

## PUTTING THE WORLD BACK INTO SEMANTICS<sup>1</sup>

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### 1. *Carving up the Great Fact*

What follows is a defence of what is at root a correspondence theory of truth for sentences with empirical content. Two extreme positions can be distinguished in regard to what it is in reality to which such sentences correspond.<sup>2</sup> At the one extreme is the position of those, such as Davidson, who accept the so-called ‘slingshot argument’ as demonstrating that there is at most one all-embracing entity, the Great Fact, to which all true sentences correspond.<sup>3</sup> At the other extreme is the position, defended for example by the authors of “Truth-Makers”<sup>4</sup>, which sees correspondence for empirical sentences as pertaining to the *verbs* of such sentences, so that the job of making true is carried out by individual *states* or *events*. Interestingly, Davidson too seems in some passages to embrace this latter option. Thus for example he asserts that:

it is the whiteness of snow that *makes* ‘Schnee ist weiß’ true (1984, p. xiv),  
each of these sentences [‘I am writing my name’, ‘I am writing my name on a piece of paper’, etc.] is made true by the same action (1980, p. 110),  
[a certain flight] makes it true [that Amundsen flew to the North Pole]

1. The present paper is based on a talk presented at the Eastern Division meeting of the American Philosophical Association in 1988. I am grateful to Prof. Davidson who chaired the session, as also to Ernest LePore, who served as commentator. Thanks are due further to Johannes Brandl, Alex Burri, Roberto Casati, Cynthia Macdonald, Kevin Mulligan, Jean Petitot and Graham White for helpful comments, and also to the Swiss National Foundation, under whose auspices the work on this paper was completed.

2. For more details as to the spectrum of available positions here, see my 1989.

3. See Davidson 1984, p. 37ff.

4. See Mulligan, Simons and Smith 1984.

(cf. 1980, p. 117),

the same event may make 'Jones apologized' and 'Jones said "I apologize"' true (1980, p. 170).

Officially, however, Davidson remains of the opinion that attempts to pursue the idea of making true must lead back to the Great Fact. This opinion might gain support also from surely worthy attempts – for sentences with empirical content – to identify *making true* with *causing to be true*. For if, as quantum theory seems on some interpretations to tell us, no part of the universe is causally separable from any other, then from this perspective, too, the only acceptable candidate truth-maker (truth-causer) for empirical sentences might turn out to be something like the universe as a whole. The fact, however, that Davidson in another guise also accepts identity of causes and effects as his criterion for identity of events, might be taken to imply that he himself has pressing reasons for considering ways in which the Great *Causal* Fact might be cloven apart.

What follows, here, amounts to a first rough tally of such cleavings, or in other words an investigation of how one might cleave truth-makers for true empirical sentences from out of the totality of what causes such sentences to be true (in the widest sense of 'cause'). The position defended will lie somewhere between the two extremes just mentioned, and it will, I believe, embody some of the advantages of each.

## 2. Truth-Makers

The paper "Truth-Makers" argued in favour of four theses:

- (i) that a non-trivial theory of truth-makers is not merely possible but is in fact required as a necessary supplement to a classical Tarskian theory of truth if such a theory is to be illuminatingly applied to logically simple sentences about reality,
- (ii) that there are strong reasons for admitting events as individuals into our ontology, in addition to semantic reasons of the sort canvassed by Davidson: thus events can be *perceived, remembered, etc.*, in many cases independently of the substances which are their bearers, and in ways which imply that otherwise tempting reductions of event-talk to substance-

talk are ruled out;

- (iii) that these same reasons must sanction also the admission into our ontology of individual *states* (of whiteness, happiness, etc.),
- (iv) that, insofar as our empirical, logically simple sentences about the spatio-temporal world are concerned, it is *events* and *states* as individual denizens of reality that have the job of making true.

The paper defended on this basis the idea that truth itself, at least for the given class of sentences, ought to be seen as a relation (of correspondence) between a sentence (or utterance, or sentence-at-a-time<sup>5</sup>), and the event or state that makes it true. A view of this sort has, we argued, a number of advantages, not least in that it goes a long way to providing an account of the nature of truth for sentences with empirical content in a way that involves no appeal to abstract entities such as sets, properties, propositions, or what one will. And it saves a powerful pre-theoretic intuition to the effect that, say, the tallest Finnish spy, or Ronald Reagan, is not involved in making true the sentence that I now (sitting here in Schaan) have a headache. Intuitively, the boundary around the truth-maker for this sentence has to be tight enough to exclude bits of Finland while including bits of my head. What we need, then, or so I shall argue, is a theory of truth-makers as locally bounded entities, a theory running in tandem with the theory of events and states.

(i), (ii) and (iii) still seem to me to be perfectly acceptable. Thus it still seems to me that truth-maker theory is the right path to follow in coming to an understanding of the principal ways in which we lock into reality via sentence-using acts, and that the investigation of *events and states as individuals* will be indispensable to this undertaking. As regards (iv), however, I have become gradually less convinced of the rightness of supposing that events and states taken alone (broadly: verb-shaped entities or 'tropes' or 'moments') can count as truth-makers in the sense required.

5. Here, as there, the question of the nature of truth-(value)-bearers is not at issue. One can perfectly well, for our present purposes, go along with Davidson's account e.g. at 1984, pp. 34, 43f., though in the long run it would be necessary to specify more precisely what a 'sentence' is.

### 3. *Real Semantics*

It is the glory of Tarski-style semantics that it tells us how to understand the truth-behaviour of logically compound sentences in terms of a prior understanding of the truth-behaviour of logically simpler sentences from out of which they are constructed.<sup>6</sup> This semantics at the same time offers us little help in arriving at this prior understanding, for its theory of truth is designed to work in just the same way for all (appropriately formalized) sentences, including sentences about mathematical objects and other abstracta.<sup>7</sup> Indeed there is a sense in which it turns away from objects in reality entirely, devoting its attentions instead to abstract set-theoretical models wherein objects figure only in denatured form, which is to say only insofar as they serve as *Urelemente* of the relevant sets. The upshot of this, however, is that truth itself is the same kind of (anodyne) relation for both mathematical and empirical sentences: a relation between sentences and sets.

Standard semantics operates, we might say, on a level that is one step removed from each specific sort of object or field of objects with which our sentences may deal. This is in spite of the fact that already in logic one is dissatisfied with model theories which are derived merely from algebraic constructions and do not in addition have some sort of link to a reality beyond the syntax. (Compare, in this respect, the case of quantum logic, whose motivation was entirely syntactic.) Here I want to dig that one extra level deeper, and to provide the outlines of a theory of truth for sentences with

6. A sentence will be taken as logically simple, for present purposes, if: (1) it contains no terms introduced by definitions which involve logical constants, (2) it cannot be decomposed into one or more further constituent sentences by deletion of logical constants, and (3) it contains no semantic terms such as 'about', 'refers', 'truth', 'means', etc. On problems with the notion of logical simplicity see "Truth-Makers", §§ 3-4.

7. The problem here is exacerbated by the fact that classical semantics takes it for granted that truth and falsity are to be treated simply as alternative values of value-bearers which are in themselves intrinsically neutral. There are however strong reasons for calling into question the assumption that it is necessary to treat the falsity (of sentences, beliefs, judgements) as if it were on a par with truth. See e.g. Millikan 1986, pp. 7, 17, 88.

empirical content, conscious that this will mean a sacrifice of generality in the resulting account of truth (though of course orthodox Tarskians, too, must make a similar sort of sacrifice in leaving out of account in their theory of truth sentences – for example about truth and satisfaction – of a sort that would otherwise render their theory paradoxical). In return, however, we shall require that the desired account should have greater powers in elucidating the detailed truth-behaviour of the sentences to which it applies than are available on the basis of the more usual, anodyne approach.

The Tarskian machinery does, certainly, lend itself well to extensions of certain sorts, as is illustrated most notably in the case of possible-world semantics. Objects in reality, however, enjoy whole batteries of spatial, temporal, topological and mereological properties and relations, properties which are simply not mapped by the standard set-theoretic models of classical semantics and its extensions. Many of these features are reflected systematically in corresponding grammatical features of our natural languages.<sup>8</sup> Can we, then, incorporate features of the given sorts in our accounts of how these sentences are made true? Experiments in this direction have been made already by semantic theorists whose sensitivity to the peculiarities of natural languages has been influenced by work in linguistics. Thus mereological ideas have been incorporated into semantic theories designed to cope with the difficulties with sentences involving mass terms.<sup>9</sup> Semantic treatments of the phenomena of tense and aspect, similarly, have in some cases profited from the exploitation of special structure-building principles which fall outside the idealizing purview of standard semantics. What I shall suggest in what follows, now, is that it is possible similarly to exploit certain structural properties of events and states in ways which make for greater realism in our theory of truth.

8. See Talmy 1988 and 1988a, and compare McCawley (1985, pp. 179f.), who points out that the neglect of the peculiarities of mass terms and of the ways in which the objects described by our sentences may variously overlap is a central inadequacy of the unquestioned orthodoxy that has governed post-Russellian philosophical logic.

Note that, in spite of Davidson's assumption that one could extend the Tarskian machinery more or less without limit, the mentioned features fall outside the purview of what can be achieved by standard set-theoretic means.

9. See e.g. Bunt 1979.

#### 4. Correspondence vs. Similarity

The problem facing all proponents of a correspondence theory of truth is that there is no obvious similarity between sentences on the one hand and objects – such as people, meadows, clouds, etc. – on the other. Logic and ontology deal, it is clear, with quite different kinds of structures. The most important difference in this respect is captured in the following principle:

(SUPERORDINACY) If  $a$  makes  $p$  true, then every  $b$  which includes  $a$  as part (every superordinate whole) is also such as to make  $p$  true.

This principle seems to follow immediately from the idea that a truth-maker is a segment of reality, and is in keeping with the mereological framework that truth-maker theory demands. Suppose, for example, that Mary asserts truly that John's head aches; then it seems that we have an indefinite number of truth-makers for the sentence in question. For it is clear that if some given phase of John's headache (in consort with other entities) makes Mary's assertion true, then so does every similar whole formed from any circumcluding phase. It might be objected that (SUPERORDINACY) has problems with indexicals. Consider a sentence like 'There are two persons here.' This sentence is made true even by larger regions of reality involving more than two persons, however, because the reference (or reference-delineating power) of 'here' is fixed independently of truth-making region.

Note that one consequence of the (SUPERORDINACY) principle is that the world as a whole, since it contains all other candidate truth-makers as parts, would serve to make all (true, empirical) sentences true.

We shall return to this issue of maximal truth-makers once again below. For the moment we must concern ourselves with the question of minimal truth-makers. Can we truly accept, for example, that 'John kissed Mary', if it is true, is made true exclusively by some particular kissing event; that 'John is angry' is made true exclusively by some particular state of anger; that 'Mary is smiling' is made true exclusively by some particular smiling; and so on? Or is it not much

rather the case that, if 'John kisses Mary' is true, then John himself is part of that which makes this sentence true? In what follows, at all events, we shall pursue the consequences of this latter idea, an idea which might be captured by the following principle:

(PARTS) if  $a$  makes  $p$  true, then  $a$  includes as parts all those objects to which reference is made in  $p$ .<sup>10</sup>

Here 'object' is to be understood broadly enough to include not only things and events, but also masses of stuff, processes, individual states and qualities, etc. (so that verbs, too, have objects as their correlates).

It would be tempting, as a means of blocking the globalization of single truth-maker to Great Fact, to reformulate the given principle in such a way that all and only those objects to which reference is made in  $p$  are comprehended as parts within the relevant truth-maker. A move of this sort, however, even if it could be carried out in a way that is consistent with the (SUPERORDINACY) principle, would be too strong, as the pervasive phenomenon of enthymematic uses of language makes clear. What is needed, briefly, is a restriction to: all and only those objects  $a_1, \dots, a_k$  to which explicit reference is made in  $p$ , together with those further objects upon which the  $a_i$  depend for their existence – an idea which will be developed in more detail in what follows.

The principle (PARTS) has problems of other sorts, however. Above all one would need to cater for the fact that reference may be either singular (as in the case of proper names), or generic (as in the case of some common names and also some verbs). On the other hand, however, since we are interested in the question as to what it is in reality to which true sentences correspond, this generic reference cannot be taken, as on most popular accounts, in the sense of reference to abstracta (to properties, ideal essences, or what have you). For then the question would still be left open as to what the regions of concrete individual reality are to which these abstracta correspond. Making the appropriate sense of 'reference' explicit,

10. Compare the notion of a 'topic semantics', for example as sketched in Dunn 1976. See also my 1991, p. 53f.

(PARTS) might accordingly be reformulated as:

(PARTS\*) if  $a$  makes  $p$  true then  $a$  comprehends as parts at least (a) all those individual objects to which singular reference is made in  $p$  and (b) individual instances of all those sorts of objects to which generic reference is made in  $p$ .

Thus if 'Camille takes tea with Marianne' is true, then some tea is involved in making it true, together also with some taking of tea; thus any truth-maker of the given sentence includes at least: Camille, Marianne, some tea, some taking of tea.

The principle still requires a lot of work, however. Thus it faces a thicket of difficulties as a result of the problems raised by trans-temporal wholes. Suppose the tea-taking in question can be described truly also by means of the sentence:

Napoleon's great-great-granddaughter takes tea with Lenin's secretary's niece.

The principle (PARTS\*) tells us (rightly) that Napoleon and Lenin are involved in making true the given sentence. Someone might object to this outcome that it is surely wrong to suppose that the linguistic structure of an expression must be mirrored so exactly in the ontological structure of the things referred to in it. If John is the father of Jim, and is referred to as such, then this clearly does not mean that John is somehow composed of his son. Closer attention reveals however that the principle (PARTS\*) does not imply such an illegitimate imputation of structure. Camille's being referred to as Napoleon's great-great-granddaughter leaves *her* entirely as she is. Merely: the sentence through which this reference is effected trawls more widely through reality than does the sentence in which she is referred to simply by name (so that different parts of reality are after all involved in making true the given sentences). Similarly if we affirm on one occasion that

John imitated Otto (namely in that he shot himself in the heart)

and on another occasion that

John shot himself in the heart,

then it is the same event that is described in these two sentences, but a different truth-maker is involved in each case, since Otto is not involved in making true the latter sentence. Or consider Davidson's own example: 'Red Bluff is further south than Naples' and: 'Red Bluff is further south than the largest Italian city within 30 miles of Ischia.' (1984, p. 42) Ischia, I want to claim, is involved in making true the latter, but not the former, sentence.

##### 5. *Truth-Makers as Dependence-Structures*

Let us suppose that (PARTS\*) can be formulated in a suitably rigorous fashion. Then it is important to insist once again that among the objects comprehended by truth-makers for sentences with empirical content will be included not merely events (of kissing, buttering, moving) but also qualitative and quantitative states (of John's being six feet tall, Mary's being pregnant, Sam's being jealous, etc., together with that massy, scattered, vast, individual expanse of colour which we call the whiteness of snow). This lumping together of events and states is by no means arbitrary. The characteristic feature of both sorts of entities is that they are in every case one-sidedly dependent on the substances in which (in Aristotelian jargon) they inhere. All events and states are further individuals located in time and space. Some events and states are moreover dependent on a plurality of substances;<sup>11</sup> they are, in other words, relational in nature (a feature not countenanced by Aristotle), and an even more ambitious generalization, hazarded neither by Aristotle nor by Davidson and other modern event-ontologists, recognizes higher-order events and states which are dependent upon other events and states as their bearers in just the way that first-order events and states are dependent on substances of a common or garden sort. Thus consider the sentence:

11. Consider for example hits and kisses, flyings and apologizings, states of jealousy and bonds of wedlock.

The clumsiness of John's buttering of the toast was more painful to Mary than was the jarringness of the noise he made sharpening the knife.

A truth-maker for this sentence must involve, it seems, at least the following:

- (a) John
- (b) Mary
- (c) a knife
- (d) some butter
- (e) some toast
- (f) a buttering (first-order event dependent upon John, perhaps also on the knife)
- (g) a clumsiness (second-order state dependent upon the buttering)
- (h) a sharpening (first-order event dependent upon John and the knife)
- (i) a noise (second-order event dependent upon the sharpening)
- (j) a jarringness (third-order state dependent upon the noise and upon Mary)
- (k) two painfulnesses (fourth-order states dependent, respectively, on the jarringness and on the clumsiness; these stand – we might suppose – in an internal relation of difference-intensity).

A theory which admits higher-order events and states along the lines suggested can cope with inferences like that from 'John's clumsiness annoyed Mary' to 'Something annoyed Mary'. And lest the reader think that higher-order events and states are creatures at home only in intentional contexts (are creatures of the mind), consider the case of resistors in a circuit which are sensitive to sudden changes in level of current. 'The sudden increase in the current in the conductor caused the resistors to become unstable' entails 'Something caused the resistors to become unstable' (namely a second-order event in the sense at issue here).

Consider, now, the two sentences: 'John is approaching Manchester' and 'John is moving', assumed to be true in virtue of the same

event. Yet still, we can naturally distinguish two distinct truth-makers, in only one of which is Manchester involved. And similarly in the case of 'John is thinking about Mary' and 'John is undergoing a C-neuron firing'. Here again we might properly want to say that these two sentences have the same event as truth-maker. On our present theory, however, we may be able to do justice to the idea that the truth-maker of 'John is thinking about Mary' involves Mary in a way that the truth-maker of 'John is undergoing a C-neuron firing' does not, while again retaining the thesis that there is only one *event* involved.

What then are truth-makers for empirical sentences? Broadly, they are entities built up via dependence-relations out of the families of objects which result when the principle (PARTS\*) is applied to sentences of the given sorts.<sup>12</sup> Such wholes will be referred to in what follows as dependence-structures, since what gives them unity is precisely the system of dependence relations between the entities involved. In a dependence-structure objects fit into one another like the links of a chain. This suggests a final reformulation of (PARTS) to:

(PARTS\*\*): if *a* makes *p* true then *a* comprehends as parts at least (a) all those individual objects to which singular reference is made in *p* and (b) individual instances of all those sorts of objects to which generic reference is made in *p*. Moreover (c) *a* has a structure reflecting the dependence relations between its various parts or members.

## 6. Events

On the view suggested, therefore, it is registered within the locus of the truth-maker itself precisely how its parts are fitted or linked together (something which could not be the case if the truth-maker were a set or a simple whole in the sense of Leśniewski's extensional mereology). On the Davidsonian approach, in contrast, these matters are to be catered for via considerations of adicity. Thus 'boil'

12. For further details see my 1987, p. 214ff.

and 'fly' are treated semantically as two-term predicates; the former correlates to a relation between a boiling-event and an object that boils, the latter to a relation between a flying-event and an object that flies. The predicates in question are dyadic, Davidson argues, because, while 'Chloe boiled the lobster' entails 'The lobster boiled', 'The lobster boiled' does not entail 'Someone or something boiled the lobster'. Similarly 'x flew' does not entail that someone or something was the controlling agent of the flying. The predicates underlying 'sing' and 'run', too, are to be treated as dyadic, though now as relations between events and agents. As Davidson remarks, 'One may run without running anywhere, and sing without singing anything. But there is no singing without a singer.' (1985, p. 232) Events like apologies, on the other hand, are seen by Davidson as requiring both an agent and a receiver, and are accordingly symbolized by three-place predicates relating agent apologizers to patient apologizees.<sup>13</sup> The principles which decide matters here, according to Davidson, are as follows:

to determine the logical form of a verbal expression, reduce the number of places of the underlying verbal predicate to the smallest number that will yield, with appropriate singular terms, a complete sentence. But do not think you have a complete sentence until you have discovered enough structure to validate all inferences you consider due to logical form. If 'There was a breaking' logically implies 'Something broke', give the first sentence the form 'There was a breaking *e* and an object *x* such that *e* was a breaking of *x*', not 'There was an *e* such that *e* was a breaking'. (1985, pp. 232f.)

One obvious difficulty with this approach is: how do we establish which inferences are due to logical form? Surely this is not an arbitrary matter. From our present perspective, indeed, Davidson must be charged with having got matters precisely on their head, for it seems that inferences of the given sorts are valid precisely in virtue of the ontology of the underlying dependence-structures (so that one could establish which inferences are valid only if one has established in advance what the latter are).

13. Cf. 1985, p. 232, though one may ask why Davidson accepts this view of apologies, given that he also accepts that the event of apologizing may be identical with a certain event of speaking (1980, p. 170).

## 7. Case Grammar

For Davidson, to repeat, events are individuals like any others, and the role they play within a semantic theory is simply to serve as elements in ordered *n*-tuples of various sorts. Yet as we have seen, an event and its bearer are not, like Dolores and Dagmar, merely contingently associated. An event is, as a matter of *necessity*, bound in its existence to the existence of its bearer, and this feature derives not from issues of logical form, but from the underlying ontology of the events themselves.

Many of the ideas presented above will be familiar to linguists from work on case grammar and on the valencies of verbs, e.g. on the part of Fillmore and his associates. The events referred to in sentences of natural languages are bound in different ways to substances or pluralities of substances, and linguists have obligingly provided us with catalogues of verb valencies setting forth precisely how verbs are associated in corresponding ways with noun-phrases and modifiers of associated sorts. My suggestion is that such catalogues be translated into ontological inventories that can serve as a stepping stone towards a theory of complex sentence-shaped truth-makers in which events play the central integrating role.<sup>14</sup>

The Fregean notion of unsaturatedness can be seen to incorporate an inkling of the sort of thing I have in mind. Some terms (and their ontological correlates) are, Frege tells us, necessarily in need of completion by other terms (and their ontological correlates). Certainly Frege held rather strange views as to the *results* of such completion: when the referent of 'smiles' is completed by the referent of 'Mary', for example, then what results is in his eyes not some portion of concrete (indeed in this case organic) reality, but a certain abstract object called a truth-value. Of course these strange views become wholly understandable in the light of Frege's functional reading of the nexus of saturation. But this reading led to an unfortunate running together – unfortunate for the whole of subsequent logic – of the saturated-unsaturated (independent-depend-

14. See e.g. Allerton 1982, Fillmore 1977, Slobin 1982 and also the work of Gestalt linguists such as Petitot and Wildgren.

ent) opposition with the opposition between what is individual and what is general.<sup>15</sup> From our present perspective, however – which builds on Davidson’s own incipient rejection of Frege’s confusion in the Davidsonian theory of events – we can once more draw these two (intuitively quite unrelated) oppositions apart. Events, we can say, enjoy specific types of unsaturatedness as *individuals*, in some ways analogous to the unsaturatednesses of the corresponding verbs – unsaturatednesses of just the sort that are catalogued in linguists’ dictionaries of valencies. An apologizing, for example, might be held to enjoy at least a twofold unsaturatedness in this sense, reflecting its need for completion by agent and patient. A kissing seems to enjoy a threefold unsaturatedness, since here a specific instrument is involved (at least in those cases reflected by literal uses of the word ‘kiss’): the agent’s lips. And even though this instrument is in every case a part of the agent, the underlying saturation- or dependence-structure is nevertheless a three-term affair, the event being linked to the agent as it were in two different ways. The truth-maker for ‘John kisses Mary’ is then not, as Davidson might be willing to suppose, an ordered triple (a certain sequence) consisting of John, a kiss and Mary in that order. It is a four-term dependence-structure in which the kiss is tied necessarily to the three remaining terms (John, Mary and John’s lips) as its bearers or carriers.

Taking the relevant dependence-relations into account, now, we can explain the quite special peculiarities of, say:

\*John kissed Mary *with his lips*,

as contrasted with, for example:

John kissed Mary against her will, while standing on a rock, with great gusto, etc.

15. It is another post-Russellian dogma that predicate-logical unsaturatedness is the only kind of unsaturatedness. It is from this that the conclusion is derived that adicity is the only kind of structure for events that is properly recognizable within one’s semantic theory.

Or consider also:

- \*John shot Mary *with a weapon*,
- \*John walked down the road *with his legs*,
- \*John buttered the toast *with butter*

These starred sentences seem odd from the point of view of their meaning in virtue of the fact that sentences like ‘John kissed Mary but not with his lips’ or ‘John kissed but there was nothing that he kissed’ are never literally true. It would be one way of passing our test for the adequacy of a theory of truth for sentences with empirical content if we were able to render explicable in a natural way the oddities involved in cases such as this.

### 8. *Topology of Truth-Makers*

To see how the theory of truth-makers as dependence-structures might go formally, let us return once more to the principle (PARTS). We let  $S$  be the set  $\{a_1, \dots, a_m\}$  of objects referred to in some true sentence  $p$ . We then impose a certain topological structure upon this set in a way that is designed to capture the manner in which the given objects are related together in reality as this is mapped by the given sentence. To this end we define the relation of *necessary existential dependence* as follows:

$\text{dep}(x, y) =_{\text{df}}$   $x$  is necessarily such that it cannot exist unless  $y$  exists.

(The relation hereby defined is then reflexive and transitive but not symmetric.<sup>16</sup>) We then define the *closure* of the set  $S$ ,

$\text{cl}(S) =_{\text{df}} \{y : \exists x(x \in S \wedge \text{dep}(x, y))\}$ .

16 There are a number of difficulties involved in providing a good account of this relation. (See the papers collected in Smith, ed., 1982, and ch. 8 of Simons 1987.) Suffice it here to point out that the relation we have in mind is most clearly illustrated in the relation which holds between an event and its bearer or bearers.

$cl(S)$  is intuitively speaking the set of all those entities which the elements of  $S$  require in order to exist. We shall say that  $S$  is closed if and only if  $S = cl(S)$  (being closed is comparable to being saturated in Frege's terms; alternatively it can be considered an ontological analogue of being categorematic). We shall then say that

$S$  is closed through  $a =_{df} S \text{ is closed} \wedge a \in S \wedge cl(\{a\}) = S$ .

Let us now see how these ideas can be applied to what is perhaps the simplest possible case, namely to a sentence containing just one verb such as 'hits', 'kisses' or 'apologizes'. Our task is to define the minimal truth-maker for a sentence such as this. Suppose, therefore, that the sentence is true, and that  $a$  is the event (of hitting, kissing, etc.) that is involved in making it true. Then there is some set  $S$ , which includes the set of *topics* of the given sentence, and which is closed through  $a$  (reflecting the fact that, as we might say, events do not walk alone, but require always to be accompanied by their bearers).

The minimal truth-maker for the sentence in question we can now define as the mereological fusion of the given set, which is (again under the assumption that the sentence is true and in virtue of the integrating role of  $a$ ) a unitary whole. Note that the whole in question must be many-sorted: for the relevant integration can be effected only if there is a certain heterogeneity among the objects referred to in a given sentence: a set of separate, homogeneous substances does not fuse in such a way as to form an integrated whole. As a sentence is not a heap of words, so its minimal truth-maker is not a heap of objects.

These considerations can now be used to throw light on a hitherto unnoticed puzzle raised by Davidson-like treatments of events as individuals. Consider, for example, a sentence like:

$\exists x \text{ Apologizes}(x, x, x)$

(roughly: an apology apologized to itself).

On the standard view, which recognizes no logically relevant difference between events and individuals of other sorts, such a sentence would be merely contingently false. Intuitively, however, it seems

clear that the falsehood with which we have to deal here is a necessary falsehood – a fact which the approach in terms of dependence-structures is able very neatly to explain. Since a killing is dependent upon a death, the approach suggested will be in a position to account also for the necessary falsehood of, say, 'Hans killed Mary but she did not die'. It tells us, in fact, that the predicate underlying 'kill' must include two event-places (one for a killing, another for a death), and that every dependence-structure verifying '--- killed Mary' must include a sub-structure verifying 'Mary died'.

## 9. Conclusion

We can summarize our view as follows: the region of reality with which we are properly in contact when we judge veridically using a simple empirical sentence is a dependence-structure of the sort outlined above.<sup>17</sup> Each true empirical logically simple sentence corresponds to a certain privileged region of reality: its minimal truth-maker. A sentence-shaped truth-maker on the view defended is not a sheer plurality,  $n$ -tuple, or set of objects. For in a plurality (and *a fortiori* in a set) there is nothing like the nexus of action, agent and patient (and similarly in regard to any of the other rather restricted number of canonical sentence-patterns case grammarians have distinguished).

Note that the individuals in a minimal truth-maker are, on the view suggested, reticulated together in just the way in which they are in any case reticulated together in the world. Moreover, while sentences are neatly demarcated one from another, no such tidy demarcation can be imputed to those regions of reality to which sentences correspond. Truth-makers, even minimal truth-makers, overlap; they are embrangled together. But now, by (SUPERORDINACY), we know further that each true empirical sentence corresponds also to all circumcluding regions, including reality as a whole. There is, therefore, for each true sentence, a tower of truth-makers ordered by the relation of mereological inclusion, a structure which,

17. In non-veridical cases, it might be said, we *attempt* to come into contact with such a truth-maker, but for one reason or another we fail in this attempt.

at least in simple cases, forms a complete lattice with maximal element reality as a whole. This, then, is the grain of truth in talk of the Great Fact; and it does much to explain also why classical forms of the correspondence doctrine, which sought some relation of similarity between sentence and (single) truth-maker, have so markedly failed to establish themselves in stable form.

## REFERENCES

- Allerton, D.J. (1982): *Valency and the English Verb*, London: Academic Press.
- Bunt, H. (1979): "Ensembles and the Formal Semantic Properties of Mass Terms", in F.J. Pelletier, ed., *Mass Terms. Some Philosophical Problems*, Dordrecht/Boston/London: Dordrecht, 249-277.
- Davidson, D. (1980): *Essays on Action and Events*, Oxford: Oxford University Press.
- Davidson, D. (1984): *Inquiries into Truth and Interpretation*, Oxford: Oxford University Press.
- Davidson, D. (1985): "Adverbs of Action", in B. Vermazen and M.B. Hintikka, eds., *Essays on Davidson. Actions and Events*, Oxford: Clarendon, 230-41.
- Dunn, M. (1976): "Intuitive Semantics for First Degree Entailments and 'Coupled Trees'", *Philosophical Studies*, 29, 149-168.
- Fillmore, C. (1977): "The Case for Case Reopened", in P. Cole and J. M. Sadock, eds., *Syntax and Semantics*, Amsterdam: North-Holland, 59-81.
- LePore, Ernest and McLaughlin, Brian P. (1985): *Actions and Events. Perspectives on the Philosophy of Donald Davidson*, Oxford: Blackwell.
- McCawley, James D. (1985): "Actions and Events Despite Bertrand Russell", in LePore and McLaughlin, eds., 177-192.
- Millikan, Ruth (1984): *Language, Thought and Other Biological Categories*, Cambridge, Mass.: MIT Press, Batsford Books.
- Mulligan, K., Simons, P.M. and Smith, B. (1984): "Truth-Makers", *Philosophy and Phenomenological Research*, 44, 287-321.

- Petitot, J. (1992): *Physique du Sens. De la théorie des singularités aux structures sémio-narratives*, Paris: Editions du CNRS.
- Simons, P.M. (1987): *Parts. An Essay in Ontology*, Oxford: Clarendon Press.
- Slobin, Dan (1982): "The Origin of Grammatical Encoding of Events", *Syntax and Semantics*, 15, 409-422.
- Smith, B. (1987): "On the Cognition of States of Affairs", in K. Mulligan, ed., *Speech Act and Sachverhalt: Reinach and the Foundations of Realist Phenomenology*, Dordrecht/Boston/Lancaster: Nijhoff, 189-225.
- Smith, B. (1989): "Constraints on Correspondence", in W. Gombocz, et al., eds., *The Tradition of Analytic Philosophy*, Vienna: Hölder-Pichler-Tempsky.
- Smith, B. (1991): "Relevance, Relatedness and Restricted Set Theory", in G. Schurz and G.J.W. Dorn, eds., *Advances in Scientific Philosophy. Essays in Honour of Paul Weingartner*, Amsterdam/Atlanta: Rodopi, 45-56.
- Smith, B. (ed.) (1982): *Parts and Moments. Studies in Logic and Formal Ontology*, Munich: Philosophia.
- Talmy, Leonard (1988): "Force Dynamics in Language and Cognition", *Cognitive Science*, 12, 49-100.
- Talmy, Leonard (1988a): "The Relation of Grammar to Cognition", *Topics in Cognitive Linguistics*. Brygida Rudzka-Ostyn, ed., Amsterdam: John Benjamins, 165-205.
- Wildgen, W. (1982): *Catastrophe Theoretic Semantics. An Elaboration and Application of René Thom's Theory*, Amsterdam: Benjamin.