

DISPOSITIONS AS INTENTIONAL STATES

by U.T.PLACE

Counterfactual States of Affairs

Armstrong begins his account of the dispute between us with the claim that it is common ground between us that to say

This glass is brittle

entails

If this glass had been suitably struck, then this striking would have caused the glass to shatter.

While not disputing this claim, it should be added that the statement 'This glass is brittle' also entails the prediction

If at any time in the future (so long as it remains brittle) this glass is suitably struck, then this striking will cause the glass to shatter.

Armstrong then says that there is a similar agreement between us

- that every true contingent statement requires the existence of some state of affairs or the occurrence of some event whose existence or occurrence makes the statement in question true (Martin's truthmaker principle)
- that, in the case of a counterfactual statement such as that entailed by 'This glass is brittle', there is no "counterfactual state of affairs" whose existence makes the statement true, and
- that, on the contrary, such statements are made true by the existence of some property of the entity or entities concerned.

On this view, the issue between us is a matter of whether the property or properties whose existence makes the statement true are categorical, as Armstrong holds, non-categorical, as held by Place, or part categorical and part non-categorical, as held by Martin.

From Place's standpoint this formulation dismisses rather too quickly the proposal that the "truthmaker" for a dispositional statement is "a counterfactual state of affairs." Armstrong describes a counterfactual state of affairs as

the state of affairs that if, contrary to fact, the glass had been suitably struck, then this striking would have caused the glass to break. On this view, the counterfactual *statement* has a form which pictures rather directly a certain portion of *reality*. (pp. 15-16)

This, I agree, is absurd.¹ What the counterfactual statement depicts is a *fictional* event (in which the glass is struck and caused to break) which is in no sense part of reality. But this is precisely the difference between a simple categorical statement of the *the cat is on the mat* variety and the case of counterfactuals, subjunctive conditionals, law statements, etc., where what the statement depicts and the actually existing state of affairs which makes the sentence true are two different things; necessarily so, because in these cases the event or state of affairs depicted does not exist, has not existed and may never exist, whereas *ex hypothesi* the state of affairs which makes the counterfactual true most certainly does.

The issue in dispute here concerns the interpretation of this state of affairs whose existence makes the counterfactual and subjunctive conditional true. On Place's view and, it would seem, on Martin's, the state of affairs that makes the counterfactual true is simply the possession by the entity in question (the glass) of the dispositional property or passive causal power of being shattered when struck sufficiently hard. On

Armstrong's view it is a categorical state of the microstructure of the entity that possesses the property. Neither Place nor Martin would deny the importance of the role played by the state of the microstructure here. But whereas for Armstrong the dispositional property and the state of the microstructure are one and the same thing, for Place the state of the entity whereby it possesses the dispositional property and the corresponding state of the microstructure are two distinct states of affairs, such that the state of affairs whereby the entity possesses the dispositional property stands as effect to the state of its microstructure as cause.

But if, as Place claims, the possession of a dispositional property and its basis in the microstructure are two distinct and causally related things rather than one and the same thing, in what does the possession of the dispositional property consist? On this Rylean² view, it is a matter, not of anything that is happening or is the case in the here and now, but of what would happen or, in the counterfactual case, would *have* happened, if certain conditions were to be or had been fulfilled.

If that is correct, there is nothing more to the truthmaker of a causal counterfactual than what may quite properly be called a 'counterfactual state of affairs', a state of affairs whereby certain predictions and counterfactual retrodictions of which the counterfactual in question is one are true of the owner of a dispositional property.

The 'Categorical/Non-Categorical' Distinction

Armstrong believes that the microstructural basis of a dispositional property is purely 'categorical'. It follows that, by identifying dispositional properties with their microstructural basis, he can represent dispositional properties as purely categorical, thereby eliminating the non-categorical from his ontology. Viewed from this standpoint, the contention that a dispositional property and its microstructural basis are two distinct entities such that the microstructure stands as cause to the possession by the bearer of the dispositional property as effect would seem to imply

- that dispositional properties are non-categorical, and
- that a non-categorical dispositional state stands as effect to a categorical state, the microstructure of the property owner, as cause.

However, this formulation misrepresents Place's position in two respects. It assumes, contrary to fact, that he accepts

- the reality of the distinction between 'categorical' and 'non-categorical' properties, and
- that, in so far as the distinction is a meaningful one, structural properties are purely categorical.

Place has two reasons for doubting the reality of the 'categorical/non-categorical' distinction as applied to properties:

- The primary application of the predicate 'categorical' is to statements, not to entities referred to in them.
- In so far as sense can be made of the predicate when used in this way, a 'categorical property' is one which consists entirely in what exists at the moment or period of time to which reference is made to the exclusion of anything that might exist or have existed at some other point in time. Place is inclined to doubt whether *any* property satisfies this definition.

In this latter respect Place's view is very close to the view which Armstrong attributes to Martin. If he differs from Martin it would be in the direction of questioning whether properties have *any* categorical aspect other than the fact that there is a currently existing prospect of something existing in the future, whether they are not otherwise wholly a matter of how things would or might turn out. On this view the only things that are 'purely categorical' are the existence of the property-bearer and the spatio-temporal relations between its parts and between it and other substances.

On this interpretation, what creates the illusion that there is something peculiarly 'categorical' about the microstructural basis of a dispositional property is the fact that the property bearer's possession of its microstructure involves *the existence of the parts* of which the microstructure is composed. But the 'categorical' existence of those parts is not a 'categorical property' of the property bearer, the whole whose parts they are. It is not just that, as Kant points out in his refutation of the Ontological Argument for the existence of God, existence is not a predicate, i.e., a property. The property bearer's possession of its

microstructure (which *is* a property), though it entails the existence of the parts is not 'a purely categorical property' in the relevant sense. For the property bearer's possession of its microstructure is not just a matter of what exists *now*. It is very much a matter of what might have existed in the past, but didn't, and may yet exist in the future.

Despite these reservations about the use which he makes of the distinction between 'categorical' and 'non-categorical' properties in his exposition of Place's position, it should be said that Armstrong is entirely right to suggest looking for the truthmaker for the counterfactual amongst the properties which an entity (such as the glass in his example) possesses and in diagnosing a difference between us over whether the property whose possession constitutes the truthmaker with respect to the counterfactual is categorical or non-categorical. For him, dispositional properties reduce to categorical properties of the microstructure. For Place and, perhaps, for Martin, dispositional properties are emergent³ properties of wholes which depend on, are partly explicable in terms of, but are *not* reducible to the parts composing the microstructure and *their* dispositional properties.

A Critique of Armstrong's Preliminary Statement

Armstrong begins his defence of "the view that things have categorical properties only (or have properties that are one-sided only and that side is categorical)" with the argument that this view leads to greater ontological economy in the spirit of Ockham's razor. It turns out, however, that in order to account for the counterfactual and subjunctive conditional entailments, he finds that these need to be deduced from a universal law statement; and *that* in turn requires a truthmaker in the form of a law of nature *qua* state of affairs in the world. So apart from the fact that his laws of nature *qua* states of affairs are likely to be fewer in number than the various states of affairs whereby certain counterfactual and subjunctive conditionals are true on the alternative account, his view is no more ontologically economical than its rival.

Indeed, unless he can succeed in collapsing laws of nature and universals all into one which, I suspect, he will find considerable difficulty in doing in a convincing fashion, the alternative conceptualist ontology seems likely to prove the more economical. Conceptualism, as advocated by Place, is Ockham's view which holds that all that exist are concrete particulars, their properties and the relations, including those of resemblance, between them. Universals, on this view, are generated by minds which abstract them from resemblances between particulars. They exist only in so far as they are used by minds to sort instances into classes. This ontology requires no laws of nature *qua* states of affairs over and above the possession by particulars of intentionally interpreted dispositional properties, no possible worlds and no universals over and above their instances and the classificatory propensities of human beings and other living organisms.

Armstrong's second argument for his position consists in an objection to the alternative position which, he claims, is committed to building a kind of intentionality that points at the non-actual into the constitution of the universe. This argument cuts no ice with Place. He finds nothing objectionable in the notion that intentionality *is* built into the very fabric of the universe. There are two reasons for this :

- He is persuaded by the arguments of Burnheim⁴ and Martin and Pfeifer⁵ that intentionality is not, as Brentano thought, the mark of the mental, but rather the mark of the dispositional.⁶
- He holds with Hume⁷ and Mackie⁸ that causal necessity is a matter of the truth of a counterfactual to the effect that if the cause had not occurred or been the case, the effect would not have occurred or been the case.

The conclusion that he draws from these two doctrines, when taken together, is that the intentionality of dispositional properties whereby, in Armstrong's words, they "point beyond themselves to what does not

exist" is, in Hume's phrase, the very "cement of the universe" without which there would be no causation, no change, no time, no space, no universe.

But even if we accept that there is something disreputable about building a pointing towards the non-actual into the fabric of the universe, it is a crime of which Armstrong himself is equally guilty. For what is he doing when he postulates laws of nature *qua* states of affairs corresponding to the universal law statements whose truth is demonstrated by empirical science, if not building a pointing towards the non-actual into the fabric of the universe? And if one is going to have pointings to the non-actual at the very heart of one's universe, is it not better that they should consist in the particular dispositional properties of particular concrete substances, rather than in a set of universal states of affairs which are linked to actual space-time only at the point of their otherwise unconnected instantiations?

Armstrong recognises that he is compelled to introduce the states of affairs which he refers to as "laws of nature" in order, as he puts it, to provide "an account of why we are nevertheless entitled to attribute unrealized powers, potentialities and dispositions to objects." However, he tries to persuade us that, by postulating independently existing universals and laws of nature *qua* states of affairs in the world, we can explain how it is that we are entitled to make predictions and retrodictions of how it would or would have behaved in circumstances which are either counterfactual or as yet unrealized, without postulating anything over and above the current existence of categorical states of affairs. In order to do that he has to persuade us that there is nothing disreputably non-categorical about universals and laws of nature *qua* states of affairs in the world. He seeks to do this by proposing

- to identify universals with actually instantiated and, presumably, categorical properties of some entity, and
- to identify laws of nature *qua* states of affairs in the world with relations between such properties.

Armstrong admits that, as described here, this does not add up to a fully worked out theory. He has discussed both laws of nature and universals extensively elsewhere.⁹ But, as it stands here, I submit, it doesn't even begin to address the problem.

In the first place, why restrict universals to properties and relations? Why can't there be - indeed don't there have to be on *any* account - universals in the category of substance, property-bearer types as well as property types, types of *relata* as well as types of relations?¹⁰ The suggestion that laws of nature be construed as relations between properties seems reasonable enough. But why should the properties have to be categorical? It seems that the Laws of Nature (here in the sense of linguistic/mathematical formulae devised by scientists) invariably involve causal relations between dispositional properties on the one hand and possible as well as actual events on the other. Ohm's Law, for example, describes a causal relation between two dispositional properties, the potential difference between two ends of a conductor and its resistance on the one hand and the magnitude of an event, the flow of current within it, on the other. Its purpose is to make possible predictions and retrodictions about non-actual current flows. But even if it is granted that the properties in question are to be construed as in some sense 'categorical', if the relation between those properties is a causal one, it follows, on the Hume/Mackie view of causation, that the relation itself involves the truth of a counterfactual. In other words causal relations on this view involve an essential non-categorical hypothetical element.

It looks suspiciously as though the talk of laws of nature being relations between 'categorical' properties is simply a ruse for smuggling in modality by the back door. The properties have to be categorical; but the relations between those properties can be as hypothetical, intentional or modal as you like.

Preliminary Statement of Place's Position

As already indicated, the alternative to Armstrong's position advocated by Place is a version of the traditional conceptualist theory of universals, discussed and rejected by Plato in the *Parmenides* (132-3), advocated, according to the best modern authorities¹¹, by Aristotle and following him by a line of medieval philosophers down to and including William of Ockham. According to this view, as interpreted here, everything that exists, everything that the universe contains, belongs to one or other of four basic categories. It is either

- a *concrete particular* (a physical object, entity or substance),
- a *feature of* (a property of or relation between) one or more *concrete particulars*, or
- a *situation* (event or state of affairs) whereby properties of or relations between two or more concrete particulars are located and extended in time.

- a *feature of* (a property of or relation between) one or more *situations*.¹²

On this view there are no independently existing abstract objects, such as numbers, universals, sets or laws of nature (considered as states of affairs in the world rather than as formulae describing what is common to the properties of and relations between concrete particulars). Nor do universals exist *in rebus*, in the particulars which instantiate them, as Armstrong holds, following Boethius' incorrect (as I would like to think) interpretation of Aristotle's view.¹³ According to the conceptualist, universals exist in two distinct senses:

1. in the sense that instances of them exist, and
2. in the sense that some living organism is disposed to classify some particulars in a certain way and, in the human case, in so far as that classification is incorporated in the semantic conventions of a particular natural language.¹⁴

Universals on this view are abstracted by animal and human minds on the basis of resemblances between concrete particulars, their features and the situations in which they are involved. A relation of resemblance exists between two or more particulars in so far as they both possess what, when viewed in the light of the system of universals incorporated in human language, is the same property or set of properties, though, needless to say, each possesses a different instance of that property.

On the view to which Armstrong subscribes, but about which, as we have seen, Place has some reservations, properties can be subdivided into

- *categorical properties*, such as the shape, size and material composition of a concrete particular, which do not extend beyond what is actually the case or actually happening at some moment in time, and
- *modal (dispositional) properties* which extend beyond what is actually happening or actually the case at some moment of time to what would happen or be the case, if certain contingencies should arise in the future or to what would have happened or been the case, if those contingencies had arisen in the past.

The possibility of reducing modal (dispositional) properties to categorical properties or of reducing modal (causal) relations to categorical (temporal) relations is denied by Place. It is accepted, however, that it is usually, if not invariably, possible to *explain* the existence of the dispositional properties of the whole in terms of

- the categorical relationship of its parts to one another, and
- the dispositional properties of the parts in their interaction with one another.

For reasons which have presumably to do with the fact that the existence of a relation presupposes the prior existence of the things between which the relation holds, Place's reservations concerning the application of the categorical/modal distinction to properties do not extend in the same way to its application to relations. Indeed, the suspicion that there may not be *any* genuine cases of categorical properties stems in part from the observation that the leading candidates for that status, the external shape and internal structure of a concrete particular, appear to reduce on analysis to spatial relations between the concrete particulars which make up the whole. But as well as categorical and modal relations between concrete particulars, there are categorical and modal relations between situations. Examples of categorical relations between concrete particulars are spatial relations and the genetic relations between individual organisms. Examples of modal relations between concrete particulars are the social relations between individual organisms of the same or different species. The modal character of such relations appears when we consider that they are a matter of the way the interactions between individuals are constrained both by their reciprocal dispositions and by those of others towards their relationship. In the case of relations between situations, it would seem to be a necessary truth both that all such relations are relations between the times at or over which the situations occur or exist, and also that all temporal relations are relations between situations. Temporal relations as such are categorical. A modal element is added when a causal relation is asserted between two consecutive events.

The motivation for this ontology derives from another aspect of Place's position. This is a version of the picture theory of the meaning of sentences which holds that there exists, in the case of any meaningful and non-analytic sentence, an isomorphic mapping relation between the structure of the sentence and the

structure of that segment of actual or prospective reality which it represents. Although the picture theory is usually associated with Wittgenstein's exposition of it in the *Tractatus*,¹⁵ it can be traced back to Aristotle's doctrine whereby the substance/property distinction in nature corresponds to the subject/predicate analysis of sentences. Apart from certain reservations about the possibility of adequately formalising the two halves of the isomorphism in the way they propose, the present version of the picture theory resembles the "Situation Semantics" proposed by Barwise and Perry¹⁶ from whom the term "situation", used for the extra-linguistic counterpart of the sentence, is derived. On this version of the theory, linguistic representations of extra-linguistic reality rely on a correspondence between the ontology described above and Frege's¹⁷ function and argument analysis of the structure of sentences which he introduced in place of the classical subject-predicate analysis in order to accommodate relational or multi-place predicates. Thus in a simple or atomic sentence like *The cat is on the mat*

- *concrete particulars* are represented by the noun phrases *the cat* and *the mat* occupying the argument places generated by the function (the verb phrase *is on*)
- *features of concrete particulars* are represented by the function or multi-place predicate expression (in this case the verb phrase *is on*),
- *situations* are represented by the complete simple sentence (*The cat is on the mat*), while
- *features of situations* are represented by compound sentences (e.g., *The cat is sitting on the mat without moving a muscle. It's irritating that the cat is always on the mat. Dawn has broken and the cat is on the mat. If the cat is on the mat, it will be fed.*)

It is a consequence of this version of the picture theory of the meaning of sentences that

- an imperative is complied with in so far as the listener creates a situation which *conforms to* that specified by the sentence,
- an indicative or declarative is contingently true in so far as there exists a situation which *corresponds to* that specified by the sentence.

It is also part of this view that we can distinguish, following Frege,¹⁸ between the sense (*Sinn*) of an expression and its referent (*Bedeutung*) in such a way that the sense of an expression is the kind of concrete particular, feature or situation which, if it existed, would constitute the referent of the expression in question. Equally, the referent of an expression is that actually existing concrete particular, feature or situation, or class of such actually existing concrete particulars, features or situations to which a speaker who uses the expression in question is able to draw the attention of a listener; provided, of course, that the listener understands the expression in the way prescribed by the conventions of the relevant language or code, and has the necessary background knowledge required to disambiguate the indexical and other purely referential aspects of the expression. It is a consequence of this view that if an indicative/declarative sentence expresses a synthetic/contingent statement and that statement is true, the sentence has a referent in the form of the actually existing situation which it specifies and whose existence makes the statement true.

The central issue in the present debate concerns the way in which that principle, the principle that for every true contingent statement there exists a situation which is both the referent and the truthmaker with respect to that statement, is to be applied in the case of dispositional statements (statements ascribing a dispositional property to a concrete particular). The problem arises because of the fact, which is not disputed, that dispositional statements, unlike statements ascribing a categorical property (or in-relation standing) to a concrete particular, entail a subjunctive/counterfactual conditional statement to the effect that if the concrete particular in question were to interact or had interacted with another concrete particular of a given kind, certain consequences would occur or fail to occur, or would have occurred or failed to occur.

These subjunctive/counterfactual conditionals which dispositional statements entail present two problems for the view that the truth of a contingent statement requires the existence of a situation which is both its referent and its truthmaker. These are

- the fact that we want to claim that the subjunctive/counterfactual conditional is true despite the fact that neither the situation specified by the antecedent of the conditional, nor that specified by the consequent, actually exists, and
- the fact that some of us, at least, are tempted to follow Ryle¹⁹ in claiming that to assert the relevant

subjunctive/counterfactual conditional is to assert all that is asserted by the superficially categorical assertion that the concrete particular in question possesses a particular modal/dispositional property; whereas the subjunctive/counterfactual apparently makes no existential claim, apart from the implied existence of the concrete particular in question.

Both problems are dealt with on the present view by proposing that the claim that the subjunctive/counterfactual conditional is true can only be sustained in so far as there exists or existed at the relevant time an actual state of the concrete particular in question such that the subjunctive/counterfactual is true.

This state of the concrete particular exists and is both the referent of the subjunctive/counterfactual conditional statement as a whole (as distinct from its parts which have no referent) and its truthmaker. It is not, however, as Armstrong believes, the same state of affairs as the state of the microstructure of the concrete particular in question on whose existence, on this view, it depends in a causal sense. For although the existence of the state of the microstructure is the ultimate truthmaker for the subjunctive/counterfactual conditional, in the sense that it stands as cause to the immediate truthmaker, the dispositional property, as effect, it is not the state of affairs to which that statement refers.

There are two arguments which favour the view that dispositional states and the corresponding state of the microstructure are two distinct and causally related states rather than two descriptions of one and the same state. The first argument we may call "the argument from ordinary usage"; while the second argument may be described as "the epistemological argument."

The argument from ordinary usage may be illustrated by contrasting a typical dispositional state such as an engine's having a certain horsepower with a state of the engine's microstructure such as the cubic capacity of its cylinders. It is true that quoting the engine's horsepower and quoting the cubic capacity of its cylinders are, for some purposes, alternative ways of indicating how powerful the engine is; but, as we ordinarily understand the matter, to say that an engine's cylinders have a certain cubic capacity is not to say the same thing about it as saying that it has a certain horsepower. It would seem more natural to say that the cubic capacity of the engine's cylinders is one amongst a number of features of the engine's microstructure on which the horsepower it regularly produces, or is capable of producing under standard conditions of operation, depends in a causal sense. And, as Hume has taught us, causal relations hold only between distinct existences. Hence, a dispositional property and its microstructural basis are two things, not one.

The epistemological argument consists in pointing out that the way we ascertain the state of the microstructure of a concrete particular is quite different from the way in which we determine the corresponding dispositional state. We ascertain the state of the microstructure of a concrete particular by taking it apart and examining its parts, where necessary and feasible, by means of a microscope. We determine the corresponding dispositional state by subjecting the concrete particular in question, or a specimen similar to it in all relevant respects, to an appropriate test. In such a test the conditions specified in the antecedent of the conditional are fulfilled, so that the consequence specified in the consequent can be compared with what actually happens. It is contended that this epistemological difference is unintelligible on the assumption that both procedures serve to ascertain the existence of the same state.

NOTES

1. Armstrong suggests that it is implausible rather than absurd.
2. G. Ryle *The Concept of Mind*, London, Hutchinson, 1949, pp. 121-135.
3. An emergent property is simply a property of a whole which a mere collection of parts does not possess. An engine, for example, has a horsepower. A collection of parts which when assembled correctly form an engine does not.
4. J. Burnheim 'Intentionality and materialism', unpublished paper presented to the Department of Philosophy, University of Sydney, c.1969.
5. C.B. Martin, and K. Pfeifer, 'Intentionality and the non-psychological'. *Philosophy and Phenomenological Research*, 1986, XLVI, 531-554.
6. This statement needs some qualification in the light of the distinction drawn by the late Professor William Kneale (*Proceedings of the Aristotelian Society, Supplementary Volume XLII*, 1968, 73-90) between Intentionality (spelt-with-a-t) which is a property of extra-linguistic and, as it now turns out, dispositional states, and Intensionality (spelt-with-an-s) which is a property of linguistic expressions (typically noun phrases and embedded sentences in the direct or indirect object argument place). Once this distinction is drawn, it becomes apparent that it is only intentionality (spelt-with-a-t) that is the mark of the dispositional. Intensionality (spelt-with-an-s) coincides with Frege's "indirectly referring" and Quine's "referentially opaque" expressions which arise when a phrase or sentence is used to quote what someone has said or might be expected to say. See U.T. Place 'Intentionality as the mark of the dispositional', *Dialectica* 50, 1996, fasc. 2.
7. D. Hume *An Enquiry Concerning Human Understanding*, Section VII, Part II, Paragraph 60.
8. J.L. Mackie, 'Counterfactuals and causal laws' in R.J. Butler (ed.) *Analytical Philosophy*, Oxford: Blackwell, 1962, pp. 66-80. and J.L. Mackie *The Cement of the Universe*, London, OUP, 1974.
9. See D.M. Armstrong, *What is a Law of Nature?* Cambridge: Cambridge University Press, 1983 and *Universals: An Opinionated Introduction*, Boulder, Colorado, Westview Press, 1989.

-
10. Though this would not seem to be issue between the participants in this debate, it is perhaps worth pointing out that universals in the category of substance, or "second substances" as Aristotle calls them, are universals such as 'human being', 'tree' and 'pile of stones', kinds of entity whose instances are extended, within determinate limits, in three dimensions of space and one of time. Instances of these universals, Aristotle's "primary substances", are the bearers of properties, whether these are thought of as property instances (tropes) or as property universals; but it is a mistake to suppose that predicates such as 'is a human being', 'is a tree' or 'is a pile of stones' stand for properties of the object of which they are predicated. Their function is rather to specify the substance universals under which those objects fall. They specify properties only insofar as there are properties which are essential to being a substance of that kind.
 11. See A.C. Lloyd *Form and Universal in Aristotle*, Liverpool, Cairns, 1981 and M. Frede and G. Patzig *Aristoteles 'Metaphysik Z': Text, Übersetzung und Kommentar*, 2 Vols, München, Beck, 1988.
 12. There are also features of features, where the features of which the former are features can be features either of situations or of concrete particulars. For example, syntactic relations within a sentence are relations between words; and words consist in certain formal properties of either an event (a vocal utterance) or a concrete particular (marks on paper). I have not listed features of features as a separate category, however, since things like words, sounds, shadows and rainbows are treated in language as if they were concrete particulars, and their features as if they were features of such particulars.
 13. See W. Kneale and M. Kneale *The Development of Logic*, Oxford, Clarendon Press, 1962, p. 196.
 14. The timescale over which a universal can be said to exist in these two different senses is often very different. Assuming that current theories are correct, the universal 'quark' has had instances and has thus existed in sense 1 ever since the 'big bang'. But in sense 2, i.e., considered as a concept, it has existed for little more than thirty years at the time of writing.
 15. L. Wittgenstein 'Tractatus logico-philosophicus' *Annalen der Naturphilosophie*, 1921. As *Tractatus Logico-philosophicus* with second English translation by D.F. Pears and B.F. McGuinness, London, Routledge and Kegan Paul, 1961.
 16. J. Barwise and J. Perry. *Situations and Attitudes*. Cambridge, MA: M.I.T. Press, 1983.
 17. G. Frege, *Begriffsschrift*, 1879. English translation by P.T. Geach, in P.T. Geach & M. Black (eds.) *Translations from the Philosophical Writings of Gottlob Frege*, Oxford, Blackwell, 1952.
 18. G. Frege, 'Über Sinn und Bedeutung', *Zeitschrift für Philosophie und philosophische Kritik*, 1892, 100: 25-50. English translation as 'On sense and reference' by M. Black. In P.T. Geach and M. Black (eds.) *Translations from the Philosophical Writings of Gottlob Frege*. Oxford: Blackwell, 2nd Edition, 1960.
 19. *op.cit.* pp. 127-128.