alternative truth tables for the conditional that at least preserve the core meaning of implication — that $T \Rightarrow T \vdash T$ and that $T \Rightarrow F \vdash F$. This resulted in four species of \Rightarrow : \Rightarrow_1 , \Rightarrow_2 , \Rightarrow_3 , and \Rightarrow_4 , with truth tables as below:

P	Q	$P \Rightarrow_1 Q$	$P \Rightarrow_2 Q$	$P \Rightarrow_3 Q$	$P \Rightarrow_4 Q$
F	T	T	T	F	F
F	F	T	F	T	F
		Truth Table 1	Truth Table 2	Truth Table 3	Truth Table 4

Each of these captures some of the meaning of *if*, although \Rightarrow_1 alone is \supset , \Rightarrow_2 being just the consequent, Q , \Rightarrow_3 being the biconditional $P \Leftrightarrow Q$, and \Rightarrow_4 being conjunction, $P \wedge Q$. The thesis of that paper was that many of the problems attending material implication were the result of misreading biconditionals as simple conditionals, but as Yoes' cited examples show, misreading conjunctions or null-antecedent *ifs* as simple conditionals can also cause confusion.

It is also interesting to note that Yoes' condition for being a genuine conditional is met by each of these four variants of \Rightarrow : All satisfy, for example, both Modus Ponens and Modus Tollens. Thus, $P \wedge Q, P \vdash Q$ and $P \wedge Q, \neg Q \vdash \neg P$; likewise, $Q, P \vdash Q$ and $Q, \neg Q \vdash \neg P$; and, finally, $P \Leftrightarrow Q, P \vdash Q$ and $P \Leftrightarrow Q, \neg Q \vdash \neg P$.

Yet another way a conditional element can be present was discussed in two prior papers in this journal³ — universally general propositions are taken in predicate logic to be quantified conditionals. Quantified conditionals are not simple conditionals; they are normally best regarded as conjunctions of simple conditionals, but again the conditional element justifying the use of *if* is there: «If it looks like a duck, waddles like a duck, and quacks like a duck, then it is a duck» is an *if* statement properly transcribed as follows: $(\forall x)((Lx \wedge Wx \wedge Qx) \supset Dx)$.

² Joseph S. Fulda, «Material Implication Revisited,» *American Mathematical Monthly* 96 (March 1989): 247-250.

³ Joseph S. Fulda, «Denied Conditionals Are Not Negated Conditionals,» *Sorites* 2 (July 1995): 44-45; Joseph S. Fulda, «Counterfactuals Revisited,» *Sorites* 5 (May 1996): 35-38.

III. Re-analyzing the Problematic *If* Statements Yoes Cites

Before re-analyzing the problematic *if* statements Yoes cites, I wish to consider a clearer example of the same sort: «If you want to talk law, then your client doesn't even have standing to bring this suit at law.» Now Yoes would presumably read this as «You may want to talk law *and* your client doesn't have standing to bring this suit at law,» viz. as a conjunction with a modal. This is not *mistranslated*, but neither is it the best translation, although it is one that has a conditional element, \Rightarrow_4 . One reason it is not the best translation is because although the speaker clearly *believes* that the listener may want to talk law, there is no modal, express or implied, in what he *states*. Nothing in the language, that is, so much as *suggests* that an assertion is being made in the protasis. A better reading, therefore, is that the statement being made is simply the consequent: This, too, has a conditional element, \Rightarrow_2 . On this reading, the sentence affirms only the proposition «Your client doesn't even have standing to bring this suit at law» with the «antecedent» being simply a rhetorical flourish. I have no doubt that Yoes considered and rejected this alternative, because dismissing a clause as a mere rhetorical flourish is something no logician — at least no logician who believes in truth-functional semantics — can possibly be comfortable with. Better to posit a modal not textually supported (but consistent with the text) than to let the clause go entirely. Since, however, the rhetorical flourish is textually supported, I cannot agree.

However, this translation is also not the best; it is incomplete and exactly for the reason that Yoes might object to it altogether: It doesn't make full sense out of the antecedent. Even rhetorical flourishes have their syntax and there is no «if» without a corresponding «then.» On our (limited) account, the «then» does not correspond to the «if.» An extended account is therefore necessary. The sentence is elliptical and the best reading is «If you want to talk law, then let's talk law: Your client doesn't even have standing to bring this suit at law.» Suddenly, all the problems evaporate. Judged at the level of surface grammar, we have a level one conditional (which is probably optative and therefore not propositional — truth-functional), followed by a level zero atomic proposition. Judged as English, we have a rhetorical flourish which is incomplete as almost all of them are, followed by an assertion which is stated in full as is also the norm. Judged as a simple conditional, we resort — Yoes' way or my limited account — to the theory of conditional elements. Judged as a complex (layered) conditional, we have (so far) no need to do so here. (But the theory is needed anyway as exemplified by the material cited in n.2 and n.3.)

Without further ado, we take up Yoes' cases cited from the literature:

(1) If it rained, it did not rain hard.

Limited account: It did not rain hard.

Extended account: If it rained, it rained, but it did not rain hard.

(2) There are biscuits on the sideboard if you want one.

Limited account: There are biscuits on the sideboard.

Extended account: If you want a biscuit, I'll tell you where they are: There are biscuits on the sideboard.

Note that, especially for (1), the translation does not appear so readily to be multi-layered: «but» is normally «and» with a non-truth-functional twist, of course, and so we are back to Yoes. The statement as a whole may well be regarded as a conjunction, but not as a conjunction of a modal and the consequent but rather as a conjunction of a «conditional» rhetorical flourish and the «consequent.»

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Critical Comments on Laudan's Theory of Scientific
Aims

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CRITICAL COMMENTS ON LAUDAN'S THEORY OF SCIENTIFIC AIMS

Armando Cíntora

INTRODUCTION

Larry Laudan has proposed in *Science and Values* a meta-methodology of science which attempts to avoid historical relativism and a relativism of scientific methods by providing a rational justification for the factual, methodological, and axiological aspects of scientific change.¹ He argues that if relativism is to be avoided cognitive aims, theories and methods, should be capable of rational adjudication². Laudan argues that previous philosophers such as Popper, Carnap, Hempel and Reichenbach «opened themselves up to the relativist challenge», either because these philosophers considered the methods of science a matter of convention, or because like Reichenbach they thought that the aims of science are selected by 'volitional decisions', or because they thought –allegedly like Popper — that the only thing one could rationally ask of a set of cognitive aims is for this set to be internally consistent.³

Laudan tries to provide a rational account of the development of science through a reticulated model in which justification is multi-directional, and in which scientific theories, methods and aims change during the history of science.⁴ Temporarily accepted methods justify the theories of the day, and are justified by temporarily accepted aims. But these methods, in their turn, can also be changed by factual theories, while

¹ Laudan thus considers relativism as not desirable and hence he considers rationality as valuable. This is important to remember because his meta-methodology intends to be a naturalistic one. The question is whether the normative recommendations made by Laudan's theory are provided only by a descriptive or empirical study of the history of science, or whether the normative judgments made by Laudan's theory are instead the result of tacit evaluations.

² «What *does* give comfort to relativism is a failure to address the question: 'How are methodological rules or standards justified?」 (Laudan 1989, p. 370)

³ Cf., Laudan (1989), pp. 370-1

⁴ Cf., Laudan, 1996, p. 143

empirical theories and methodological rules also constrain the set of rationally possible cognitive aims. Hence there is a mutual and typically non-simultaneous adjustment and justification among factual theories, methods and ends. And none of these three levels constitutes an ultimate or even a favored or more solid ground.

Rationality is for Laudan about searching, and having good reasons, for believing one is following the most effective means for the attainment of certain ends that one has chosen. It follows, given this view of rationality, that the methodological rules of science are elliptical means-ends injunctions, ‘hypothetical imperatives’, of the form: *if you value, or desire ‘A’, then you should do ‘X’*. And since experience informs us which are the best means for our independently chosen ends, then methodological rules are fallible, corrigible and improvable via past or present experience. Since Laudan himself recognizes his methodological rules as hypothetical imperatives, if he is to avoid relativism, then he must tell us how to rationally select the desiderata in these conditionals’ antecedents, the cognitive aims ‘A.’ This because if the aims of science, the A’s, could not themselves be rationally selected, if any cognitive aim were as legitimate as any other, then these aims could legitimate any conceivable methodological rule, and ultimately these aims could legitimate any substantial theory, thus opening the gates to a radical cognitive relativism.

A ‘scientific’ creationist, for example, could propose as the central aim of science that of finding explanatory theories consistent with a literal reading of the Torah. And if this cognitive aim were to be scientifically legitimate scientists would have as central endeavours the search for, and elimination of, inconsistencies between scientific theories and the Biblical text, and scientists would search for an accurate translation and reading of the Torah. Creationism’s central aims and methods would disqualify contemporary geology, paleontology and evolution theory while legitimizing the Genesis account.

Laudan himself admits that his reticulated view needs to be supplemented by a theory of legitimate aims –an «axiology» as he himself calls it. And in *Science and Values* he has given some hints on how to develop such an axiology. I will explore Laudan’s suggestions on how to decide rationally between competing scientific aims, and whether these suggestions can avoid relativism.

LAUDAN’S THEORY OF AIMS

Laudan hinted in *Science and Values* — and in other more recent works⁵ — the view that our scientific aims can sometimes be rationally appraised by asking that they satisfy three constraints:

1) A pragmatic constraint of empirical realizability, or non-utopianism, this requisite is thought to follow from a means-ends perspective of rationality,

To adopt a goal with the feature that we can conceive of no actions that would be **apt to promote it**, or a goal whose realization we could not recognize even if we had achieved it, is surely a mark of **unreasonableness and irrationality**. (Laudan, 1981, p. 51) (Emphasis added)

⁵ Such as Chapter 8 of Laudan’s 1996.

Laudan believes that if one is means/ends rational then one cannot have 'utopian' aims, because utopian aims are of no help in selecting means. Laudan is hence allegedly only making a conditional recommendation against utopian aims (*if you will be rational, then avoid utopian aims*), though he is possibly really making an implicit categorical recommendation against utopian aims. This because in this last quote there is an implicit⁶ recommendation to be means/ends rational, and therefore there is also an implicit categorical recommendation to avoid utopian goals.

A goal, for Laudan, can be 'utopian' in three ways:

First, a goal is *demonstrably utopian* when

it **cannot possibly be achieved**, given our understanding of logic or the laws of nature... (Laudan, 1981, p. 52) (Emphasis added)

It would be utopian, for example, to aim in an infinite or immense cosmos, for certainty about empirical universal statements. And one way to find out whether some goals are achievable is to search the historical record to see if our goals have been, and therefore can be, achieved irrespective of whether they were consciously sought or were merely unintended consequences of some actions.

Second, a goal might be *semantically utopian*:

Many scientists espouse values or goals that, under critical challenge, they cannot characterize in a succinct and cogent way. They may be imprecise, ambiguous, or both. Such familiarly cited cognitive goals as simplicity and elegance often have this weakness, because most advocates of these goals can offer no coherent definition or characterization of them. (Laudan, 1981, p. 52)

Another example, might be *verstehen*, and epistemic coherence.

Third, a goal might be *epistemically utopian*:

It sometimes happens that an agent can give a perfectly clear definition of his goal state and that the goal is not demonstrably utopian, but that nonetheless its advocates cannot specify (and seem to be working with no implicit form of) a **criterion** for determining when the value is present or satisfied and when it is not. (Laudan, *ibidem*.) (Emphasis added)

Laudan thinks that truth, understood as correspondence, is an example of epistemic utopianism,⁷ therefore Laudan believes truth is an irrational goal. And this, even though, the search for explicative truth has been highly valued by many scientists⁸,

⁶ Since «unreasonableness» and «irrationality» are terms of abuse or opprobrium, there is an implicit recommendation in favor of being rational, also compare note # 1.

⁷ Cf., Laudan 1996, p. 78

⁸ Numerous scientists have highly valued and searched, at least *prima facie*, explicative truth. Garré of Basel, a disciple of R. Koch, for example, risked his health and life by inoculating himself with staphylococci, he did this to find out whether the hypothesis of a bacterial cause for anthrax was true.

and even though for truth we do have fallible criteria for determining when truth is absent, and even though, we also have fallible criteria — such as intersubjective consensus — for deciding when truth maybe present (or at least, we have fallible criteria for rational belief.)

Notice that there is an ambiguity in Laudan's last quote, since it is not clear what to understand by a 'criterion'. Is a criterion something everyone in a scientific community is to agree on? Must the criterion be infallible? Is it enough to have a criterion for determining when one approximates the goal, even if lacking a criterion for determining the attainment of the goal? Since Laudan thinks that truth is epistemically utopian it seems that for Laudan a criterion must be infallible or at least consensual.

2) *Laudan also asks scientific goals to be jointly consistent.*

3) *Laduan finally proposes as another constraint on scientific goals that these goals should be consistent with the 'Tradition', that is with the canonical achievements of a successful scientific discipline.*

Laudan's constraints of non utopianism and mutual consistency for scientific aims let in too much, that is, even if these constraints were to be sought and satisfied, one could still end with faulty scientific aims such as:

Look for theories in agreement with a literal reading of the Torah! Or, gather data at random! Or, seek false theories!

Laudan therefore further narrows the spectrum of possible cognitive aims by requiring that any proposal for new scientific aims must also be consistent with the scientific 'Tradition'. We are told that new aims or standards, if acceptable, must be able to capture, to redescribe, the canonical achievements of a successful scientific discipline. And the success of any scientific 'Tradition' is judged by some implicit pre-philosophical» pragmatic canons.

... any proposals about the aims of science must allow for the retention *as scientific* of **much** of the **exemplary work** currently and **properly** regarded as such. (Laudan, 1996, p. 158.) (Emphasis added)

We are being told that any proposals for scientific aims should retain as scientific «**much** of the **exemplary work**» of a scientific discipline. But how much is enough to retain? What of the 'exemplary work' must be retained, and what may be omitted? And why what Laudan and many of us think of as 'exemplary work' (say, the work of Newton, Maxwell, Einstein) is really exemplary?⁹ Laudan believes there are

⁹ If Laudan answers by proposing a selection of past scientific achievements as exemplary work, the norms would be there already in his selection. In other words, 'exemplary' is a normative term, and if one were to try to infer the standards of exemplariness from a selection of past scientific work, one would only obtain the standards that one put in, since to select the exemplary we must first assume some standards of exemplariness.

«pre-philosophical» pragmatic canons of scientific success¹⁰. These canons are cognitive goals such as prediction and control, and these canons judge what is scientifically *proper*, they judge what is scientifically successful. Still, if Laudan is to avoid relativism he should justify these standards of success.¹¹

ARE LAUDAN'S RECOMMENDED CONSTRAINTS FOR COGNITIVE AIMS ADEQUATE?

I will illustrate many of these criticisms with examples from non-cognitive ends.¹² Because we are often more acquainted with these other goals, and thus they provide a useful and clarifying analogy. There are analogies between cognitive aims such as the avoidance of *ad hoc* hypotheses, the search for verisimilar scientific theories, or to aim at simple or elegant scientific theories; and non-cognitive aims like the search for Buddhist Nirvana, the yearning for God, the 'pursuit of happiness'¹³, or goals such as wisdom, or love, in that all of these goals would be, according to Laudan, semantically and or epistemically utopian. While an aim such as perfect social justice is analogous to a cognitive aim such as complete truth in some field, or to full objectivity concerning some subject, in that all these aims cannot be achieved ('given our understanding of logic or the laws of nature') and so these goals would be, for Laudan, demonstrably utopian.

If it were to be argued that examples involving non-cognitive aims are misconceived because Laudan's theory is intended only for cognitive aims, then one would expect these critics to argue why analogies can't be drawn between these two types of aims. In other words, why would it be rational for a Laudanite to have utopian non-cognitive aims? The ball is in these putative critics court. It is hoped that the examples involving non-cognitive aims will have Laudan admit what he denies as rational in the case of cognitive aims. I argue that,

I. *Laudan's prescription for non demonstrably utopian aims is ambiguous*

An ambiguity becomes apparent when the first and second quotes in the last section are compared, while in the first of these quotes a utopian goal was characterized as one that could not be promoted by any actions, in the second quote a utopian aim was characterized as one that is impossible to achieve. A goal such as social justice or the whole truth about some discipline would not be utopian, according to the first characterization, since we rationally believe that we can come nearer them, that we can promote them. But by Laudan's second characterization social justice would be utopian, since given our understanding of human frailty it is *strictu sensu* unachievable.

¹⁰ Cf., Laudan 1996, pp. 148-9.

¹¹ Cf., note # 2 above.

¹² Many of the following arguments were inspired by various helpful conversations I held on these topics with John Worrall.

¹³ This aim is in the American Declaration of Independence.

This ambiguity about the nature of utopian goals may be the result of a confusion in what Laudan understands by means/ends rationality, in one place he says that a methodological rule is rational if it *promotes* some desired cognitive end(s), and in the next page he says that a rule is rational if following it is more likely than its alternatives to *produce* the desired end(s) (cf., Laudan 1987, pp. 24-6.) There seems then to be a confusion between promoting and producing some desired result. It seems that Laudan has conflated two different types of goals as ‘demonstrably utopian’:

- i) Valuable goals known to be both impossible to attain and to approach.
- ii) Valuable goals known to be impossible to attain, but yet known to be approachable or promotable.

I will concede to Laudan that valuable goals both impossible to attain and to approach (a rather uncommon kind of goal) may be irrational.¹⁴ While I will argue — *contra* Laudan — that valuable goals known to be impossible to attain, but still approachable (I will call this type of goals ideal goals) can be rational. To call ideal goals irrational is like asserting that if it is impossible to fully attain some valuable goal, then we should forsake this goal. This would be akin to a tantrum: ‘either I know I can fully get what I desire, or I don’t care about it.’

On the other hand, Laudan’s advice against demonstrably utopian goals may be cogent in a situation in which one has only one possibility: complete failure, without the possibility of partial failures, without intermediate options. In such a hypothetical situation if the valuable goal sought is known to be unreachable, and if this goal is also known to be unapproachable, it might then be rational to resign ourselves and look for another goal. Thus Laudan’s advice against complete truth in some scientific field would be cogent, for example, only if false scientific theories couldn’t have degrees of falsity or verisimilitude. In the case of many ideals, however, we don’t have such a radical situation, even if ideals are unachievable they can still be approximated. There are often intermediate states between not achieving the utopian goals at all, and fully achieving these goals.

Valuable ideals can be rational objectives if we understand means/ends rationality as the attitude of someone that searches for the warranted optimum means for the attainment **or approximation of his desired aims**. Means/ends rationality then only requires that our means be at least conducive to your aims, it does not require that the rational means actually deliver the aims. Means/ends rationality excludes

¹⁴ Doubts arise, even in this case, when we recall that Calvinists — as declared in the Synod of Dort — aspire to salvation, even though it might be impossible for them both to attain it and to promote it. This because they could be one of the unfortunates unknowingly predestined for damnation., and this regardless of their faith, love, or merit, or lack thereof. Calvinists live then in a permanent state of doubt and apprehension just hoping for the best. A similar situation may arise, when one applies inductive methods, methods that one cannot justify to one’s satisfaction — say, without circularity — in such a case, one uses induction without being committed to it. One proceeds hoping for the best and fully aware that one lives precariously.

impossible, but promotable aims as rational only if it is understood narrowly, as Laudan sometimes seems to do, only if means/ends rationality is understood as requiring that if rational we should look for strategies that **take us to our goals**.

Laudan's lack of discrimination between the previous two types of demonstrably utopian goals turns his injunction against demonstrably utopian aims into an 'imprecise' and 'vague' recommendation. Hence Laudan's injunction against demonstrably utopian goals is itself 'semantically utopian', and therefore Laudan's theory is self-referentially inconsistent.

II. Ideals cannot be dispensed with, because we don't know how far from an ideal is appropriate to aim.

Laudan may argue that while he excludes impossible goals as rational, he is not excluding as rational some achievable goal close to the the unattainable one. He may argue that many admired idealists supposedly striving after an impossible aim were really striving for more modest achievable goals. These idealists were really striving for goals close to, or analogous, to the impossible one. But this let out doesn't work: we try to reach impossible, but promotable valuable goals, because there is no cogent way of specifying in advance how close or how far from the unreachable goal is good enough. So one aims for the ideal itself, even if we are condemned — as Sisyphus — to always fall short of it. That is, we don't know how to weaken the ideal without it losing its appeal.

One may, for instance, struggle à la Socrates for self knowldege, even though the process of self discovery may never end. Yet we persist, because, we don't know how to weaken the ideal goal, without it losing its appeal or value. If not how much self knowledge would be good enough?

Other examples, are the search for self coherence, or the quest for a loving attitude. We don't know how much of these goals would be sufficient, we don't know how much would be appropriate, so we aim for the ideals themselves. One aims at the ideal because there is no acceptable weakening of the ideal, therefore it is rational to aim at valuable ideals.

III. Laudan's recommendation against ideal aims is in fact a prescription for intellectual and moral complacency, for mediocrity, and for conservatism.

Laudan's recommendation against impossible but approachable valuable aims (that is against ideal aims) discourages us from aspiring after excellence, cognitive or otherwise. Laudan's recommendation is contrary to a traditional virtue: courage, a virtue necessary to lead a good life. Laudan's advice substitutes courage by conformism and stoic resignation. Laudan's ambiguous theory would imply that a Soviet dissident¹⁵ who struggled for political freedom in the 50's was irrational, since this dissident knew that his goal was practically impossible to attain. And this was precisely the opinion of Soviet psychiatrists, who considered these dissidents as insane. These dissidents were thought to be insane, because they would not adapt or conform,

¹⁵ Cf., J. Elster, Chap. 1.

because they were maladapted, as was shown by their stubborn and hopeless contest, they were maladapted as was shown by the enormous personal costs they were ready to incur for the sake of their impossible dream: ‘bourgeois freedom’. Still these dissidents persisted in trying to promote, to approximate, the impossible goal. For Laudan a conformist or resigned slave would be rational, but a frustrated idealist who would not conform would not be rational.

Laudan seems to have confused success, expediency, with the struggle to do the right or correct thing. For Laudan, success understood as the attainment of attainable goals is the ultimate goal. Success is Laudan’s idol. But success cannot be the ultimate standard, it cannot be the ultimate value, because we can always ask: is the success sought (i. e., the attainment of the attainable goal) right? Is the success sought just? Is the success sought worthwhile? Is the success sought desirable or valuable? For example, if the aim sought is knowledge, we often think of it as undesirable, if to achieve it, human or animal suffering is required. This is shown by the restrictions on human medical experimentation, and by the ongoing debate on animal experimentation.

Also pyrrhic victories, and unjust victories (in the case of these last as shown by the ongoing debate on just war) are often thought undesirable. And we may even value a defeat, an example is provided by the battle of Kosovo that Serbs — and their Hungarian and Albanian allies — lost in 1389. Still this defeat has been hallowed by Serbs for centuries «in several great heroic ballads»¹⁶ possibly because it is believed that some ideal value was sought or defended, say, liberty, or honor. Analogously we sometimes also value failed past theories (failures as judged by Laudan’s pragmatic canons of scientific success) because these theories suggested new perspectives or problems, possible examples of such theories are those of Aristarchus and of ancient Atomism.

IV. Idealists aiming for valuable and strictly impossible goals have been praised by legions, and these idealists have been admired precisely because of their idealism. Laudan’s disqualification of ideal aims is counter-intuitive, since it contradicts these widespread value intuitions.

Laudan says,

We **customarily** regard as bizarre, if not pathological, those who earnestly set out to do what we have very strong reasons for believing to be **impossible**. (Laudan, 1981, p. 51) (Emphasis added)

Perhaps we customarily judge thus, when considering common goals, but one is not governed by customary judgments, when assessing extraordinary cases. Thus, the epithets of ‘bizarre’, ‘pathological’, or ‘unreasonable’, are frequently withheld if the

¹⁶ «the Serbs and their allies suffered a defeat that has become hallowed in several great heroic ballads. (...) They have become lenses through which subsequent creators of national mythology have come to see their past, endow it with deep metaphysical import, and imagine the attributes of the nation in essentially spiritual terms. Kosovo was turned (especially during the 19th century) into the Jerusalem of the Serbs.» History of Serbia, Encyclopaedia Britannica CD 99 Multimedia.

impossible but promotable aim sought is considered to be extremely valuable. In such a case the subject (or generations of subjects) who struggle, or who is thought to struggle, after ideal aims won't be called mad or bizarre, but will instead be considered an idealist, a hero, a martyr, a courageous man, or a saint.

The revered individual has through history often been the tragic idealist who aims at impossible, but promotable goals, even if this idealist has to take arms against a sea of troubles, and even if during his lifetime he cannot prevail. A well known example of idealist conduct is provided by the standard reading of Socrates' conduct after his trial. Socrates chose to stay in Athens even after the death penalty had been pronounced against him. Socrates didn't flee (which he could have done) because he allegedly thought that the correct thing to do, was to be self-coherent, to be true to himself, to be true to his sense of justice, and to obey his city's laws¹⁷. Now, full personal and intellectual integrity is an impossible aim because of human frailty, and because its full attainment would require of full self knowledge, its full attainment would require of no self-deception, of no inner hypocrisy. Still Socrates had it as an aim, and he was ready to sacrifice his life for this aim. Would we call Socrates irrational by aiming at this end?¹⁸

Laudan may likewise say that all those Christians that have aspired to be like Christ, and have aimed at a **perfect** Christian life are irrational, qua religious persona. An example of such a Christian would be St. Francis, Laudan may disqualify Francis as irrational¹⁹ because to strive towards perfection is irrational. It is irrational because we cannot expect human perfection. Still the Church enjoins its adherents to seek Christian perfection, for example it advises its faithful to struggle for the ideal of Christian marriage.

Someone may argue that all the previous examples of 'idealists' are wrong, because all the individuals mentioned were not genuine idealists. He could argue that all of these individuals were not really striving after utopian aims, but were rather trying to satisfy their vanity, or were looking for power, or for some other non-utopian

¹⁷ Cf., Plato's *Crito*.

¹⁸ Oscar Wilde, at the Cadogan Hotel in 1895, after his failed action against Lord Queensberry, rejected — as Socrates had — the achievable option of flight to await inevitable arrest. Wilde may appear in this act, to be self-destructive and irrational, however, in another reading of this event, Wilde's act shows him to have been determined not to yield to the pressures of a hypocritical society. Wilde stayed in England, and did forced labor, because at the Cadogan Hotel, Wilde decided to search an ideal, the ideal of self and social consistency, the ideal of self and social authenticity. Wilde stayed because he wanted to fight hypocrisy, and he was ready to suffer forced labour for the sake of this goal. A goal — that given what we know of human nature — is an impossible goal, and it is a goal that can only be approached.

¹⁹ Francis' goal may also be irrational for Laudan, because it is also possibly both semantically vague, and epistemically utopian.

goal. But, even if this were the case, these individuals have been admired because they have been believed to have been idealists. In other words the argument here only needs to assume that idealist behaviour has been widely held to be admirable²⁰. This common esteem for idealist behaviour appears to contradict Laudan's epithet of «irrational» or «pathological» for idealist conduct, and this even if we were to grant that idealist conduct has never been genuinely exemplified by anyone.

A philosophy that disqualifies as irrational widely admired or revered goals, as well as their admirers, is under suspicion of having too exacting standards. Laudan's proscription of ideals as irrational contradicts what we know about common human valuations and behaviour. It contradicts what we know about the behaviour of the admired idealists, as well as what we know about the behaviour of the admirers of these idealists. Then Laudan's advice against utopian aims is itself under suspicion of being 'demonstrably utopian', because it contradicts our understanding of some laws of nature, in this case, those laws relating to the behaviour and valuations of a significant segment of humanity. If so Laudan's meta-methodology is under suspicion of being precisely what it condemns, and then Laudan's anti-utopianism is itself suspect of being self referentially contradictory.

If not, consider the following set of three theses:

i) With Laudan sustain that idealist behaviour is irrational, ii) Notice that in our culture 'irrational' is a term with derogatory implications of foolishness or madness, and iii) Consider the empirical fact that there have been idealists aiming at valuable goals throughout history,²¹ and that many of these idealists have been widely admired *qua* idealists. This set appears to be incoherent, since from (i) and (ii) one concludes that idealists are foolish, or crazy, and this conclusion clearly clashes with (iii). One could try to escape this incoherence through one of the following options:

- a) Conclude that the term 'irrational' whatever our *de facto* social use says is not a term of disapproval or abuse. But to conclude this, one would have to ignore an empirical fact.
- b) Assert that idealists searching valuable ideals — whatever their numerous admirers have said — are not admirable *qua* idealists. But it is counterintuitive to say, for example, that Socrates search for intellectual and personal integrity was «bizarre» or «pathological.»
- c) Conclude that the search for very valuable, strictly unattainable, but promotable goals is not irrational. Since a world without such utopian goals would be for many an impoverished world, and if such utopian

²⁰ It could still be argued that the numerous people that have admired idealist conduct, have been the victims of self-deception, that they have really admired something else, but what could this something else be? Besides, the hypothesis of self-deception would require of a colossal amount of self-deception, or false consciousness, which appears as an implausible thesis.

²¹ Or at least people widely believed to have been idealists.

goals were irrational, then full rationality wouldn't be desirable for these many.

Still this argument is somewhat weak. We only know that the set of thesis (i)-(iii) is incoherent, but logic does not tell us which of these thesis to give up. In the following two sections, I will give some further arguments for taking option (c). These arguments taken in isolation are not conclusive, but the sum of all of them may have some weight.

V. *The fact that ideals are humanly impossible to attain, and that one can only approach ideals, provides paradoxically a powerful psychological reason for striving after valuable ideals; striving after valuable ideals can also create an enduring emotion of self-respect.*

Open ended valuable goals can be more fulfilling, because they permit us to move forward, because there is no end to our endeavour after them. This because the journey can often be more fulfilling than reaching the destination.

The idealist aims for ideals because he wants to keep on improving his accomplishments, because he believes in the perfectibility of life on earth, the ideals help him in avoiding selfcomplacency. The ideals provide aspirational goals, regulative ideas, which guide the idealist's imagination, which guide his hopes and energies, even if he cannot expect to ever fully achieve his ideals. In the case of the search after non-utopian goals one often experiences a letdown, if one achieves them, what else is there?²² It is continued hoping and continued striving that propel a person through life, this psychological fact, supplies one reason for aiming at ideals.

Furthermore a life's struggle after ideals can cause — at least in certain temperaments — lasting emotions of self respect or self-esteem, and these emotions are necessary for a good life²³. Therefore it may be rational — at least for these temperaments — to strive for ideals and their **concurrent** emotions. Consider, for instance, the case of an idealist such as that of the 5th century Syrian anchorite St Simeon *Stylites-the Elder*, who lived on top of a tall column for decades (permanently at the mercy of the elements, almost never descending to the ground, and then very briefly) looking for salvation, searching spiritual enlightenment. From Laudan's perspective his fakirsh conduct appears as irrational, but if one takes into account Simeon's situation, i. e., the background beliefs and valuations of St Simeon *and his*

²² This psychological fact may be exemplified by a phenomenon such as that of the idealized and valued Medieval 'courtly love'. This love was a longing that lasted as long as it was not physically satisfied, and therefore the lovers avoided consummating their love.

²³ For Rawls (cf., Section 67) self respect is one of the primary goods, that is, one of the goods necessary for the framing and successful execution of a rational plan of life.

society, one then discovers that his ascetic plan of life was considered praiseworthy²⁴ and thus it helped provide Simeon with enduring self, and social esteem.²⁵ And these emotions of esteem could arise **only if both** Simeon and his contemporaries believed — perhaps wrongly — that Simeon was really aiming at some valuable transcendental goals, and not just, for example, at status, fame or prestige.

What his contemporaries probably admired in Simeon was his heroic effort to do what was considered right, that is, they probably admired his heroic effort after the ideal of self coherence. Simeon's contemporaries probably admired his struggle to be true to his own values and principles (values and principles which were also those of most of his Byzantine contemporaries), that is, they probably admired his *enkrateia*.

The search of ideals can likewise provide whole communities with generalized emotions of self-respect. This fact has been known and exploited, for example, by army leaders who take care to motivate future combatants by arguing to them that the war they are to engage in is a just war, a war that aims at ideals, such as democracy, justice, freedom, honor, glory, etc. An army that believes that it is fighting for ideals is a motivated army, and therefore such a collective belief increases the likelihood of its heroic behaviour. In the case of scientific communities one may speculate that those scientific communities that aim (or believe to aim) at ideals such as truth gain in self respect, and therefore such communities also gain in motivation.

In Laudan's tripartite reticulated model of substantial theories, methodological rules and goals, emotions have been left out, possibly because we ignore so much about the nature of emotions and about their possible rationality. But as the previous example suggests, a complete theory of human action, and in particular of scientific behaviour, would need to take emotions into account. The rationality of aims needs to take into consideration their coherence with other goals (cognitive, moral, practical), and it needs to take into consideration the coherence of aims with substantial theories, as well as their coherence with methods, but it also should take into account the coherence of aims and emotions.

VI. *Laudan's prescription against 'semantically' and 'epistemically' utopian aims is inadequate, because it often happens that one doesn't know, at least consciously, what one is aiming at, and still one can approach obscure goals by the 'via negativa'.*

One can aim at a goal as a sleepwalker, many have tried to reach fuzzy ideals even if they had to strive half in the dark. For instance, when one longs for somebody,

²⁴ As shown by the fact that Simeon was visited at his column by many pilgrims, by the fact that Simeon became a role model for many who were still emulating him as late as the XIXth century, and by the fact that his advice was even sought by the Imperial Court.

²⁵ Rawls says that, *finding our person and deeds appreciated and confirmed by others who are likewise esteemed and their association enjoyed*, helps us to gain self-esteem.

it often happens that one doesn't really know what it is that one desires. It is easy to confuse a longing for love, beauty, knowledge, or companionship with sexual desire. Thus, a personal relationship could start as a result of the search for fulfillment of a supposed erotic desire, just to discover that this desire is only an aspect of what we are really looking for. One discovers that the original longing was for something more than sex. What precisely that *more* is, it is something we cannot clearly express, it is a *je ne sais quoi*. It could be a desire to know and to love that person, or it could be a desire for beauty, or for immortality, transcendence, or for self knowledge.²⁶

Rimbaud describes such a search in his dreamlike poem «Le Bateau ivre» where he describes the journey of a seer in a tipsy boat, and where the seer is on a search for some unnamed ideal that he seems to only glimpse. Luis Buñuel has also portrayed such a situation in his *Cet obscur objet du désir*.

Such ends, due to their obscurity, are likely to be semantically and epistemically utopian, that is, these goals cannot be characterized in a 'succinct and cogent way', and/or we don't have a 'criterion' for determining when we have reached them. Hence, Laudan would disqualify aiming at them as irrational, but one can approach an ideal without having a clear idea of what it is, by struggling to eliminate what it is not, by a *via negativa à la Popper*, a *via* that is as fallible as any other strategy. Thus one hopes to promote obscure goals such as wisdom or verisimilitude by striving, in the first case, against cases of foolishness, or in the second case, by eliminating error. And one follows the *via negativa* **only because** one values, only because one desires the obscure positive ideals.

VII. *Laudan does not justify as valuable his pragmatic canons of scientific success, and therefore relativism threatens.*

Laudan told us that scientific aims ought to be consistent with the scientific Tradition. And Laudan's pre-philosophical pragmatic canons of scientific success distinguish the success of science — the scientific Tradition — from that of other disciplines, also with a tradition, such as for example philosophy or theology.

Laudan's pragmatic canons provide a *de facto* demarcation criterion between successful science and other cognitive endeavors, and this demarcation criterion has the character of an intuition, since Laudan told us that his pragmatic canons are «prephilosophical» notions:

Scientists' judgments as to the **success of a scientific** practice depend not on abstract epistemological and methodological matters but on palpably *pragmatic* ones (...) Thus, a medical practice is successful or not depending to the degree to which it gives its initiates the ability to **predict** and to **alter** the course of common diseases. An astronomical practice is successful to the extent that it enables one to **anticipate future positions** of planetary and celestial bodies.

... If my suggestion that there must be a **prephilosophical notion** of empirical success — which is not itself beholden to controverted epistemic or methodological doctrines — seems controversial, we might ask how it could be otherwise. (Laudan, 1996, pp. 148-9.) (Emphasis added)

²⁶ Cf., Diotima's discourse in Plato's *Symposium*.

This notwithstanding Laudan's rejection of intuitionism,

... we will have no need for our '**pre-analytic intuitions**' about concrete cases, or for value profiles of the 'scientific elite', **or for any other form of intuitionism** about concrete cases. (...)The naturalistic metamethodologist, as I have described him, needs no **pre-analytic intuitions about cases**, ..., and **no prior assumptions about which disciplines are 'scientific' and which are not**. (Laudan, 1996, pp. 137-8.) (Emphasis added)

Laudan seems to be saying,

if you are to be rational, and if you want to do successful science, then you should not ignore the pre-philosophical pragmatic canons of empirical success.

There is in this conditional an implicit prescription in favor of the pragmatic canons, since Laudan would not call someone who would ignore his pragmatic canons, while wanting to do science, fully rational, and rational is for Laudan a term of praise (cf., notes # 1 & 6.) The question now arises of how to justify Laudan's conditional norm.

If one rejects, as Laudan has done, justification in terms of intuition, convention or stipulation²⁷, then we may look for an empirical justification. And this is precisely what Laudan tries to do, he believes that as a matter of fact, or as a matter of historical description, the successful sciences satisfy his pragmatic canons, and that therefore the previous conditional follows. But why aren't theology, philosophy, musicology, scientology, creation science, or even magic, and demonology, taken as examples of *bona fide* scientific disciplines, as examples of successful sciences? Why aren't the canons of these other activities prescribed to whoever wants to do successful science?

It appears that empirical prediction and control have been taken as canons of scientific success, because allegedly they happen to be the implicit standards of disciplines considered as successful science. Laudan has selected some disciplines as examples of successful science, because they fulfill his preconceptions or intuitions (intuitions which are also ours) of successful science. And then of course, it is a fact that the disciplines so chosen exemplify his pre-philosophical canons of successful science. We are then left with pre-analytic canons which are merely declared as idiosyncratic of successful science. We are then left with canons that are dogmatically asserted as those of scientific success.

The situation is analogous to that of someone who would say: *if you want to be just, do as St Francis!* And if we ask why do as St Francis? Then we would be answered, *because the just, as a matter of fact, behave as St Francis*. The question then arises, which standards were used to select the just? and, why weren't Hitler, Prince Dracula, or Francisco Pizarro selected as one of the just?

²⁷ Laudan has criticized Popper for his conventionalism about scientific aims and methods, and Laudan has criticized Lakatos for his intuitionism. Cf., Laudan (1996), pp., 15 — 16, and Laudan (1986) respectively.

The answer may be that some individuals were selected as just, because their conduct is consistent with widely held «pre-philosophical» preconceptions or intuitions of justice (though these 'pre-philosophical' preconceptions of justice are not shared by all, for example not by Hitler.) And then, of course, it is a fact that the chosen individuals exemplify our pre-philosophical canons of justice. The problem is now to justify as correct the preconceptions or intuitions that helped to select the allegedly just individuals. If this petition of justification is not satisfied, then we could rightly conclude that it has merely been dogmatically asserted that St Francis conduct was just²⁸.

But then relativism threatens because if Laudan's pragmatic standards have to be taken for granted, if they have the logical character of dogma, then the logical possibility arises of a Babel of different dogmatic canons. The creationist, for example, could reject Laudan's canons and invoke other standards, standards which the creationist could rightly argue are not irrational but only different from Laudan's.

Laudan may argue that to ask for justification all the way down to the 'bedrock' is unreasonable, that it is unreasonable because bedrock justifications cannot be provided. Laudan may argue that to aim at such ultimate justification is a 'demonstrably utopian' aim²⁹, and therefore an irrational aim. Still, Laudan himself has told us that what gives comfort to relativism is the lack of justification of methodological rules and standards (cf., footnote 2, above.) And Laudan's pragmatic canons are *de facto* scientific aims or standards, though of a very general character since they apply to all scientific disciplines. For example, to abide by the canon of scientific predictivity is the same as to set prediction as a goal that must be fulfilled by all scientific theories. This becomes specially clear when one notices that these canons «*serve as certifier or de-certifier for new proposals about the aims of science*»³⁰, so these canons are the supreme scientific aims, the aims that judge any other scientific aims. And if we are to accept Laudan's directive on how to beat relativism, we must then try to justify these canons. And since this justification is, and it appears that it will be unavaliable, then one must conclude that relativism — as characterized by Laudan — is unbeatable³¹. To beat this relativist threat Laudan would require of a criterion of rationality by which to judge his prephilosophical canons. And then Laudan should try at least to explicate — if not to justify — this prior criterion of rationality. But both explication and justification are missing.

²⁸ A similar argument has been developed by J. Worrall, 1996, p. 8

²⁹ It is a 'demonstrably utopian' aim, because if we understand proper justification (as Laudan does) as an argument in favor of a statement, method, or goal, then logic tells us that the search of justification must lead to an infinite regress, circularity or dogmatism, this because every argument has premises.

³⁰ Laudan, 1990b, p. 53.

³¹ Or as John Worrall has argued: 'relativism as Laudan defines it, is inevitable' (Worrall, 1989, p. 381.)

Notice also that Laudan's pragmatic canons are *de facto* ahistorical and universal basic scientific aims, because these canons judge the success of **any** scientific Tradition, these canons judge the success of traditions as dissimilar as those of medicine and astronomy. The fixed and universal character of these canons contradicts, however, Laudan's thesis that the aims of science have changed.

The view of science now emerging in some quarters (including my own) is **Heraclitean through and through**, insisting that science — diachronically viewed — changes its content, its methods, and its aims from time to time. (Laudan, 1996, p. 143) (Emphasis added)

VIII. *Even if we grant to Laudan, without justification, that his pragmatic canons of scientific success are valuable scientific aims, he also needs to assume without justification that his canons are 'primus inter pares' amongst valuable scientific goals.*

Laudan prescribes that scientific goals — amongst these one would expect to find his pragmatic canons of scientific success — should be jointly consistent. Mutual goal consistency, however, is not a trivial matter, because our aims are not always completely independent, and acting to fulfill some aims may make it difficult or impossible to achieve others. Because of this situation a rational life does not consist of a series of successive actions, each one directed at satisfying one or another of our goals.

And it also follows that full individual human realization is an impossibility, because our different valuable aims have to be somehow negotiated or sacrificed so as to be made complementary, so as to be accommodated in a coherent whole.

There can be, for example, tensions between cognitive aims such as, explanatory power and conceptual simplicity, or between explanation and empirical adequacy, or between clarity and brevity, or between description and explanation, or between accuracy and explanatory scope, or between conceptual simplicity and systemic coherence.³² And there are also incompatibilities between many of these cognitive aims with other type of goals, such as social usefulness, psychological well being, and with moral values. This last case has been exploited by fiction writers with the character of the 'mad scientist' or technologist such as Dr. Frankenstein. Examples of every day life contradictory aims, or of aims that are at least partially incompatible, are:

The tensions between social egalitarianism and individual freedom³³.

The incompatibilities between preservation of life and quality of life, as illustrated by the axiological debates around abortion and euthanasia.

The inconsistencies between economic growth and standard of life, and a healthy ecosystem.

The inconsistencies between full employment and no-inflation in a market economy.

³² Cf., chap. XIII of Kuhn's *The Essential Tension*.

³³ This example of incompatible aims was argued at length by I. Berlin, cf., p. 12.

The tensions between individual freedoms and community values, for example, the case of individual private property vs communal property.

The tensions between freedom of speech, and the preservation of life and physical and moral integrity, as exemplified by the axiological debates about child and sado-masochistic pornography.

Tensions between goals can lead, when unsolved to a Buridan's ass's situation. Hence it is necessary to know how to prioritize, weight or reinterpret aims, so as to combine them in a new consistent synthesis³⁴. Axiological debates often merely have to do with diverse ways of weighting ends or values, and not with the selection of the set of valuable aims itself. For example, assume two XVIth century astronomers share the same cognitive values, and share the same value hierarchy, except that the first astronomer gives more weight to conceptual simplicity, while the second one gives a higher rank to inter-theoretical coherence. If so, our first astronomer would prefer the Copernican system, because of its conceptual simplicity, while the second scientist would side with the geocentric system, because of its coherence with Aristotelian physics and cosmology.³⁵ Or another example, a British Laborite, allegedly, gives more weight to social justice than a Tory, though both might share the same list of liberal values.

There are many possible value hierarchies all of them allowed by reason, because to weigh aims we need to order them in terms of relevance, centrality, importance, or pertinence. And these last criteria are themselves values, rather meta-values, meta-values that can be different for diverse communities, scientists, and times. If one tries to justify as valuable some of these meta-values, and if one excludes as Laudan would like to do justification by convention or intuition, it seems one will end with Sextus trilemma: or infinite regress, or an argumentative circle, or dogmatism.³⁶ And if the regress is to be avoided, and if one is looking for a non-circular justification, then we are only left with dogmatism. Therefore axiological inconsistencies will have to be dealt with different prejudices about what is important or relevant. Then the harmonization of aims is a question to be decided by biographical or historical accident,

³⁴ The weighing of ends is also needed to fine tune the means chosen to approach or attain some aims, since the means are often underdetermined by the desired end states. For example, if the only aim of a community were egalitarianism the way it was approached (say through revolutionary terror or through gradualist reform) would be irrelevant. Other weighted aims are needed, such as human rights and democratic freedoms, to help narrow the underdetermination of chosen means. If not one could end with results as dissimilar as Maoist China and the Japan of the 60's, two communities which were allegedly quite egalitarian.

³⁵ Cf., chap. XIII of Kuhn's *The Essential Tension*.

³⁶ Cf., note # 30.

not by reason³⁷. This means that even if different rational communities were to share the same values, they still could have different value hierarchies. And none of these value hierarchies can be shown to be rationally better than any other, except, from their own meta-perspective. One has to choose between hierarchies without the help of reason, because reason cannot determine which hierarchy is to be preferred.

The resulting pluralism of value hierarchies implies that there are many possible rational plans of life,³⁸ or many possible rational scientific conducts. The awareness of this axiological fact may be an antidote against the danger of fanaticism, a danger to which the search for ideals can lead.

But if a pluralism of value hierarchies is to be innocuous, if it is not going to become a relativism where anything goes, it must give priority to some aims, so as to confine the universe of value hierarchies to those acceptable. For example, in the case of contemporary liberal democracies the pluralism of life styles allowed by these societies is far from being full relativism, since contemporary democratic liberalism is restricted by the priority given to values such as human rights, democracy and tolerance.

While if a pluralism of scientific value hierarchies is to be innocuous, it would have to be restricted by postulating that some scientific goals should have priority in all acceptable scientific value hierarchizations. For Laudan the goals *primus inter pares* are likely to be his pragmatic canons. Laudan needs scientists *qua* scientists to value his canons, but Laudan also needs scientists to give his canons priority over other cognitive desiderata. Because if these canons were to be given a low weight, and if one were to emphasize in their instead — say — audacious speculation plus theoretical beauty, then one may end doing something closer to contemporary French philosophy than to empirical science.

But how to justify Laudan's prioritization of his canons? Laudan has not told us how to weigh, prioritize or re-interpret incompatible but attractive cognitive aims, thus his injunction for aim consistency — even if inconsistency were clearly established³⁹ — is incomplete. And Laudan's theory of values is incomplete, because it may not be completed by reason. If so, Laudan's prioritization of his canons has to be taken for granted, it has a dogmatic character, in the sense that it can not be rationally justified as correct.

³⁷ Cf., N. Rescher, *The Strife of Systems*, chapters 7 & 8.

³⁸ To narrow the range of possible rational life plans Rawls introduces the 'Aristotelian Principle', a principle that supposedly states a natural fact, and that says: other things equal, human beings enjoy the exercise of their realized capacities (their innate or trained abilities), and this enjoyment increases the more the capacity is realized, or the greater its complexity. (Rawls, p. 426.)

³⁹ Since some axiological inconsistencies can be only pragmatic, it is not always clear whether some collection of ideals is mutually inconsistent.

Conclusion

It has been argued that Laudan's theory of values is inadequate:

a) Because Laudan's theory has problems of self referential inconsistency. Thus, Laudan's theory is 'semantically utopian' since it does not distinguish impossible-unapproachable aims from merely impossible aims. And it is suspect of it itself being 'demonstrably utopian' when it proscribes idealism as irrational.

b) Because it is rational to aim at valuable ideals since there is no cogent way of specifying in advance how close or how far from the valuable ideal is good enough. So ideals cannot be dispensed with.

c) Because it sacrifices ideals for the sake of expediency, in particular this perspective considers valuable ideals as irrational, and this conflicts with widespread positive intuitive valuations of valuable ideals.

d) And it was argued that to aim for desirable ideals could be shown to be rational, if due consideration is given to the emotion of self-esteem of those that aim at ideals.

e) Laudan's proscription of 'semantically utopian' and 'epistemically utopian' goals, is too restrictive, because one can pursue an aim obscure to the conscious mind. And still try to approach the goal by a *via negativa*.

e) Finally it was argued that Laudan's theory could not beat relativism. Because,

i) Laudan does not justify as valuable his 'pragmatic canons', and these canons have to be accepted without a non-circular justification.

ii) Laudan neither justifies his prioritization of his pragmatic canons, a prioritization that therefore also has a dogmatic character.

REFERENCES

- Berlin, I. (1990) *The Crooked Timber of Humanity*, Edit. H. Hardy, (Princeton University Press) New York.
- Elster, Jon (1989) *Salomonic Judgements*, (Cambridge University Press) England.
- Kuhn, S. Th. (1977) *The Essential Tension*, (The University of Chicago) Chicago, Ill.
- Laudan, L. (1981) *Science and Values*, (University of California Press) Berkeley, Cal.
- Laudan, L. (1986) «Some Problems Facing Intuitionistic Meta-Methodologies,» *Synthese* 67, 115-29.
- Laudan, L. (1987) «Progress or rationality? The Prospects for Normative Naturalism,» *Am. Phil. Q.* 24, # 1, pp. 19-31.
- Laudan, L. (1989) «If It Ain't Broke, Don't Fix It» *Brit. J. Phil. Sci.* 40, 369-375. Great Britain.
- Laudan, L. (1990) «Aim-Less Epistemology?» *Stud. Hist. Phil. Sci.*, 21, # 2, 315-322.
- Laudan, L. (1990b) «Normative Naturalism» *Phil.Sci.*, 57, pp. 44-59.

Laudan, L. (1996) *Beyond Positivism and Relativism*. (Westview Press) USA.

Rawls, J. (1972) *A Theory of Justice* (Oxford University Press) UK, 1973.

Rescher, N. (1985) *The Strife of Systems. An essay on the Grounds and Implications of Philosophical Diversity*. (University of Pittsburgh) USA.

Worrall, J. (1988) «The Value of a Fixed Methodology,» *Brit. J. Phil. Sci.* 39, 263-275. Great Britain.

Worrall, J. (1989) «Fix it and be Damned: A Reply to Laudan,» *Brit. J. Phil. Sci.* 40, 376-388. Great Britain.

Worrall, J. (1996) «Two cheers for ‘naturalised philosophy of science’,» unpublished lecture.

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Complementary properties and persisting objects:
ontological constraints on the semantics of sentences
of the type 'O is ϕ at t'

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COMPLEMENTARY PROPERTIES AND PERSISTING OBJECTS: ONTOLOGICAL CONSTRAINTS ON THE SEMANTICS OF SENTENCES OF THE TYPE 'O IS ϕ AT T'

Montse Bordes

Even the most Parmenidean-minded of people recognize that quotidian objects somehow undergo change. This claim, nonetheless, is as clearly intuitive as it is apparently incompatible with one of our most widely believed logical principles, namely, Leibniz's Law. My aim in this paper is to focus briefly on the metaphysical issue underlying this alleged incompatibility in order to provide elements for exploring its semantical counterpart: the analysis of the logical form of sentences attributing complementary temporal properties to current objects. Four analyses will be presented, and the ability of each one to account for the linguistic data will be explained. The semantical issue will be preceded by some introductory remarks on the role of temporal references in the evaluation of declarative sentences.

I

One of the problems which any ontologist must face today — unless he is constrained to provide just models simply as devices for interpreting logical languages — is called 'the problem of change'. We could usually think that any arbitrary current object (a ball, a tree, a person...), say O, a persisting entity from t to t',¹ satisfies the two following requirements:

- (1) It is possible that there is a property ϕ such that $\phi(O)$ at t, but no- $\phi(O)$ at t'.
- (2) O-at-t = O-at-t'.

Nevertheless, Leibniz's Law or the so-called 'principle of the indiscernibility of identicals', cannot allow (2), given the fact that $\phi(O)$ at t, but no- $\phi(O)$ at t': according to the principle, the object O cannot be the same at t and t', because O-at-t is not indiscernible of O-at-t'. If Leibniz's Law is valid, the existence of continuants is *prima facie* incompatible with the possibility of change. Indeed (3)

- (3) If O-at-t = O-at-t', then, for every ϕ : $\phi(O\text{-at-t})$ if and only if $\phi(O\text{-at-t}')$

¹ An entity persists from t to t' if and only if it exists at t and t'.

is incompatible with (1) and (2). If the continuant is wholly the same at t and t' , then it must have the same properties at t and t' . This is the incompatibility that constitutes the problem of change for the continuants theorists, the philosophers holding that current objects are continuants or entities that endure or persist by being wholly present through time. Four-dimensionalists, who maintain that current objects are only partially present at each moment of their existence do not have to solve this problem:² they would deny the truth of (2), so that the object at t need not be indiscernible from the object at t' . O -at- t is a temporal part of O , different from the temporal part O -at- t' . On the other hand, the four-dimensional whole and each of its temporal parts, in so far as they are the same, fully satisfy the requirement of indiscernibility.

Supposing we espouse continuants, what solutions could a continuants theorist put forward to the problem of change? Basically, he has to impose temporal restrictions on certain notions linked to the notion of a property.³ This can be done by means of three procedures: temporal relativization of the notion of property (relative property theory), relativization of the instantiation relation (relative instantiation theory) or constraint of the possession of a property to the present time (theory of present possession of properties).⁴

According to the relative property theory, although Leibniz's Law is applied universally with no restriction, ' ϕ ' takes as values in (3) entities of the type t /white, t' /seated, t'' /bald. Properties are relative to times. A sentence such as 'the vase is white' is elliptical: it is not mentioned specifically but it is presupposed the time at which the object possesses the property. In fact, the logical structure of the sentence is provided not by ' $\phi(O)$ ' but by ' $(t/\phi)(O)$ '.⁵ In this way, Leibniz's Law is consistent with the existence of continuants and the possibility of change, since (3a) is true:

(3a). If O -at- $t = O$ -at- t' , then for every t/ϕ : $(t/\phi)(O$ -at- $t)$ if and only if $(t/\phi)(O$ -at- $t')$

² Four-dimensional objects are perduring objects, not enduring ones (Johnston's terminology, see Johnston 1984).

³ I leave aside another alternative: to impose temporal restrictions on Leibniz's Law. As far as I can see, this is the way chosen by Myro (1986), who aims to hold that Leibniz's Law is valid exclusively for cases of synchronic identity. To my mind there is no rationale to maintain this easy way out of the puzzle that the problem of change poses: friends of continuants are distinguished precisely by their insistence on the universal application of the Law at all costs (I am thinking of the dispute related to constitution and identity, where they take the Law as demanding modal indiscernibility too), so how can they now justify a restricted reading of it?

⁴ The first theory is defended by Quinton (1973), the second by Haslanger (1989) and Johnston (1993) and the third by Merricks (1994). An excellent critical introduction to all of these theories can be found in chapter 6 of Denkel (1996).

⁵ Where ' t/ϕ ' means: the property ϕ as it occurs at time t .

Indeed, any assigning of values which satisfies $(t/\phi)(O\text{-at-}t)$ also satisfies $(t/\phi)(O\text{-at-}t')$. If yesterday at 3.30 the vase is green-yesterday-at 3.30, today at 10.15 the vase «is still» green-yesterday-at-3.30. If a property relative to a time applies to an object, it applies eternally, or to be more precise, timelessly. The only kind of impossible situation according to the law formulated in this way would be one in which an object had at the same time a property and its complementary.

Lewis says that any solution to the problem of change must respect our notion of intrinsic property. Objects possess what he terms ‘intrinsic temporary properties’, that is, non-relational properties which objects possess at one time, but lose at another. The question is: how is it that the same thing can possess complementary intrinsic properties? If the vase is white and is then painted green, since the vase is one and the same before and after the change, how can it be white and green? What this amounts to in short is the old Parmenidean question: «How is it that the same object can possess contrary properties?» The quick answer, «because an object can possess contrary properties as long as it does so at different times»⁶ only succeeds in admitting that it is possible «in some way», but the point at stake is precisely in what way, if there is one at all. As we can see, Lewis (1986, 202-204) shows the importance of respecting our notion of intrinsic property when tackling the problem of change. He terms it ‘the problem of temporary intrinsics’. It is clear that the relative property theory denies that there are temporary intrinsic properties: t/white is not an intrinsic property, not because it is not intrinsic, but because it is not a property, since it is a hidden relation.⁷

Notice that relative property theorists cannot allow the current logical inference from (4) to (5)

(4) $(t/\phi)(O)$

(5) $\phi(O)$

because according to the theory’s main claim (5) is badly constructed. The blocking of that inference, nonetheless, could not by itself constitute a powerful objection to that theory. But what follows is. Johnston (see Johnston, 1993, 267) points out that if the theory were correct, what we consider duplicates would not in fact be duplicates, unless they shared all their properties relativized to times. However, we consider duplicates to be objects that possess exactly the same properties, even if they possess them at different times. The causal effects of duplicates are the same regardless of the time at which they possess them. This is certainly a strong objection to the theory.

Some philosophers, Johnston among them, have maintained that, although the theory explained above is incorrect in letter, it is correct in spirit and some

⁶ This appears to be the «solution» offered by Coburn (1976, 174).

⁷ It is worth noting here that we may talk of ‘intrinsic relations’ and ‘extrinsic relations’ in such a way that the intrinsic feature is not something that belongs exclusively to the notion of property. A relationship is intrinsic when it «supervenes on the intrinsic natures of its *relata*» (Lewis, 1986, 62).

modifications can make it acceptable. It is not properties that are relative to times, but rather is the relation or the fact of instantiation of such properties. The relative instantiation theory may be built from the following line of reasoning. Recall that according to the relative property theory, every property is a relation to a time. Note that this relation may be contingent or necessary. If it were contingent, it would make sense to speak of properties regardless of the time at which the objects possess them, but this is precisely what the theory rejects. According to the relative property theory, as we saw, properties are necessarily relations to times. The property of being *t*/white, must be-at-*t*, it could not be-at-*t'*, because, in that case, it would be a different property. All the same, it seems odd for someone to believe that properties as universals should have such essential features; it seems more reasonable if one considers them as particulars. The particular property of the whiteness of this object now would be different if the time were different. Relativization of properties is said of particulars, not of universals.

The first modification of the relative property theory relativizes the fact of instantiation. A second possible one relativizes the instantiations themselves, so that its associated ontology can do without universals, replacing them with similarity classes of particular properties (the 'tropes' of D. C. Williams, 1953). The first modification, which I shall discuss in this section,⁸ is the theory originally put forward by Johnston (1993) and Haslanger (1989).

According to Johnston, it is true that the property being white is the same at *t* as at *t'*, and for this reason we cannot admit the relativity of properties with respect to the times to which they apply; but the instantiation relation is relative to time. Most temporal accounts are provided adverbially: time may be understood as the mode in

⁸ The reason why I will not deal with the second modification of the relative property theory is because it is in the long term subject to the same criticisms as the original theory. Those who maintain that objects are (partially or not) composed of particularized properties need, in order to explain the identical causal effects of some of those properties (*being white at t* and *non-being white at t'*) to admit certain degrees of similarity between them. Similarity can be primitive or not. If it is, what justifies the identity of causal effects between different particularized properties is that they belong to the same set. If this is not the case, it is understood that such properties are strictly instantiations of universals, so their identical causal potential is due to their being instantiations of the same universal. In the first case, the property of being white is the set in question, in the second case it is the universal. And, unless we relativize to times the properties of belonging to the same set or of being an instantiation of the same universal, the problem of temporary intrinsics rises from its ashes. To reformulate the issue in the terms which the new theory requires, the problem consists in explaining either how it is that the same object possesses particularized properties which belong to sets of complementary properties or else how it is that the object is constituted by instantiations of complementary universals (where a complementary universal is, given the universal *f*, the universal which corresponds to the predicate '*not-f*').

which individuals possess properties.⁹ For Johnston, (4) and (5) would be analyzed as follows:

(4a) (t/is) (O, ϕ) or else O instantiates-at-t ϕ

(5a) (is) (O, ϕ) or else O instantiates ϕ

However, parallel to the relative property theory, the relative instantiation theory (or, as it is usually called, ‘the adverbial theory’) cannot accept the validity of the inference from (4a) to the ill-constructed (5a), as it does not admit a notion of non-relative or simpliciter instantiation. The relative property theory did not accept the notion of possession of simpliciter properties; the relative instantiation theory will not tolerate the notion of simpliciter possession of properties. If this is the case, the relative instantiation theory evades the objection of failing to recognize the intrinsic character of properties. Nevertheless, Lewis does not appear to think in this way, he considers this theory as a mere variation on the previous one: «the adverbial variant ... puts the relationality not in the shapes themselves but in the having of them: there is a three-place relation of instantiation, this relation holds between me and bentness and some times, and it holds between me and straightness and other times. I ask: what does standing in some relation to straightness have to do with just plain being straight? And the variant still claims that to be shaped is to stand in relations to other things, inter alia to times. I say it still amounts to a denial that things have temporary intrinsics.»¹⁰ How can this last sentence be justified? In my opinion, Lewis would appear to believe that if the property is that of being white, the intrinsic character of the property is lost whether we relativize the subject (being-white-at-t) or we relativize the verb (being-at-t-white).¹¹ Even if this reading of the theory were not appropriate, I cannot see how the problem of duplicates can be made to disappear — which Johnston regards as a definitive objection to the relative property theory that does not affect his own. A duplicate of an object is that which instantiates its own intrinsic properties. Now, since for the friend of relative instantiation it is not licit to refer to instantiation simpliciter, duplicates, in order to be duplicates, will have to instantiate-in-the-same-way the same intrinsic properties.

The friends of this theory consider that the semantic function of the temporal indicator is that of an adverbial which modifies the verb ‘to be’. ‘Being-at-t rich’ functions like ‘being extremely rich’, so we can express it as: ‘being tly rich’. Despite the lack of euphony, thinks Johnston, the analogy is correct. However, in my opinion, no basis has been given for the sense in which time can modify the possession of a property. We understand perfectly the sense in which the word ‘extremely’ modifies in terms of precision ‘being rich’, but we do not understand — without a good

⁹ See his paper «Is there a problem about persistence?», in H.W. Noonan (1993, 261-289).

¹⁰ D. Lewis (1988, 66, note 1).

¹¹ I imagine that Merricks (1994) interprets this theory analogously when he accuses it of introducing esoteric properties such as *being-at-t* or *tly white*.

explanation, at least — how the supposed adverbial ‘tly’ does. The friend of this theory, of course, will point out that no other adverbial can be strictly analogous to the adverbial ‘tly’ as it is required specially for certain verbs which attribute properties to temporal objects. Johnston does not explain what this special modification of the time-adverbial mentioned might consist in, but he says that he considers it to be analogous to that which modal indicators perform.

The relative instantiation theory constitutes an effective response from the continuants theory to the problem of temporary intrinsics: it manages to maintain the compatibility between the changing of temporal objects and Leibniz’s Law without sacrificing our notion of property simpliciter, an essential and fundamental element of our notion of a duplicate. Rejecting a notion of instantiation simpliciter, while it may be open to debate, does not involve, however, such a high cost as the rejection of the relative property theory did. Furthermore, with a sound metaphysical justification, it would not involve any cost at all.

There is another way, however, to solve the problem of change: to say that an object only possesses the properties it has at the actual or present time. This is the position of the theory of present possession of properties, which analyzes the verb ‘to be’ as making an implicit reference to the time of utterance, in such a way that the verb ‘to be’ is always elliptical with respect to (or has the same intension as) ‘being now’.

Let us suppose that Charles was blond in 1970, now he is grey-haired and in the future he will be bald. According to the usual interpretation of the sentences ‘Charles is blond’, ‘Charles is grey-haired’ and ‘Charles is bald’, we attribute the truth-value false to the first and third sentences, and the value true to the second, since Charles is-now not blond and Charles is-now not bald, but is-now grey-haired. An object does not *now* possess its past properties nor does it *yet* possess its future properties, so ‘ $\phi(O)$ ’ is true if and only if ‘now $\phi(O)$ ’ is true also.

According to this theory, neither properties nor their instantiations are time-relations: properties are genuine and intrinsic, and it makes sense to speak of their possession simpliciter. An object does not possess timelessly all its properties in any of the senses of the term ‘possess’, but rather may possess complementary properties at different moments of time: properties are temporal. And none of this is in conflict with Leibniz’s Law, since an object only possesses its present properties, not those of its past or future, so if O is ϕ but was or will be not- ϕ , there is no contradiction, whereas there would be if O were ϕ and not- ϕ now, in the present.¹²

¹² This appears to be the solution of Merricks (1994). On p.177 he says: «My exemplifying ‘being F at t ’, does not imply I exemplify ‘being F ’, for t may not be present. My being F at t , therefore, is compatible with my being not F ». On p. 178: «the only properties an object has are the properties it has now». And note 18: «My claim that the only properties an object has are the ones it has now is consistent with the claim that an object O can have a property F at a time t other than the present-just so long as O ’s having F at some time t means that O now has the property ‘being F at t ’».

However, despite the ease with which this theory rids itself of the deficiencies of the two theories mentioned previously, it has at least three serious drawbacks.¹³

The first, in fact, is something more than a drawback, since it denies the fact which it sets out to explain. Let us remember that our object was to explain persistence in spite of change: how it is that an object can be ϕ at t and not- ϕ at t' . However, according to theory outlined above, it is not possible for an object to be ϕ at t unless t is present. The object only possesses its present properties, it no longer possesses those it had in the past nor yet those it will have in the future. But then, the object neither persists nor changes. Nothing is (simpliciter) ϕ at t , when t is past or future. Unless the object is a substrate, if it does not possess its past or future properties, then the object does not exist in the past or in the future, so it does not persist. If it does not persist, it does not change: change implies that there is a persisting object that has complementary properties at different times. If objects do not change, then obviously the problem of temporary intrinsics vanishes. But at the cost of many other vanishings whose legitimacy is highly dubious.

A rapid way of providing a defence against the above criticism would be to say that, simply, the persistence of an object consists in that it existed at certain times, it exists now and it *will* exist in others. If this is to accept persistence, then no one can deny it. This answer trivializes the theory, in what Lewis considered the accepting that, in one way or another, things persist. Merricks' claim that only the present exists may be interpreted in at least two ways. According to the first, 'to exist' must be interpreted as 'to-exist-at-the-same-moment-as-the-utterance-of-the-sentence'. If this is the reading that Merricks makes of (*) 'only the present exists' then the sentence expresses a tautology, the same expressed by 'only the present is present'. Another reading of (*) is to assume that 'to exist' means 'to be real', in the same sense in which we say that the world is the set of real events. This interpretation commits Merricks to a parallelism between worlds and times that is highly debatable, namely, that the real world is to possible worlds what the present is to past and future times. Merricks declares himself to be an actualist (on p.77, n.15 he says that he understands possible worlds in the same sense as Plantinga, not in that of Lewis) and a presentist¹⁴ (he states that, since the modal question is analogous to the temporal question, the real world is to the present what the possible worlds are to the past and future). His position consists in treating possible worlds as constructed from the real world, a theory which is entirely respectable. However, with times the matter is not so straightforward: the future and the past do not appear to be constructed on the basis of the present, or at least, it is by

¹³ Lewis (1988, 66) believes that the most serious defect of this theory is that it denies the reality of the past and future and regards them as *ersatz* times. Indeed, I assume that this is the basic metaphysical deficiency from which stem all the inadequacies of the theory that I outline in the text below.

¹⁴ The term is from R.M. Adams (1981, 23).

no means clear how we may understand such a «construction».¹⁵ In the last analysis, the future (or the past) does not appear to be on the same ontological level as a possible world: my expectations are not frustrated if I fail in a possible world, but this *is* the case if I do in the real future. In certain parts of his paper, (such as, for example, on p. 180) the author appears to commit himself to the first of the interpretations given above. But, what interest can such an assertion have? A tautology is implied by every theory, so a four-dimensionalist could also accept Merrick's viewpoint. When Merricks explains why a four-dimensionalist could not accept his theory (p.181) he seems, however, to be committing himself to the second interpretation which I have given above. And this, as I have said, is highly debatable: it does not appear to explain what persistence and change consist in.

However, all things considered, perhaps this theory may be able to account for persistence and change in a non-trivializing manner. We simply have to find the correct way to reformulate them. An object O persists from t to t' if 'O exists-now' is a true utterance at t and at t'.

Secondly, let us recall that both the relative property theory and that of relative instantiation rule out, very reasonably, the possibility that the same object possesses complementary properties at the same moment in time. However, the theory of present possession of properties only rules out the possibility that an object possesses complementary properties *now*, not that it possesses them in the past or future. Nevertheless, white and not-white are just as complementary in 1990 as they are in 1995. The supporter of the present possession of properties theory would appear to claim that the ontological status of the past and the future is substantially different from that of the present. Beneath this theory there appears to lie a conception based on the typical 'myth of the passage of time'¹⁶, according to which time itself passes or changes by taking objects from the past to the present and thence to the future. Objects, however, do not change by ceasing to be past and becoming present or future. Whether they be past, present or future is a matter essentially relative to the speaker.¹⁷

The third drawback is the inability of this theory to establish a metaphysical distinction that I consider unavoidable. To affirm in a neutral sense with respect to time that $\phi(O)$ means that O in the *real* world was, is, or will be ϕ . To reject this neutral sense of the sentence is an impediment to distinguishing the real course of events from

¹⁵ I know of only one theory, highly psychologistic by the way, which takes this into consideration: that of Augustine of Hippo, according to which there are three times: present of past things, present of present things and present of future things (see *Confessions*, XI, 20, 26) puede

¹⁶ The expression was coined by D. C. Williams (1951). The idea is also present in Prior (1968, 1).

¹⁷ I have no wish to go into detail over questions relating to the ontology of time, since the subject is excessively problematic to be dealt with here and the most sensible course is to leave it aside for the moment.

the course of merely possible events. According to this theory, $\phi(O)$ is true if and only if O is now ϕ , and is false whether O was or will be ϕ as much as if O never was ϕ , is ϕ or never will be ϕ . However, it is obvious that there is a difference which must be accounted for between the real pasts and futures and those which are merely possible: if the real future does not exist, it is a non-existence of a different order from the non-existence of a future which is a mere possibility. This latter will not have any bearing on the decisions taken by someone who deals on the stock exchange.

II

Now let's move on from the metaphysical question to a matter which arises naturally from the remarks made in this first section. In the preceding pages I approached the problem of temporary intrinsics as a metaphysical problem for continuants theorists: to explain how an object may persist in spite of the alteration of its intrinsic properties. But it is clear that this is linked to a semantical issue: how to give the logical form of sentences which attribute temporal properties in such a way that no contradiction arises by attributing complementary properties to the same object.¹⁸ For Lowe, such problems must be resolved separately: a theory which set out to solve them simultaneously would fail to provide satisfactory answers to any of them. In my opinion, however, the situation is precisely the opposite. The *sine qua non* of any solution to the metaphysical problem is its contribution to the providing of elements for a solution to the semantic problem (the entities which we will be committed to must function as referents of certain linguistic terms). This is also true in reverse, if we interpret a sentence that attributes temporal properties to a persisting object as one that quantifies over certain entities, we must be sure that our ontology provides us with the appropriate category of entities to serve as the corresponding referents. Any attempt to resolve the two problems separately will inevitably fail. A semantic theory must be able to justify its ontological commitment; one cannot offer it as a mere strategy for «saving the phenomena». If a property is analyzed in semantic terms as a relation to a time, the analysis must be justified in metaphysical terms. If such a justification were not necessary, then any semantic theory which could account for events and linguistic inferences would be acceptable, regardless of any metaphysical consideration. But this is not the case. Lowe himself welcomes the semantic thesis of the relative instantiation theory because it seems to him to be «the least revisionary with respect to our common-sense talk of persistence through change».¹⁹ If we believe that it is appropriate to respect this way of speaking it is because we believe that the metaphysics that supports it is the correct one, or the least problematic.

Before going through the semantic proposals for the analysis of sentences of the type 'O is ϕ at t', it is helpful to mark out the territory in which they are developed and to signpost the general framework in which they are inserted.

¹⁸ Lowe (1988, 72-73).

¹⁹ *Ibid.*, p. 73. It is surprising that his metaphysical argument of fundamental particles contributes absolutely nothing in terms of referents for singular terms in his semantics.

Traditionally — according to the ideas of Prior (1968) — temporal semantics has worked in close parallel with modal semantics. Sentences of the type: ‘modal operator $[\phi]$ ’ have served as a semantic model for sentences of the type ‘temporal operator $[\phi]$ ’: ‘it happened that’ would express, in the same way as ‘it is possible that’, a function from indices to truth values (the indices would be times in the case of the temporal operator and possible worlds in the case of the modal operator) In the same way that the semantic value of a modal sentence is constructed starting from the semantic value of an expression which speaks of the real world (‘it is possible that [Richard Nixon resigned]’), the semantic value of a sentence in the future or in the past is constructed on the basis of the semantic value of an expression which speaks of the present world (‘it happened that [Richard Nixon resigned]’). The justification for the temporal case is that we can intuitively evaluate the truth value of the sentence in the past, ‘P $[\phi]$ ’, or in the future, ‘F $[\phi]$ ’, in the following way: ‘P $[\phi]$ ’ is true at t , if there is a $t' < t$ with respect to which ‘ ϕ ’ is true. ‘F $[\phi]$ ’ is true at t , if there is a $t' > t$ with respect to which ‘ ϕ ’ is true. The specifying of the truth conditions of temporal sentences is more or less complex depending on the type of temporal operator: it may be a general operator (‘always’, ‘sometimes’), a specific operator (‘in 1456’, ‘yesterday’) or an operator in the simple past or future (‘she listened’, ‘it *will* rain’). Henceforth, given the global nature of the remarks I intend to make, I shall use the letters ‘P’ and ‘F’ to designate the temporal operator for the past and for the future, respectively, without taking into account the difference between the types of operators mentioned.

If the analogy with modal semantics is valid, the evaluation of temporal sentences will therefore vary with time, as the evaluation of modal sentences will vary depending on the possible world under consideration. We shall say that:

(1) The ruling of the Supreme Court induces Richard Nixon to resign.

is true as of August 8th, 1974, but false on the previous day, analogously to its truth in the real world but not in other possible worlds. As long as accepting this analogy does not require us to place the ontological status of the real world on the same level as the present,²⁰ I have no objection to adopting it, as it accounts for our usual methods of evaluating sentences. The fact that our evaluations differ depending on time reflects in a technical sense the idea that what we say may be true in one time, but false in another: taking a sentence of the type ‘temporal operator $[\phi]$ ’, the truth value of ‘ ϕ ’ depends in part on the moment of time to which the operator refers.

²⁰ Evans (1985) believes that if we take modal semantics as our model for a temporal semantics, we accept implicitly that metaphysical background. Of course, although the evaluation of temporal sentences varies with the time, it seems clear that the way in which the truth of a modal sentence depends on the truth of a certain sentence in the real world is not analogous to the way in which the truth of a sentence in the past depends on the truth of another sentence in the present: the truth-value of ‘Richard Nixon left the White House’ does not depend on any true sentence concerning our present.

So what is the semantic and syntactic category of ‘ ϕ ’? If its syntactic character is declarative (if it possesses as a semantic value a proposition or function from possible worlds to truth values), then in no coherent sense can we say that ‘what we say’ therewith varies in terms of its truth value depending on time, since every proposition, in so far as it contains information, is eternal. Supposedly, some stoic and scholastic theories tried to reconcile the idea that a sentence that is neutral with respect to time could express a proposition whose truth value would vary when the sentence (not the proposition) was completed with a time reference. All the same, to claim that a proposition is an incomplete informational content or that it is one which requires semantic determination is simply a *contradictio in terminis*. M. Richard (1980, 14ff) maintains that our attributions of common-sense belief may only be analyzed correctly if we understand the contents of belief to be eternal propositions. Let us consider the following pair of sentences:

α . In 1973 Helen believed that Richard Nixon was the President of the United States.

β . Helen still believes what she believed in 1973.

What is the content of Helen’s belief? If the object of Helen’s belief at α were the temporalized proposition expressed as ‘Richard Nixon was the President of the United States in 1973’, while at β her belief would correspond to the temporalized proposition expressed as ‘Richard Nixon is the President of the United States in 1997’, then from α and β would follow the proposition γ :

γ : Helen believes that Richard Nixon is the President of the United States in 1997.

However, it does not appear to be reasonable to attribute this belief to Helen because of α and β . If, on the other hand, instead of believing that a sentence expresses an incomplete proposition which becomes complete when it is temporalized by the context, we believe that a sentence always expresses the same proposition, in this case, that which corresponds to ‘Richard Nixon is now the President of the United States’, our analysis of belief-attributing sentences will produce the appropriate results. From α and β follows the reasonable proposition γ ’:

γ ’: Helen believes that Richard Nixon was the President of the United States in 1973.

But then, if ‘ ϕ ’ expresses a (complete) proposition, i.e. if it already contains an implicit reference to the time of its evaluation, then the temporal operators become superfluous. If (1) contains an implicit reference to 08/08/74, then what function will the operator ‘08/08/74’ perform when it appears explicitly in the sentence? Syntactically, the operator would be an adverbial-type expression (of the type $\langle t, t \rangle$ in Montague’s semantics, an expression which, when applied to a sentence, yields another

sentence as a value).²¹ Semantically, however, it would provide no more information than what was already assumed.

One of the questions in dispute concerning temporal semantics is, as can be seen, whether or not sentences that lack an explicit temporal reference contain an implicit reference to the time at which they are to be evaluated. Eternalist semantics²² maintains that a sentence like (1) expresses different propositions according to the implicit reference to a time that it contains. According to temporalist semantics²³ this sentence always expresses the same proposition (temporally neutral) whose truth value varies according to the time in which it is evaluated (such a proposition would be a function assigning to each possible world the set of times in which the proposition is true in it). This latter semantics explains in this way the function of the temporal operator: the embedding of the temporal operator in the temporally neutral proposition expressed by ‘ ϕ ’ would produce a temporally definite proposition. Nevertheless, this notion of a ‘temporally neutral proposition’ is something we have already seen to be somehow suspect.

Besides, the syntactic category of ‘ ϕ ’ may not, after all, be enunciative. If ‘ ϕ ’ has a predicative category (if it possesses as its semantic value a function from possible individuals to truth values), then maybe we will be able to reconcile the two theses which so far seemed incompatible, namely, (i) that ‘what we say’ is complete and determined with respect to every index, i.e., it has an eternal value, and (ii) that ‘what we say’ is sensitive to the time of reference. Evans (1985b) presents a theory, which he calls ‘T3’, in which ‘ ϕ ’ in ‘P[ϕ]’ has a predicative value,²⁴ which is completed with

²¹ Montague’s syntactical categorization is easily understood. I shall offer here a brief guide to it, as I shall be using his notation in part of this section. Proper nouns and individual variables are of type **e**, sentences are of type **t**, monadic predicates are of type $\langle \mathbf{e}, \mathbf{t} \rangle$, diadics are of type $\langle \mathbf{e}, \langle \mathbf{e}, \mathbf{t} \rangle \rangle$. In general, an expression α is of the type $\langle \mathbf{x}, \mathbf{y} \rangle$ if and only if when taking as arguments expressions of the type **x**, it yields as values expressions of the type **y**.

²² Richard (1981) and (1982).

²³ Kaplan (1977), in Almog, ed. (1989), especially p. 503, no. 28, where he contrasts his temporalist semantic theory with an eternalist theory.

²⁴ Evans considers previously to T3 another theory, T2, which, in his opinion, also accounts for the relevant linguistic phenomena. According to this theory ‘N’ is ambiguous as regards its predicative or enunciative value. It displays an enunciative value (of type **t**) in so far as it contains a reference to the time of the utterance owing to the implicit indexical ‘now’, which eternalizes the content of ‘N’. Without the implicit indexical it would merely have a predicative value (it would be of type $\langle \mathbf{e}, \mathbf{t} \rangle$), it will be a kind of propositional stem. In line with this theory, the temporal operator ‘now’ would belong to a syntactic category distinct from the rest of temporal operators, as, unlike them, it would be the only one capable of offering a sentence as a value, when applied to the eternalization of ‘N’ executed by a different operator. For example,

a reference to the time of the utterance indicated by the temporal operator. So, ‘ $P[\phi]$ ’ is true at t if and only if there is a $t' > t$ such that the utterance of ‘ ϕ ’ at t' were true (or to put it another way, if and only if ‘now ϕ ’ were true at t'). However, this theory cannot account for all linguistic phenomena. N. Salmon (1989) has shown that theories of this type are unable to discern the difference in truth conditions between the following sentences:

(2a) On 08/08/1973, a fortune-teller predicts that the ruling of the Supreme Court will induce Richard Nixon to resign the following day.

(2b) On 08/08/1973, a fortune-teller predicts that the ruling of the Supreme Court will induce Richard Nixon to resign tomorrow.

If I utter (2a) and (2b) on 07/08/1974, the proposition corresponding to the fortune-teller’s prediction in (2a) is false, whereas that which corresponds to (2b) is true. However, according to Evans’ theory T3, the premonitory sentences (2a) and (2b) would be true if and only if:

(2a’) ‘now the ruling of the Supreme Court will induce Richard Nixon to resign the following day’ were true on 08/08/1973.

(2b’) ‘now the ruling of the Supreme Court will induce Richard Nixon to resign tomorrow’ were true on 08/08/1973.

so that, inevitably, as the operator ‘now’ always has wider scope, the extension of ‘on the following day’ will be the day following that of the utterance and not, as one might have expected, the day following the temporal parameter of the context to which the propositional stem refers. The theory in question is analogously deficient with respect to all types of temporal indexicals. A further example is provided by the following pair of sentences:

(3a) Twenty-five years ago nobody would have believed that the ruling of the Supreme Court would induce the President of the United States to resign.

(3b) Twenty-five years ago nobody would have believed that the ruling of the Supreme Court would induce the actual President of the United States to resign.

where the proposition corresponding to the content of the belief expressed in (3a) is true, whereas one would expect the proposition corresponding to (3b) to be false. According to Evans’ theory, on the other hand, both propositions would be of type ‘**now**[$P[\phi]$]’, and therefore would not be able to account for the truth conditions of (3a).

‘yesterday’, when applied to (1) would offer a predicative expression: ‘yesterday [Richard Nixon resigns]’, which only acquires enunciative value when embedded in ‘**now**[N]’, i.e. as ‘**now** [yesterday [Richard Nixon resigns]]’. Therefore, ‘now’ is of type $\langle t, \langle e, t \rangle \rangle$, while ‘yesterday’ (and all other temporal operators) is of type $\langle \langle e, t \rangle, \langle e, t \rangle \rangle$. Nonetheless, this odd asymmetry in the treatment of one temporal operator with respect to the others appears rather artificial.

Salmon's proposal is based on the necessity of a double indexing: that of the extensions of the expressions to the time of actual utterance, on the one hand, and to other times according to the temporal operators that occur in the sentence, on the other.

It is, in short, a question of recognizing that the semantic value of expressions is sensitive as much to the time of the context of the utterance as to the time marked by the temporal operator. The difference between the truth conditions (2a) and (2b) lies in the fact that the extension of the temporal indexical must be relativized to the time of the temporal operator + 1 in (2a), whereas in (2b) it must be relativized to the context + 1. For Salmon, temporal operators are neither extensional (like the connectives of the language of propositional logic) nor intensional (like modal operators). That they are neither extensional nor truth-functional expressions is demonstrated by the fact that, for example, although relative to 08/08/1973 both 'Richard Nixon resigns' and ' $2^6=2$ ' express false propositions, a sentence such as (4):

(4) On 08/08/1974 Richard Nixon resigned.

expresses a true proposition, whereas 'on 08/08/1974 $2^6 = 2$ ' expresses a false one. It can be shown that the propositions are not intensional either if we consider that, for example, although 'The President of the United States' and 'The actual President of the United States' express the same intension, nevertheless, with respect to 08/08/1974, 'The President of the United States resigned' expresses a true proposition, whereas 'the actual President of the United States resigned' expresses a false proposition. Salmon's theory assigns to ' ϕ ' at 'complete temporal operator [ϕ]' a predicative value and analyzes (4) by segmenting it into the incomplete temporal operator 'on 08/08/1974 [x]' and the temporal sentence 'Richard Nixon resigned', the result of applying the operator 'P[x]' to the propositional stem 'Richard Nixon resigns'. For Salmon, non-general temporal operators are incomplete expressions that are applied to temporal sentences just as singular terms are applied to monadic predicates. In this way, (4) may be seen as the result of applying the incomplete 'on 08/08/1974 [x]' to the temporal sentence 'Richard Nixon resigned', which, in turn, is the result of applying the complete operator 'on 08/08/1974 + past' to the temporally neutral propositional root 'Richard Nixon resigns'. Complete temporal operators are, in fact, *superintensional* operators,²⁵ functions from propositional matrices (Salmon's terminology), neutral with respect to time, to truth values. In this way theses (i) and (ii) are justified: the idea that propositions are eternal is maintained (since ' ϕ ' is not an expression whose semantic value is a proposition, but is rather an attribute, since it is a propositional root) and the different evaluation of our sentences according to the time is accounted for (since the truth value assigned will depend on whether, given a certain time, t , $\phi(t)$ holds true or not): 'what is said' in (1) on 07/08/1974 and on 08/08/1974 is, in some sense, the same content.

III

Having identified the context of semantic issues which a sound analysis of sentences of the type 'O is ϕ at t ' must face, I shall move on to consider the concrete

²⁵ Salmon (1989, 366).

theories derived from the metaphysical theories analyzed in section I. There are basically four possible analyses of sentences of the type ‘O is ϕ at t ’:

- (1) ϕ (t/O)
- (2) (t/ ϕ) (O)
- (3) (t/is) (O, ϕ)
- (4) (t/is-now) (O, ϕ)²⁶

The supporters of a four-dimensionalist metaphysics of temporal parts propose (1), according to which it is the singular term which is modified by the time adverbial. The friends of continuants may propose any one of the remaining three. Those who propose (2) maintain that properties are relations to times; (3) is the analysis offered by those who believe that it is the instantiations of properties that are relative to moments of time, and (4) would be the analysis corresponding to the theory of the present possession of properties. Strictly speaking, none of these analyses contains a suggestion as to how to tackle the question of temporal indexicals, but there is no reason to suppose that they could not incorporate one. The only indication of difficulty may be found in the analysis corresponding to (4), in so far as it is related to Evans’ theory T2, which is semantically unsatisfactory for the reasons already given.²⁷

The four analyses deny the apparent incompatibility of a, b and c:

- a. O is ϕ at t
- b. O at t is O at t'
- c. O is not- ϕ at t'

affirming that:

- (1*) The semantic value of ‘O’ varies according to t
- (2*) The semantic value of ‘ ϕ ’ varies according to t
- (3*) The semantic value of ‘is’ varies according to t
- (4*) The semantic value of ‘is-now’ varies according to t .

All the above can account for the fact that different utterances of the same type, ‘O is ϕ ’, have different semantic values at different times. None of them implies, however, that the evaluation of the sentence varies with the time, that is, none of them accepts (5):

²⁶ My classification is based on that of Haslanger (1989, 7-8), substituting my (4) for his possibility (iv).

²⁷ Assuming that the metaphysically committed interpretation of Merricks’ theory that I offered in section I is correct, how would one explain those propositional attitudes whose content were singular propositions referring to past objects?

(5) The semantic value of ‘true’ varies according to t .

To accept (5) would mean rejecting the notion of «true *simpliciter*», admitting only relative notions of the type « t /true», analogous to « W /true», «true at the possible world W ». Such a theory would commit itself either to modal and temporal possibilism *B la Lewis* (according to whom «true *simpliciter*», is like $_ \text{true}@$), or to modal actualism and presentism *B la Merricks* (according to whom «true *simpliciter*» is like «true now»).²⁸ At least the analyses offered by (1), (2), and (3) are perfectly compatible with a modal actualist and temporal realist position, which, unless some convincing metaphysical argument comes along to demonstrate the contrary, is the most appealing theoretical position from my point of view. (4), on the other hand, while it is compatible with modal actualism, is not compatible — as I understand it — with temporal realism.

The relativized terms for each of the theories and their respective syntactical and semantic categories would be as follows:

	syntactic category	semantic category	
(1**)	t/O	e	individual
(2**)	t/ϕ	$\langle e,t \rangle$	function from possible individuals to truth values (set of possible individuals which are ϕ at t)
(3**)	t/is	$\langle \langle e,\langle e,t \rangle,t \rangle$	function from possible worlds to truth values
		(or tly $\langle t,t \rangle$)	(set of possible worlds in which some object has some property at t)
(4**)	$t/is\text{-now}$	$\langle \langle e,\langle e,t \rangle,t \rangle$	function from possible worlds to truth values (set of possible worlds in which some object has some property at t)

We may note that none of these theories — except, perhaps that which corresponds to (1) — will admit in its semantics expressions that take moments of time as arguments, since expressions relativized to moments of time are considered to be primitive.

The theories which offer the analyses (1) and (4) are the only ones that provide a specific semantics for ‘ O at t ’:

(1***) ‘ O at t ’ refers to the temporal part of O that exists at t

(4***) ‘ O at t ’ refers to the object O which exists at t when t is present

The expression ‘ O at t ’ is a component which may be segmented without syntactic or semantic violence from ‘ O is ϕ at t ’, as is shown by our everyday usage

²⁸ Evans (1985, 362-363) says that to relativize the evaluation of sentences to times is to commit oneself directly to modal and temporal possibilism.

with reference to certain objects in given circumstances or at given moments, identifiable regardless of the theory of persistence that we choose to adopt:

- a. Emily at the time was very naive.
- b. When Fred gets drunk (drunken Fred) he always gets weepy.
- c. You'll love the taste of this piece of newly-baked bread.
- d. John Major in 1992 had more supporters than John Major in 1997.

All of these sentences can be easily analyzed using the semantic theory that corresponds to the four-dimensionalist theory, but there are other possible analyses compatible with the theory of continuants that could account for them perfectly well. The semantic theory of temporally indexed objects is able to analyze this type of sentences, in terms of expressions of the type 't/O', as well as this other type of sentences, in terms of non-relativized 'O':

- e. Emily is a human being.
- f. This piece of bread is leavened flour.

Nevertheless, we must explain what the relation is between 'O at t' and 'O'. Quine (1992, 172) proposes analyzing 'O at t' as denoting the common element of O and t, where 't' refers to the four-dimensional fragment (heterogeneous and discontinuous, if ever there was one) of the material world which exists at that time and 'O', in its turn, refers to a certain four-dimensional object. His treatment would be analogous to that of 'white flour', which would refer to the common element that exists between being white (or the set of white objects) and «flourness». Quine's analysis also permits us to analyze expressions of the type 'the intellectuals of the 18th century' or 'wine of the vintage of 66', which refer to classes, as classes of temporal parts of objects. Thus, 'the intellectuals of the 18th century' would be analyzed as: the y: $\exists x (y = 18\text{th cent.}/x \wedge x \text{ is an intellectual})$. In general, 'the z at t' would refer to the y: $\exists x (y = t/x \wedge x \in z)$. Quine's proposal may be accommodated if desired by discarding his materialist ideas, which restrict the reference of the terms to the material world, along with his extensionalism, adopting instead an intensional semantics that includes the content of predicates, singular and general terms, and sentences.

The semantics put forward by the four-dimensionalists is fully coherent with its ontology. In (1), the modifying of the singular term by the time adverbial is justified because the object from which a property is predicated is a temporal part. In case (2), the ontological counterpart of the expression 't/ϕ' would have to be a relational property, a different one whether 'ϕ' referred to a property possessed by different objects, or in the case whereby t varied (an analysis which, although metaphysically questionable, does not appear to me to be open to semantical objections; *mutatis mutandis* for case (3)).

Four-dimensionalist semantics, with its temporally indexed subjects, would appear at first sight to present a serious drawback. Apparently, it must establish two possible types of references for singular terms. On the one hand, a proper noun may

refer to the maximal sum of the temporal parts of an object, as in the case of the proper noun of this sentence:

g. Peter is a person

or it may refer only to one or several of its temporal parts, as in the case:

h. Peter was blond in 1970,

a «transparent» reading of which would be: ‘Peter-in-1970 is blond’.²⁹ In general, the first case would apply when the predicated property is expressed by a sortal term of substance (such as ‘human being’, ‘house’, ‘tiger’) or by a term applicable to the entire temporal course of an object (such as ‘to be the son of’, ‘to be younger than’); the second case would apply when the predicate is a phase sortal or other predicate of temporally restricted application (such as ‘to be seated’, ‘to be an adult’, ‘to paint a picture’). So then, to what extent does this constitute a stumbling-block for the four-dimensionalist semantic theory? If it were unavoidable for this semantic theory to fix two types of referents for different tokens of the same singular term, then there would be a clear mismatch between the semantic theory and the way in which natural language functions in terms of usage: the linguistic data do not appear to point to any such systematic ambiguity of singular terms.

In fact, it is not necessary to postulate such an ambiguity for a four-dimensionalist semantics. We may say that singular terms always refer to maximal sums of temporal parts, although their reference must necessarily be fixed by means of a temporal part, since the sum is epistemologically beyond our reach due to the excessive «length» of the space-time region it occupies. Language, according to the four-dimensionalist, would be essentially metonymic: we name the whole by pointing to one of its parts. A sentence of the type ‘O is ϕ at t ’, although it has to do always with the sum total of temporal parts of a certain type, is a sentence which may be analyzed as ‘O has a temporal-part-at- t which is ϕ ’. Thus, ‘Peter was blond in 1970’ would be analyzed as ‘Peter has a temporal-part-at-1970 that is blond’. Sentences like *g* or *h*, therefore, deal with or quantify upon persisting objects, as one would have expected. The difference between one with respect to the other may be seen as the consequence of the scope of application of the corresponding predicates (in *g* the predicate applies to the object at all times, whereas in *h* only at certain times). The «transparent» reading in each case would be as follows:

g’. There is an x such that $P(t/O, x)$ and, for every time t , if t/O exists, then there is a property ϕ (=to be a person), such that $\phi(t/O)$.

²⁹ Perry (1972, sec. V) offers a clear exposition of the two basic semantics of temporal parts. According to the first, supported by Smart, proper nouns would refer to temporal parts of four-dimensional objects; according to the second, they would refer to four-dimensional objects themselves. Although the two positions can account for the facts, I feel it is more convenient to adopt the second, as I shall explain below, since in this way, we can minimize the discrepancies between the analysis and the truth value customarily attributed to many identity sentences. See below in this section. See also Inwagen (1990).

h' . There is an x such that $P(t/O, x)$ and there is a time $t=1970$ and a property ϕ (=to be blond) such that $\phi(t/O)$.

A clear exposition of the metonymic character of language may be provided by the analyses of the following identity sentences:

- i. Borges is the author of *Fictions*.
- j. The baby in the photograph is the present managing director of the firm.
- k. This statue is this piece of clay.

whose truth conditions would be expressed by:

i' . The four-dimensional object to which, perceiving one of its temporal personal parts, the name 'Borges' was given, consists of the same maximal set of temporal personal parts (= is the same) as the four-dimensional object one of whose temporal parts wrote *Fictions*.

j' . The four-dimensional object to which I refer as 'the baby in the photograph' by pointing out to one of its temporal parts consists of the same maximal set of temporal personal parts (= is the same) as the object to which I refer as 'the present managing director of the firm' pointing out to one of its temporal parts.

k' . There is a four-dimensional object such that the temporal part thereof to which I refer as 'this statue' is the same as that to which I refer as 'this piece of clay'.

The advantage of analyzing everyday language as a metonymic language which quantifies over persisting objects and not over temporal parts is that we can retain the common-sense belief that identity sentences such as i or j may be true identity sentences in certain circumstances, and not systematically false, as they would be if their corresponding singular terms were interpreted as referring to temporal parts. Clearly, j would then be a false identity sentence, since the temporary part named as 'the baby in the photograph' could not be identical (but rather gen-identical) to that named as 'the present managing-director of the firm'.

Apparently, the semantic theories derived from the continuants theory do not have the same problems of mismatch with everyday language. There are no temporal parts of objects to refer to, but instead different occurrences of the same complete object. Nevertheless, I think that the continuants theorist is ontologically committed to certain core-continuants, commitment which would suppose certain problems of mismatch with everyday language. But, to see what is involved here we would need to go back to the metaphysical debate, which would define a subject for a different paper.

REFERENCES

- Adams, R. 1981: «Actualism and thisness», *Synthese*, 49, 3-42.
- Coburn, R. 1976: «The persistence of bodies», *American Philosophical Quarterly*, 13, 3, 173-184.

- Denkel, A. 1996: *Object and property* (Cambridge: Cambridge University Press).
- Evans, G. 1985: «Does tense logic rest upon a mistake?», *Collected Papers* (Oxford: Clarendon Press), 343-363.
- Haslanger, S. 1989: «Persistence, change and explanation», *Philosophical Studies*, 56, 1, 1-28.
- Inwagen, P. V. 1990: «Four dimensional objects», *Noûs*, 24, 245-255.
- Johnston, M. 1984: *Particulars and persistence* (Princeton University, University Microfilms International).
- _____ and Forbes, G. 1993: «Is there a problem about persistence?», reprinted in Noonan, H. W., ed., 1993: *Identity* (Aldershot: Dartmouth Publ. Co.).
- Kaplan, D. 1977: «Demonstratives. An essay on the semantics, logic, metaphysics and epistemology of demonstratives and other indexicals», reprinted in Almog, J. *et al.*, eds., 1989: *Themes from Kaplan* (New York: Oxford University Press).
- Lewis, D. 1986: *On the plurality of worlds* (Oxford: Basil Blackwell).
- _____ 1988: «Rearrangement of particles: reply to Lowe», *Analysis*, 48, 65-72.
- Lowe, E. J. 1988: «The problems of intrinsic change: rejoinder to Lewis», *Analysis*, 48, 72-77.
- Merricks, T. 1994: «Endurance and indiscernibility», *The Journal of Philosophy*, 91, 4, 165-184.
- Myro, G. 1986: «Identity and time», reprinted in Warner, R. *et al.*, eds., 1986: *Philosophical grounds of rationality* (Oxford: Oxford University Press).
- Perry, J. 1972: «Can the self divide?», *The Journal of Philosophy*, 73, 463-488.
- Prior, A. N. 1968: «Change in events and change in things», *Papers on time and tense* (Oxford: Clarendon Press), 1-14.
- Quine, W. V. O. 1960: *Word and object* (Cambridge MA: The MIT Press).
- Quinton, A. M. 1973: *The nature of things* (London: Routledge and Kegan Paul).
- Richard, M. 1981: «Temporalism and eternalism», *Philosophical Studies*, 39, 1-13.
- _____ 1982: «Tense, propositions and meanings», *Philosophical Studies*, 41, 337-351.
- Salmon, N. 1989: «Tense and singular propositions», reprinted in Almog, *et al.* 1989, 331-392.
- Williams, D. C. 1951: «The myth of passage», *The Journal of Philosophy*, 48, 15, 457-472.
- _____ 1953: «On the elements of being», *The Review of Metaphysics*, 7, I (3-18) and II (171-192).

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The Causal Attainment Theory of Temporal Passage

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THE CAUSAL ATTAINMENT THEORY OF TEMPORAL PASSAGE

Brooke Alan Trisel

I. Introduction

The thesis of temporal becoming, wherein events are held to «pass,» «flow,» or «shift» from the future to the present, and then recede into the past, has been systematically dismantled and renounced by many philosophers. Bertrand Russell (1915) and his followers have argued that the notion of temporal becoming has no objective counterpart and, consequently, that it is psychological or illusory.

Despite the formidable problems involved in explicating the way in which time passes, proponents of the temporal becoming theory or «A-theory» resolutely maintain that there is temporal passage of some type and that it is ineradicable.¹ Furthermore, they contend that tensed language is not anomalous or egocentric, but a reflection of the reality of passage.²

In recent years, George Schlesinger (1980) and others have attempted to overcome some of the deficiencies of the temporal becoming theory by interpolating higher orders of time (meta-times or super-times). These attempts have not withstood rigorous scrutiny and thus appear unable to salvage the theory.³

The rival theory to temporal becoming, the so-called becomingless view or «B-theory,» has its merits. However, this theory fails to account for salient aspects of temporality. For these reasons, an alternative way of conceptualizing the experience of temporal passage shall be proposed in this paper.

II. A Critique of the Becoming and Becomingless Views

The becoming and becomingless views have frequently been depicted as being polarized. Thus, it is ironic that these theories have been encumbered and found

¹ See, for example, Lucas (1989) and Markosian (1993).

² See, for example, Harris (1988), p. 20.

³ Schlesinger's proposal has been subjected to penetrating criticism by Oaklander (1984), pp. 70-77.

objectionable for some of the same reasons, namely that they hypostatize events and spatialize time. The passages set forth below epitomize these two views.

In interpreting J. M. E. McTaggart's conception of temporal becoming which is embodied in the A-series, Schlesinger writes:

A typical event ... to begin with is in the distant future; then it becomes situated in the less distant future; it keeps approaching us until it becomes an event occurring in the present. As soon as this happens the event loses its presentness and acquires the property of being in the near past. The degree of its pastness continually increases. (1980, p. 23)⁴

According to Adolf Grünbaum:

Instead of allowing for the transient division of time into the past and future by the shifting Now of experienced time, the theory of relativity conceives of events as simply being and sustaining relations of earlier and later, but not as 'coming *into* being': we conscious organisms then 'come across' them by 'entering' into their absolute future, as it were. And upon experiencing their immediate effects, we regard them as 'taking place' or 'coming into being.' (1963, pp. 318-319)

Events do not approach «us» on the becomingless view. Rather, as indicated, it is consciousness which «comes across» (i.e., comes into awareness of) events. Grünbaum (1963) has argued that Hermann Weyl's well-known statement that consciousness «crawls» upward along an individual's world-line was metaphorical. Accordingly, to explain the ambiguous relationship between consciousness and the four-dimensional manifold, he formulated a theory in which there is a parallelism between physical and mental events.⁵ This dualistic theory has been exhaustively criticized⁶ and hence will not be reviewed here.

At one point in his career, C. D. Broad advanced a theory which affirmed the reality of the past and present but not the future. In an exposition of this theory, Broad asserted: «The sum total of existence is always increasing...» (1952, pp. 66-67) This conclusion is inconsistent with the law of conservation of matter and energy. Also, it has been disputed for various other reasons.⁷ Broad's theory and assertion are noteworthy because they demonstrate how one can be led astray by reifying events.

Broad (1959) later recanted his theory, protesting that it presupposes that the past and present coexist, simultaneously. Not only was Broad's objection well-taken, but also it pertains (as Broad recognized) to the standard, triadic temporal becoming theory. Nonexistent events could not possibly encroach upon the present from the future, nor could they recede into the past from the present. Consequently, if there is temporal

⁴ McTaggart does not explicitly state that events approach «us.» In all other respects, Schlesinger's interpretation closely parallels McTaggart's description (1908, esp. p. 460) of temporal becoming.

⁵ Grünbaum, «The Status of Temporal Becoming,» in Gale (1967), pp. 322-353.

⁶ See Gale (1968), pp. 231-239, Čapek (1976), p. L, and Harris (1988).

⁷ See, for example, Smart (1980), pp. 9-10.

becoming, then past and future events must coexist (simultaneously) with present events.

Grünbaum has vehemently denied the claim made by Milič Čapek (1976) and others that the becomingless view entails that all events coexist, *totum simul*.⁸ Nonetheless, to the extent that all events in relativistic space-time are «written,» «laid out,» or thought of as «simply being,» Čapek's polemic is valid.

J. J. C. Smart (1980), L. Nathan Oaklander, and other B-theorists maintain that there are two senses in which events can be said to «coexist.» In the first sense, which B-theorists disclaim, all events exist at the same time. In the second sense, events coexist (tenselessly) at different times. In advocating this view, Oaklander states: «All events are part of a whole that is related by the temporal relations of *earlier (later) than* and *simultaneous with*.» (1984, p. 228)

If an event of long duration can be divided into micro-events, then one can take the converse approach and aggregate micro-events into a macro-event. For instance, the Civil War is divisible into the various battles of the war or can be conceived of as a single event. Ostensibly, the definition of an event does not hinge on duration. Therefore, *all* the events «earlier than,» «simultaneous with,» and «later than» the Civil War (or any other event) can legitimately be amassed into, and conceptualized as, a singular macro-event. There would be no events earlier or later than an all-inclusive event. *In effect, there would be no B-series.*

As indicated at the outset, some B-theorists have argued that the experience of temporal passage can be discounted. They contend that this pervasive and unrelenting illusion is attributable to the way in which tensed language is used, our increasing stock of memories, or the flow of information through our short-term memories.⁹

Oaklander (1984) is one B-theorist who believes that the different attitudes which people have towards the future and the past are justified. Oaklander also insists that a B-theorist is not bound to disavow the deep-seated impression that time is moving. He has used the following example to account for the experience of temporal movement. At t_1 a man remarks that he is looking forward to his wife's return from vacation (event e) at t_n (in three weeks). A similar type of utterance is made by the individual at t_2 . Oaklander declares:

At t_2 ... the temporal span (duration) between t_2 and t_n is less than the temporal span between t_1 and t_n . Finally, at t_n , the experience of joy occurs (tenselessly) and so does the event e that [the man has] been anticipating at t_1 and t_2 . On this account, the passage of time is reflected in the fact that different ... utterances occur (tenselessly) at different times and at different temporal distances from the time at which event e occurs. (1984, pp. 141-142)

This interpretation of temporal passage is untenable. At t_2 event e has not happened and in fact may not happen. There are many circumstances in which an

⁸ Grünbaum, «The Status of Temporal Becoming,» pp. 338-340.

⁹ For a discussion of these views, see Smart (1980), pp. 11-14.

individual would be unable to return from vacation. Thus, at t_2 it is unjustifiable to claim that there is anything more than a *potential* temporal relation between the utterances and the anticipated event. The duration between the utterances and event e cannot be calculated unless and until the event happens. Analogously, spatial distance cannot be measured without two points.

In a series of integers exhibited on a coordinate line, the distance from two to five is less than the distance from one to five. There is no apparent difference between these spatial distance calculations, which must be regarded as timeless, and the account of temporal passage under consideration.

III. The Meanings of Pass and Near

The words «pass» and «near» have myriad meanings and are used to express spatial and temporal concepts. Insuperable difficulties arise, such as the inability to elucidate the notion of temporal passage, when the spatially related meanings of these words are substituted for the temporal meanings. Accordingly, through a phenomenological and linguistic analysis, an attempt will be made to disentangle the various subtle and interrelated ways in which these two philosophically important words are used.

There is a linearization of time on the becoming and becomings views. On one view, the events which constitute the line flow inexorably from the future to the present whereupon they «pass by» stationary observers (the river of time metaphor). On the variation of the becomings view espoused by Weyl and the physicist James Jeans,¹⁰ consciousness voyages along («passes by») and thereby illuminates different parts of a shadowy, nonflowing river (the «frozen river of time» metaphor).¹¹

When a riverboat or other object «passes by» something, such as the embankment or stationary observers, this is purely incidental to its change of position. Comparably, time cannot «pass by» «us» unless it is in motion. As suggested above, some prominent versions of the becoming and becomings views involve the movement of time or consciousness. Indeed, this is one of the primary reasons why these theories have been fraught with intolerable absurdities and contradictions. There is no temporal motion and consciousness most assuredly cannot move. How, then, are the following perceptions and inferences, and the utterances by which they are conveyed, to be explained?

As wind rustles through the trees and dark clouds appear on the horizon, an individual declares that a rainstorm is «near,» «coming,» or «on its way.» Shortly after this utterance, the person learns that a storm watch has been issued because the «conditions are favorable.» Upon sighting a robin after a harsh winter, a person joyfully proclaims that «spring is near.» An expectant mother remarks that the «time is drawing near» or that the anticipated event is «just around the corner» or «getting close.»

¹⁰ See P. Frank's, «Is the Future Already Here?» in Čapek (1976), pp. 387-395, for discussion and criticism of Jeans' philosophical interpretation of relativity theory.

¹¹ For an elaboration on these metaphors, see Smart (1949) and Gale (1968), p. 230, respectively.

The first example will be used at this point to clarify the relationship between «pass» and «near.» An individual anticipates that it will soon rain on his or her house. As the storm moves towards the house, it may deceive one into believing that the anticipated event is moving from the future and «becoming present.» Furthermore, when the storm clouds «pass over» the house and the rain begins, it buttresses the notion that the event «became present.» Finally, the event may seem to retreat into the past as the storm «passes by» and moves away from the house.

As implied, anticipation and the perception of motion are two factors which reinforce the spurious belief that events pass from the future and move towards «us.» To see that this notion is indeed misconceived, consider what it was that moved. It was the storm clouds that moved, not the anticipated event. More generally, as Smart pointed out, «*things change, events happen.*» (1949, p. 485)

When an event is temporally «near,» this does not mean that there is a short «temporal span» between two events, that a future event has moved closer to the present, or that consciousness has moved closer to an event. In short, the time-related form of «near» is not denotative of spatial distance. However, as represented by the equation for calculating average speed, there is a relationship between distance, time, and speed. For example, when the storm clouds were sixty miles away (position or P_1), they would have been considered spatially distant and the anticipated event would have been thought of as being temporally «distant.» In contrast, the event is considered temporally «near» when the storm is positioned adjacent to or over the house (P_9).

The anticipated event will not happen unless certain conditions are satisfied. One of these necessary conditions is that the storm clouds must be positioned over the house. The storm cannot move from P_1 to P_9 without traversing P_2 to P_8 . As the storm clouds «pass through» these intermediate positions, it is recognized that one of the conditions necessary for the event is being met. With the attainment of a necessary condition, the event would be «nearer» to happening.

To expand upon these thoughts, a familiar example of qualitative change will be employed since it is not as complex as positional change and there is an understanding of the causal mechanics involved in the process. At t_1 a farmer asserts that a particular crop will emerge from the soil (henceforth event A) at t_6 . The conditions which are necessary for event A include nutritive soil, seed, proper temperature, and the correct amount of water.¹² These conditions will be referred to as p , q , r , and s , respectively.

Some of the conditions, such as p , are in place at t_1 . However, other conditions, for example r and s , are unmet at t_1 . As things change (e.g., earth changes its position relative to the sun), there is a correlative attainment of the conditions necessary to cause event A (the effect). Suppose that at t_4 conditions p , q , and r are met. At t_5 all the necessary conditions are met such that they are jointly sufficient for event A . Finally, at t_6 the event happens as was anticipated.

The temporally related utterances, made by an individual in this type of context, reflect the degree of causal attainment. At t_1 the anticipated event is considered

¹² Only four of the conditions which are necessary for event A will be represented.

«distant,» while at t_4 , *after several conditions have been attained*, the event is said to be «near.»

There are instances when a person would not conclude that an event was temporally «near» even though there had been a substantial attainment of the conditions necessary to cause the event. To provide an example, suppose that a large amount of toxic chemical had been inadvertently spilled onto the soil at t_4 . The individual is aware that the seeds were planted in nutritive soil and that the temperature had been conducive to the anticipated event. However, it is also recognized that the chemical may prevent event *A* from happening.

The preceding thoughts can be formalized in the following definition and postulate:

The temporally related locution of «near» means that the conditions which are causally necessary for an event have substantially been met and that there has not been an attainment of condition(s) which would obviate the occurrence of the event.¹³

This postulate raises an epistemological question. In the example cited above, the individual would have had at least a cursory awareness of the degree of causal attainment. However, in the case of an inconspicuous or complicated process, how could one possibly have knowledge that an event is imminent?

By establishing a timekeeping system, thereby allowing comparative change¹⁴ to be measured, inferences can be and are made regarding the degree to which the necessary conditions for an event have been met. For example, in the eighth gestational month, an expectant mother discerns that the event is temporally proximate. This realization is possible even though the individual does not have a direct awareness of the physiological conditions which cause the event. Thus, the conclusion that an event is «near» can be reached without a presupposed and detailed knowledge of causal mechanics.

Recall, in the first example, the person asserted that a rainstorm was «near» based on various evidence such as the position and darkness of clouds. Obviously, opaque clouds are not a necessary condition for rain. However, this condition, since it occurs immediately antecedent to the anticipated event, functions equivalently to a timekeeping device by allowing an estimation to be made of the degree of causal attainment.

An example will help demonstrate the preceding point. Assume that conditions *a*, *b*, and *c* cause event *D* (the anticipated effect). Further, assume that condition *b* is unnoticeable, but that a non-causally related condition *s* invariably or generally occurs

¹³ In regards to those philosophers who maintain that event statements are uninformative, it appears that the postulate could also be expressed in terms of «fact-causation.»

¹⁴ The theory outlined herein is neutral with respect to the question of whether time is absolute or relational. However, because of its simplicity, I support a relational theory of time.

contemporaneously with b . Although b is imperceptible, the degree of causal attainment regarding event D can be ascertained by observing condition s in conjunction with the appreciable necessary conditions.

In denouncing the becomingless view, G. J. Whitrow queries: «If the future history of the universe pre-exists logically in the present, why is it not already present?»¹⁵ Relatedly, Smart (1963) has argued that if pastness, presentness, and futurity are intrinsic properties of events, then it is necessary to explain why events become present at one date and not at some other.

Why does an event happen at one time and not at another? For instance, if event A had occurred at t_{10} instead of at t_6 (the anticipated time), what factors would explain this discrepancy? A-theorists, who also countenance an absolute theory of time, could respond to this question by asserting that time decelerated whereupon there was a concomitant deceleration in the approach of event A from the future. Alternatively, they might conjecture that time, for some impenetrable reason, swept other events into being before event A which resulted in the delay. The first response is patently absurd and the second one is not very illuminating.

Typically, when an event fails to happen, or happens earlier or later than expected, people do not invoke the notion of temporal movement as an explanation. Rather, they appeal (properly) to the idea of physical necessity: a person would likely say that event A happened later than expected because it was «colder than normal» or there was insufficient rain during a particular month. In other words, the event did not happen at t_6 because the conditions at t_5 were causally insufficient for the event.

As argued, the experience of temporal passage can be and, to some extent, is understood in terms of causal principles. This is the first of two postulates which constitute «The Causal Attainment Theory of Temporal Passage» (CAT-TP).

IV. The Hybrid-Series

Since the enunciation of the theory of relativity and the publication of McTaggart's (1908) and Russell's (1915) thought-provoking articles, efforts in the philosophy of time have been primarily directed at resolving the antinomy between the dynamic (A-series) and static (B-series) aspects of time. The A and B-series are inherently flawed in the form in which they were presented and have been refined. However, there are also elements of truth in both of the series. This suggests that a unification of the two series will provide the most viable alternative for relating the notion of temporal passage with the changeless relations of time.

Before a synthesis can be reached, however, it will be necessary to specify and extirpate those components of the A and B-series which are contradictory or extraneous. It will also be necessary to identify the authentic components of the two

¹⁵ Whitrow, «Becoming and the Nature of Time,» in Čapek (1976), p. 530. Originally published in the *Natural Philosophy of Time* (London: Thomas Nelson and Sons, 1961), pp. 288-296. See Gale (1967), p. 353 for a retort from Grünbaum to Whitrow's question.

series. To identify one of the contradictions of the B-theory, we can turn to Broad. Regarding the statement «the Battle of Hastings precedes the Battle of Waterloo by 749 years,» he has written:

Such phraseology would suggest that the two events are two particulars which (a) somehow *coexist* either timelessly or simultaneously, and yet (b) stand timelessly or sempiternally in a certain *temporal* relation of precedence. This must be nonsense...¹⁶

A tenseless statement, such as «the Civil War is earlier than World War I,» gives the misleading impression that the two events have a reality apart from the people who fought the wars. Vestiges (e.g., weapons) of these wars may exist, but there is no Civil War or World War lurking «out there.» The events happened, but they did not exist. It was the continuants, namely the people and armaments, which existed.

There are no events «in the future.» Furthermore, it is erroneous to make the following type of claim: «1970 ... is earlier than 2850.» (Grünbaum 1963, p. 315.) Granted, many of the events of 2850 can be predicted and will likely happen. However, this is radically different from alleging that there is a relation between the events which happened in 1970 and anticipated events. The events of 2850 will happen if, and only if, the conditions necessary for the events are causally sufficient.

There is no event which «is later than» a present event. However, once an event happens, it is then valid to use the following types of modified (tensed) B-series statements: (1) event *X* is happening simultaneous with another event; (2) event *X* is happening later than event *W* happened. Moreover, once event *X* is no longer occurring, one could say: (3) event *X* happened earlier than, simultaneous with, or later than some other event. For instance, it is permanently true that the Civil War «happened earlier than» World War I and that World War I «happened later than» the Civil War. These types of tensed B-series statements are preferable to the tenseless statements since they reflect, not only the unchanging relation between those events which are happening or have happened, but also the nonspatial nature of time.

On the temporal becoming theory, events recede into the «past.» Recent events do seem more immediate than those events which did not happen recently. There is no need, however, to posit metaphysical properties to convey this notion. By using an ordinal scaling method, a «near» and «distant» past can be represented with tensed B-series statements as follows: (1) e_1 occurred earlier than e_2 ; (2) e_1 occurred much earlier than e_5 . In fact, by dating events and thereby establishing an interval scale, this notion is implicitly represented.¹⁷ For example, if events *C* and *D* happened in 1200 and

¹⁶ Broad, «Ostensible Temporality,» in Gale (1967), p. 131. Originally published in *An Examination of McTaggart's Philosophy* (Cambridge: Cambridge University Press, 1938), Vol. II, Pt. I. C. W. K. Mundle has modified Broad's statement in the following way to better reflect the Russellian position: «The Battle of Hastings precedes the Battle of Waterloo and both precede this.» For this statement, see «Broad's Views About Time,» in Schilpp (1959), p. 370.

¹⁷ For a comprehensive discussion of scaling methods, see Torgerson (1958).

1992, respectively, it is, obviously, unnecessary to state that event *C* happened «much earlier than» event *D*.

According to some A-theorists, events acquire and then discard the property of «presentness.» Events do not «come into being» unless they have acquired this strange property. But how can something acquire a property unless it exists? Thus, the argument that «presentness» is a property of events is circular; an event would have to exist «in the future» in order to «come into being.»

There have been numerous unsuccessful attempts to discover a physical basis for temporal becoming. Since events on the temporal becoming theory shift relative to the present, these attempts have typically focused on defining or identifying «the present.» For example, Hans Reichenbach, inspired by quantum mechanics, once defined the present as «the moment at which that which was undetermined becomes determined ...»¹⁸ Grünbaum (1963) and Richard Gale (1968), following in the steps of Hugo Bergmann, have assailed Reichenbach's criterion since it does not single out any one event, in the history of the world, as being «the present.»

There is no property of «presentness» which is intrinsic to events. Hence, no attempt will be made to find a physical basis for «the present.» There is, however, a relationship between when an event happens and a physical criterion. On the necessary and sufficient version of causation, an event happens if, and only if, certain requisite conditions are met.¹⁹ This is a natural limitation which can be utilized to distinguish between potentialities, present events, and the set of events which happened earlier than present events. Before this task is pursued, some clarifying information regarding the necessary and sufficient version of causation will be presented.

Inasmuch as the relation between causes and their effects is symmetrical on the necessary and sufficient version of causation, the theory is incomplete. Consequently, for this analysis, the theory will be and has been coupled with the notion (as is often done) that the difference between a cause and its effect is one of temporal priority. Hereinafter, this theory will be referred to as the «complete necessary and sufficient theory of causation.»

Recall, the reason that event *A* was considered near at t_4 was because a large proportion of the conditions necessary for the event had been met at that time. For this reason, there is a temptation to conclude that event *A* was present (i.e., happening) once the following criterion was satisfied: there was an attainment of the necessary conditions. Conditions *p* through *s* were sufficient for event *A* at t_5 , yet the event did not happen until t_6 . Since the criterion was met before the event had occurred, it is unworkable in association with the complete necessary and sufficient theory of

¹⁸ From Grünbaum (1963), p. 320. Originally published as H. Reichenbach, «Les Fondements Logiques de la Mécanique des Quanta,» *Annales de l'Institut Henri Poincaré*, Vol. XIII (1953), pp. 148-154.

¹⁹ I am indebted to Richard Taylor for his work in the articles entitled «Causation.» See Taylor (1963) and (1967).

causation, where, by definition, cause X is sufficient for effect Y before Y is sufficient for X . Incidentally, this criterion would be feasible if causes occur simultaneously with their effects.

There is a way to define present events based on a physical criterion. Event A happened or was present at t_6 , *a time at which the event was sufficient for its cause*. Based on this criterion, potentialities can be defined as the set of events which have the capacity to occur, and, relative to present events, are insufficient for their causes.

To reconcile the becoming and becomingless views, the residual components of the A and B-series have been reconstructed into a hybrid-series. As alluded to, this trichotomous series includes potentialities, present events, and the set of events which happened earlier than present events. Stated differently, the hybrid-series is an amalgam of the tensed B-series and potentialities.

At this point, it may be advantageous to recapitulate the CAT-TP in terms of the example which has been used throughout this paper. At t_1 event A was a potentiality. At t_4 there was a substantial attainment of the conditions necessary for event A such that it was proclaimed that the event was «near.» Event A happened at a time (t_6) at which it was sufficient for its cause. Once this criterion was met, it could be stated that the effect (event A) «occurred later than» its cause or that the cause «happened earlier than» its effect.

There are significant differences between the hybrid-series and the A and B-series. The hybrid-series is eliminative of the properties «pastness» and «futuraity.» Furthermore, the phrase «present events» differs from the «now» in that it has been divested of its ontological status. The idea of the shifting present, which is the cornerstone of the temporal becoming theory, has been eschewed. It is true that what was perceived yesterday is different from what is being perceived today. This notion, however, reflects nothing more than that there are events which happen (tensely) and are perceptible at different times.

Oaklander embraces the idea that temporal relations are simple entities which belong to the «ontological furniture of the world.» Regarding this premise, he writes: «Such a recognition in turn implies viewing temporal relations as *descriptive* relations; in order for them to obtain between and among events, the events themselves (the relata of the relations) must exist.» (1984, p. 19)²⁰ One reason that B-theorists, such as Oaklander, consider the A-theory impoverished is because the theory must somehow relate nonexistent or possible future events to existent present events. The B-theory is able to avert this problem, but only by spatializing time.

On the hybrid-series, there are temporal relations between present events and the set of events which happened earlier than present events. There is only a potential relation between potentialities and those events which are happening or have happened. However, once an effect is sufficient for its cause, it is assimilated into the network of

²⁰ See Broad, «Ostensible Temporality,» pp. 131-132, for criticism of this way of thinking.

fixed temporal relations. In this way, physical necessity acts as a gatekeeper or mediator between potentialities and the tensed B-series.

As argued previously, the A-theory entails a *totum simul* to the extent that events are thought of as moving towards or away from the present. Also, as suggested above, the types of relations envisaged by B-theorists would not be possible without a *totum simul*. With physical necessity as a gatekeeper to the network of temporal relations, this would explain why every event does not happen at once.

V. A Defense of the Proposed Theory

Causal theories of time integrate ideas from two broad, interconnected, and recondite areas of philosophic thought. As a result, they can be challenged from several angles. The CAT-TP is no exception. Therefore, at this juncture, only a limited defense of the theory shall be undertaken. Some of the potential objections have been addressed in the course of outlining the theory.

Broad argued that motion and qualitative change presuppose becoming.²¹ Similarly, despite Russell's insistence to the contrary, McTaggart (1908) steadfastly maintained that there could be no change without the A-series. These types of arguments have been used against the B-theory and could also be employed against the proposed theory.

In *Scientific Thought*, Broad characterized becoming as a «change of time» as opposed to a «change in time.» A «change of time» means that an event changes with respect to its «A-characteristics.» As intimated in the preceding section, this notion of temporal change is discredited by its circularity. Also, it presupposes that events exist «in the future» and that they are thing-like (i.e., capable of changing qualitatively).

Since there are no A-characteristics, the claim that there are «changes of time» is meaningless. More generally, since the dynamic account of temporal passage has proven to be unintelligible, the argument that the CAT-TP presupposes temporal or absolute becoming is not credible.

Having appreciated the relationship between time and causality in the special theory of relativity, a number of contemporary philosophers, including Reichenbach (1956) and Grünbaum (1963), advanced causal theories of time. Multiple criticisms have been leveled against the causal theory of time.²² The most pernicious objection to the theory is that it is circular. In the Humean regularity theory of causation, as well as in the complete necessary and sufficient theory of causation, causal asymmetry is derived from an underlying, primitive temporal relation. The causal theory of time and its variations are based on the antithetical position. Hence, they are, or at least appear to be, incompatible with the prevailing belief that the sole difference between a cause and its effect is one of temporal precedence.

²¹ See Broad's, «Ostensible Temporality,» p. 124 and «A Reply to My Critics,» in Schilpp (1959), pp. 766-767.

²² See, for example, Smart (1969).

The CAT-TP diverges from the causal theory of time insofar as it is not based on the supposition that temporal order is reducible to causal order. Therefore, the charge of circularity is inapplicable to the proposed theory.

6. Concluding Remarks

The CAT-TP has been propounded as an alternative to the becoming and becomingless views. In this essay, among other things, an attempt has been made to elucidate the meanings of the words «pass» and «near.» The words «approach» and «advance» have also played a central role in the temporal becoming theory; events are held to «approach» the present or «us» from the future. Because of their significance and relationship to «pass» and «near,» these words have also been indirectly scrutinized.

As was discovered with «pass» and «near,» «approach» and «advance» have numerous, interrelated spatial and temporal meanings. The words «approach,» «pass» (passing through), and «advance» can all denote a movement of an object between two spatial positions. This is the meaning which has been illicitly associated with, and thereby tainted, the notion of temporal passage.

The words «approach» and «advance» can also denote accomplishment, achievement, and attainment. This meaning captures the essence of the experience of temporal passage. Accordingly, it has been embodied within the first postulate which can be restated as follows: the temporally related form of the words «near» and «distant» reflect the degree to which the requisite steps have been completed, or the necessary conditions have been met, for an event to happen.

Thus, the impression that events approach the present is explicable without positing nomadic, substantialized events. Moreover, other aspects of the experience of temporal passage, such as the shifting present, can also be explained without the A-series.

The tenseless B-series provides a foundation for temporal relations. However, it is artificial and discordant with the experience of temporal passage. Furthermore, the amassment of all micro-events into a singular macro-event obliterates the tenseless B-series. When the B-series is used conditionally (i.e., it is not used to refer to events later than present events), and is modified to express the nonspatial nature of time, it is veritable.

The first postulate of the CAT-TP symbolizes the experience of becoming, whereby events «approach» from the «future.» The second postulate or hybrid-series concerns the type of temporal structure that is needed to account for this experience in a coherent fashion. More work will be required to test the plausibility of these postulates, although when taken together they appear to provide a reasonable framework for harmonizing the immutable, relational aspects of time with the experience of temporal passage.

REFERENCES

Bennett, Jonathan (1988). *Events and Their Names*. Indianapolis: Hackett Publishing Company.

- Broad, C. D. (1952). *Scientific Thought*. 4th ed. London: Routledge & Kegan Paul.
- Broad's, «Ostensible Temporality,» and «A Reply to My Critics,» in Schilpp (1959).
- Čapek, Milič, ed. (1976). *The Concepts of Space and Time*. Dordrecht, Holland: D. Reidel Publishing Company.
- Gale, Richard M. (1968). *The Language of Time*. London: Routledge and Kegan Paul.
- , ed. (1967). *The Philosophy of Time*. Garden City, N.Y.: Doubleday and Company.
- Grünbaum, Adolf (1963). *Philosophical Problems of Space and Time*. New York: Alfred A Knopf.
- Harris, Errol E. (1988). *The Reality of Time*. Albany: State University of New York Press.
- Lucas, J. R. (1989). *The Future: An Essay on God, Temporality and Truth*. Oxford: Basil Blackwell Ltd.
- Markosian, Ned (1993). «How Fast Does Time Pass?» *Philosophy and Phenomenological Research*, 53, 829-844.
- McTaggart, J. M. E. (1908). «The Unreality of Time.» *Mind*, 68, 457-474.
- Oaklander, L. Nathan (1984). *Temporal Relations and Temporal Becoming: A Defense of a Russellian Theory of Time*. Lanham, MD.: University Press of America.
- Reichenbach, Hans (1956). *The Direction of Time*. Ed. Maria Reichenbach. Berkeley: University of California Press.
- Russell, Bertrand (1915). «On the Experience of Time.» *The Monist*, 25, 212-233.
- Schilpp, Paul. A., ed. (1959). *The Philosophy of C. D. Broad*. New York: Tudor Publishing Company.
- Schlesinger, George N. (1980). *Aspects of Time*. Indianapolis: Hackett Publishing Company.
- Smart, J. J. C. (1949). «The River of Time.» *Mind*, 58, 483-494.
- . (1963). *Philosophy and Scientific Realism*. New York: The Humanities Press.
- . (1969). «Causal Theories of Time.» *The Monist*, 53, 385-95.
- . (1980). «Time and Becoming» in Peter Van Inwagen, ed., *Time and Cause*. Dordrecht, Holland: D. Reidel Publishing Company, pp. 3-15.
- Sosa, Ernest (1979). «The Status of Becoming: What is Happening Now?» *The Journal of Philosophy*, 76, 26-42.
- Taylor, Richard (1963). «Causation.» *The Monist*, 47, 287-313.
- Taylor, Richard (1967). «Causation» in Paul Edwards, ed., *The Encyclopedia of Philosophy*. Vol. 2, New York: Macmillan Publishing Co., Inc. & The Free Press, 8 vols.

Torgerson, Warren S. (1958). *Theory and Methods of Scaling*. New York: John Wiley & Sons, Inc.

Williams, D. C. (1951). «The Myth of Passage.» *Journal of Philosophy*, 48, 457-472.

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Hereafter, in a Later World than This?

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HEREAFTER, IN A LATER WORLD THAN THIS?

PETER J. KING

The framework of possible worlds has become one of the most useful tools available to philosophers — including those who allow them no ontological status, only a heuristic rôle. Even such a sceptical user, however, must be careful when using the language of possible worlds; even the staunchest modal anti-realist must treat worlds *as though* they were real. As a heuristic device, possible worlds only function if one treats them as genuine worlds, distinguished from ours in certain ways. If they're not treated seriously, with due care and attention, then there is a danger that one won't be using the notion of possible worlds at all, but some other, ill-defined notion. One area of frequent misuse concerns the rôle of time, and it is with this that I shall be concerned here.

Transworld Temporality

Many philosophers have been guilty of talking as if possible worlds were temporally related to each other.¹ For example, in a discussion of the counterfactual analysis of causation Jonathan Bennett makes such an assumption, at one point writing:

If event *e* occurs at world *W* at a certain time, and *e** occurs at *W** *at the same time*, it may well be that each has the other as a counterpart. ([1], p.384; my italics)

Of course, not all references to times at worlds involve this error. Peter van Inwagen, for example, discussing the issue of genuine contra-causal free will, writes:

there are possible worlds in which things were absolutely identical in every respect with the way they are in the actual world up to the moment at which [a thief decides not to steal...] and in which he takes the money. ([4], p.128)

Here there is no commitment to the notion that an event at one world occurs at the same time as an event at another, only a reference to comparable temporal series of

¹ Quantum-theoretical, branching worlds would of course be temporally related to each other; however, such worlds would not be merely possible in the sense needed for a philosophical account of modality. I shall discuss branching possibilities later in this paper.

events at different worlds (I shall have more to say later about this sort of innocent talk of worlds and times).

Now even in cases such as that of Bennett, the sin is generally venial; it leads to no serious philosophical errors, and what the writers are saying could often still be expressed in possible-worlds terms without the offending notion (as in the van Inwagen example). The possible-worlds enthusiast clicks the tongue in mild annoyance and passes on. Occasionally, however, the issue of transworld temporality is at the heart of things, as for example in a discussion of time by John Bigelow [3]. In order to defend the reality of time against McTaggart and his modern followers, Bigelow appeals to temporal relations between possible worlds. His approach depends upon there being ‘a series of worlds, each containing the same things, and differing only in which of those things are past, which are present, and which are future.’ ([3], p.11) He represents such worlds by sequences of letters, thus:

abcdefghijklmnopklmnopqrstuvwxyz

abcdefghijklmnopklmnopqrstuvwxyz

abcdefghijklmnopklmnopqrstuvwxyz ([3], p.14)

Capitals represent present events, boldface past events, and italics future events. Thus, at the first world, event l is in the future, at the second world it is in the present, while at the third world it is in the past. The details of Bigelow’s use of this schema don’t concern me here, though it will be useful to offer one other example of the way he talks about worlds in terms of inter-temporality:

I will assume [...] that if a thing *a* is present in world *w*, then there is a world in *w*’s past for which *a* is future, and there is a world in *w*’s future for which *a* is past. ([3], p.13)

Here we see explicit talk of worlds and their contents existing in each other’s past and future. Now, I have argued in [5] that it is not possible to use spatiotemporal isolation as a criterion for the distinctness of possible worlds (because it is possible for there to be two or more spatially distinct spatial regions or two or more temporally distinct temporal regions of a single world). Nevertheless, although it is not a sufficient condition on possible worlds that they be spatiotemporally isolated, it must remain a necessary condition; any thing, any event that is related to me either in space or in time is not a mere possibility, but is actual, is part of my world.

This might seem odd, especially with regard to time, for don’t we talk about possibilities in our pasts and futures? When I say, for example, that England might win the Ashes next time, I’m surely talking about a possible event in the future, so if I’m to capture that in possible-worlds talk, I shall have to talk about worlds at which England win the Ashes *in the future*. If possible worlds aren’t temporally related to each other, then so much the worse for possible worlds — they clearly aren’t up to the job.

The example from van Inwagen, which I quoted above, indicates the direction of my response: possibilities are not temporally related to us, though they can relate to, or refer to, our past, present, and future. At the moment, for example, talk of England winning the Ashes concerns the future; after the event, that same possibility will concern the past. That is, the possibility is not now *in the future* – it is not a future possibility –

it is *about* the future. In possible-worlds terms, whether I raise the possibility of England winning the Ashes before or after the event, I'm referring to the same possible world,² not to one world at which the Ashes series is in the past and to another at which it's in the future.

Bigelow, however, is concerned with a slightly different sort of claim: 'What is actually present could have been future and could have been past.' ([3], p.9) Assuming for the sake of argument that these are genuine possibilities, do such claims demand temporal relations between possible worlds? No; if *e* is a present event in our world, then the possibility that it have been a future event can be analysed as follows: in the actual world, *e* occurs at the same time as events *f*, *g*, *h*, ... *n*, and there is a possible world in which *e*'s counterpart, *e'*, occurs later than *f'*, *g'*, *h'*, ... *n'* (and the same, *mutatis mutandis*, for the possibility that *e* have been past). Those who favour transworld identity can omit the term 'counterpart', etc.

In fact Bigelow would reject this analysis, because it depends upon presentness being defined relative to other events; he argues that one can define *e*'s property of being present as intrinsic to the pair, *e* and a frame of reference:

Within a frame of reference, some things are present and others are not, and their possession of this property of presentness relative to the frame of reference need not be construed as simply their being simultaneous with some contextually supplied *further* entity. ([3], p.8)

I have something of a problem with this, in so far as I have no idea how to make sense of it. However, I think that my alternative approach can be applied to it: present event *e* could have been future in that, in the actual world, *e* is present relative to frame of reference *F*, and there is a possible world in which *e'* is future relative to *F'*.

Branching Worlds

It might be objected that my criticism of writers such as Bigelow ignores an important alternative approach to possible worlds — the *branching*-world account. Well, on the one hand, most if not all philosophers who talk of branching possibilities have something like the following in mind: «One is given, let's say, a previous history of the world up to a certain time, and from that time it diverges considerably from the actual course.» (Kripke [6], p.113) This possibility is represented by two possible worlds whose histories match exactly up to time *t* in one world and time *t'* in the other, but which differ after those times. That is, it's not the possible worlds which branch but the possible histories that such worlds represent. To refer to this sort of position as a branching-world model would therefore be misleading.

Might it be argued, on the other hand, that it's the world itself which does the branching, each branch representing a different possibility? In other words, different worlds would share an initial segment ('overlapping worlds' as David Lewis calls them in [8]). I find such a view unintuitive, to say the least. First, it means that we have multiple futures, each having the same status; the many different possible outcomes of the

² In fact, of course, I'm referring to the set of those possible worlds that include the situation with which I'm concerned (England's winning the Ashes), and which are close enough to the actual world to be of interest to me.

next Boat Race, for example, are all equally part of the future, so that wondering which of them will occur is pointless — they all will. Thus, as Lewis concludes: «Branching, and the limited overlap it requires, are to be rejected as making nonsense of the way we take ourselves to be related to our futures» (Lewis [8], p.208).

Secondly, on a branching-world model, how are we to distinguish between the possibility that the Everett interpretation of quantum theory, with its branching world, is correct, and the possibility that it isn't? Indeed, how are we to distinguish between Everett-branches and merely possible branches? As I argued above, spatiotemporal (and causal) isolation is a necessary (though not a sufficient) condition for something to be another possible world rather than a part of our world. Everett-branches don't meet this criterion, so are part of our world, but no branching worlds could meet the criterion; if England do win the Ashes, for example, the possibility that Australia win them is still in my future, is spatiotemporally and causally related to the present, and spatiotemporally related to all the other possible outcomes.

Indistinguishable Worlds

Bigelow's diagram of the three worlds is curious in another respect; it suggests that the worlds represented are identical except for their temporal relationships with each other. That is, his diagram should look something like this:

w_1	abcdefghijklmnopqrstuvwxy
w_2	abcdefghijklmnopqrstuvwxy
w_3	abcdefghijklmnopqrstuvwxy

If our world is w_2 , and event m is in our present, we can on this picture say that m is in the past at w_1 and in the future at w_3 . But, as I've argued, nowhere in the picture (or out of it) is there an extra-worldly or meta-worldly scale against which the three worlds' temporal relationship is measured. Without such a scale, we're left with three identical worlds — and even if Bigelow is happy with the notion of distinct but indistinguishable worlds (as I am not), they surely can't do the job that he requires of them.

In the Leibniz-Clarke debate over the notion of absolute time, Leibniz makes substantially the same point, complaining also that the existence of such indistinguishable possible worlds would offend against his Principle of Sufficient Reason — what reason could god have for choosing to actualise one rather than another? (See [7] L.III.5–6.)

Conclusions

I've argued that Bigelow is wrong to talk of possible worlds as being temporally related — but does it matter? After all, I've already admitted that such talk can be harmless, being easily recastable in acceptable terms. Well so it can, but not in cases like this. Bigelow's concern is to counter McTaggart's argument that time is unreal; he calls upon possible worlds in an attempt to show that McTaggart's B-series (the *earlier/later* series) can be defined in terms of the A-series (the *past/present/future* series). However, unless possible worlds are temporally related, both the A-series and the B-series make sense only at worlds; they cannot be applied over worlds. There can, therefore, be no definition of the B-series in terms of the A-series, and McTaggart's argument remains to be refuted. (My

own view is that taking possible worlds seriously leads one to accept McTaggart's position, but arguing for that would go well beyond the aims that I've set myself here.) Bigelow's arguments fail because he has fallen into the trap of using possible-worlds talk without taking sufficient care to treat possible worlds genuinely as worlds.

Of course, Bigelow isn't a modal realist, but a combinatorialist; he analyses possible worlds in terms of combinations of orderings of individuals, properties, and relations (see, for example, [2]), so am I fair to demand that he take into account the sort of Lewisian realist talk about possible worlds upon which I seem to have been relying? Well, it's difficult to see how Bigelow's combinatorialist position can make any more room than modal realism can for the notion of worlds distinguishable only (or even primarily) by their temporal relationships to each other. Indeed, whatever ontological theory of possible worlds one adopts, two of the constraints upon it must be: first, that when we're *using*, rather than analysing, possible-world language, we talk about possible worlds as if they were genuinely worlds, and secondly, that such talk make sense of our normal modal intuitions, as far as possible. (There is some leeway with regard to the latter constraint, if only because one of the benefits of possible worlds is that they can help us to spot inconsistencies and confusions in our modal intuitions.)

The same goes even for the user of possible-worlds language who acknowledges no ontological commitment, regarding such language as no more than a useful device for talking and thinking more clearly about possibility and necessity. We need only ask such a person if she considers it possible that our space-time be shifted a minute forwards or backwards; unless she has some notion of a greater space-time against which ours can be measured, then the notion makes no sense — and neither, I submit, does Bigelow's notion of relatively temporally shifted worlds.³

References

- [1] Jonathan Bennett, 'Event Causation: the Counterfactual Analysis', in James E. Tomberlin [ed.] *Philosophical Perspectives, 1: Metaphysics, 1987* (1987, Ridgeview Publishing Co.)
- [2] John Bigelow, 'Real Possibilities', *Philosophical Studies*, 53 (1988) 37–64
- [3] John Bigelow, 'Worlds Enough for Time', *Noûs* 45 (1991) 1–20
- [4] Peter van Inwagen, *An Essay on Free Will* (1983, Oxford University Press)
- [5] Peter J. King, 'Other Times', *Australasian Journal of Philosophy* 73:4 (1995) 532–547
- [6] Saul Kripke, *Naming and Necessity* (1980, Basil Blackwell)
- [7] G.W. Leibniz & Samuel Clarke, *The Leibniz–Clarke Correspondence*, ed. H.G. Alexander (1976, Manchester University Press)
- [8] David Lewis, *On the Plurality of Worlds* (1986, Basil Blackwell).

³ I should like to thank Dorothy Edgington for her comments on an earlier draft of this paper.

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which is the only file within the archives: **sori10wp.zip**, **sori10wp.arj**, **sori10wp.gz**, etc. A print-file (**sorite10.ps**), also released, and generated from the file **sorite10.wp** can be found in the archive **sori10ps.zip** and printed with a PostScript printer.

Two whole «doc» versions of this issue of *SORITES* are provided, but they cannot truly or faithfully reflect the official WordPerfect 5.1 version, departing as they do from the authorized WP 5.1 document — in a more or less severe way, depending on the particular case. One of them, **sorite10.wp.html** (or its equivalent, **sorite10.htm**), is an hypertext HTML version chiefly destined to be displayed at the InterNet Web and viewed with http browsers. The other, **sorite10.txt**, is an impoverished version, with only ASCII symbols <Alt-32> through <Alt-126> being used, and a CR at the end of each line. Those two versions are archived, respectively, as **sor10htm.zip** and **sor10txt.zip**.

Several of those files are made available in MIME (Base64), UUenCODed (.UUE) and BinHexed (.HQX) translations, in order for them to be attached to e-mail messages.

Although each version, whether official or not — as initially released today (19 May 1999) by the **SORITES** team — is an entire seamless file, it may be splitted down into chunks in order to facilitate downloading, browsing, transferring or e-mailing. In such cases, the unity of this issue of **SORITES** as a whole must be preserved by keeping the ensuing collection intact.